2018 ANNUAL REPORT

ribbon™

Dear Stockholders,

I am pleased to invite you to attend the annual meeting of stockholders of Ribbon Communications Inc. on Wednesday, June 5, 2019. Our meeting will be held at 10:00 a.m. Eastern Daylight Time at the offices of Latham & Watkins LLP, located at 200 Clarendon Street, Boston, MA 02116.

As Ribbon's President and Chief Executive Officer, I am dedicated to driving long-term stockholder value. The Company seeks to achieve sustainable performance that creates value through the right business strategies, prudent management and cost discipline, well-functioning talent management and effective corporate governance.[1] I appreciate this opportunity to address our stockholders and would like to highlight a few areas of particular significance for Ribbon this past year.

2018 – A Year of Transformation

I am pleased with the Company's progress during 2018. We exceeded our strategic and financial objectives while substantially completing the integration of two former industry-leading companies into one cohesive, global software business. The Company continued to successfully execute against our four strategic pillars of (1) investing in our core products, (2) broadening our solutions offerings to our global installed base, (3) expanding into adjacent markets and (4) achieving scale through acquisitions, alliances and organic growth. We brought new, innovative real-time communications software products to the market and streamlined our existing product portfolio, while more than doubling the adjusted EBITDA profitability of our company from the prior year.

We extended our leadership in virtualized software solutions and expanded our addressable enterprise market. In August, Ribbon acquired Edgewater Networks and, in combination with our organic session software products, we were recognized as the market share leader in enterprise session border controllers during the third quarter of 2018 by leading market research firm IHS Markit. Furthermore, the Company was subsequently recognized as having the largest total market share for session border controllers for the fourth quarter of 2018 by independent market research firm Exact Ventures, with a 20 percent revenue market share. I am pleased that our investment in the higher-growing enterprise market is driving increased adoption of our session software solutions by enterprises from all market sectors as they evolve and modernize their data and voice network capabilities.

We continued to build strategic relationships with existing Tier 1 global service providers and large enterprises while investing in and expanding our software-based solutions portfolio. The Company strengthened partnerships with leading cloud providers and software vendors which further reinforced our ability to deliver the digital software solutions that our customers are demanding.

Some 2018 highlights included:

- We deployed a virtualized, software-based Session Border Controller as a Service (SBCaaS) solution with Verizon. The Verizon SBCaaS, powered by Ribbon, enables enterprises to dynamically respond to seasonal demands in a truly elastic operating expense model, helping them better manage their costs, adjust to changing business needs, and reduce their reliance on dedicated network hardware and potential points of network failure.
- Our industry-leading virtualized session software solution – known as the SWe product – now has over 1,500 systems deployed at customers ranging from Tier 1 service providers to medium-sized enterprises.

- We successfully brought to market our next-generation security and analytics software platform, Ribbon Protect. The solution is fully operational at a Tier 1 service provider in Japan – Softbank – and also deployed in numerous other carrier and enterprise customers.
- Our market-leading session border controllers were selected by Microsoft as one of two vendors to deliver secure, integrated voice services from Office 365's newest offering, Microsoft Direct Routing for Teams.
- We completed one of the largest VoIP (Voice over Internet Protocol) deployments in the U.S. Department of Defense's history, migrating more than 60,000 users to our Joint Interoperability Test Command (JITC)-certified Unified Communications (UC) technology.
- We also entered into an agreement with the City of Los Angeles, which includes more than 40 departments and 50,000-plus employees, to upgrade the city's UC capabilities and voicemail system with our Kandy cloud software, replacing its legacy PBX and key systems with state-of-the-art, cloud-based Kandy Unified Communications-as-a-Service (UCaaS) capabilities.
- We continued to make progress on various significant deployments of our network interconnect solutions. We currently have billions of minutes of mobile traffic per month running on these solutions in large service provider networks.

Environmental, Social and Corporate Governance

We are dedicated to serving our customers and the communities in which we operate. Fulfilling this commitment dictates that we build a vibrant, innovative organization that satisfies our customers' needs and delivers value to our stockholders. Effectively addressing environmental, social and governance issues is a key part of building long-term stockholder value. We seek to maintain sound business practices that are designed to earn customer trust and support and maintain the highest level of legal and ethical conduct on the part of our employees, are respectful to our employees and to reward them for their hard work, ingenuity and creativity, and minimize the impact of our business on the environment.

Looking Forward to 2019

Ribbon is a leader in enabling network modernization through next generation software, and we plan to continue to invest in our software solutions platform approach to increase our global reach and scale. We aim to enable service providers and enterprises to significantly expand their software-enabled real-time communications (RTC) environments to provide better, more agile end-customer experiences that contain their operational and capital expenditure costs. By doing so, we believe we will sustain our industry-leading position and succeed in our market.

The Company entered 2019 with a much stronger software product line-up, numerous new market opportunities and long-term earnings momentum. Our industry is evolving quickly toward more complete end-to-end software solutions, which we believe will bring both additional opportunities and challenges. Our customers are facing new competitors and expect more agility and innovation from us. We have the next generation software products, relationships, worldwide distribution and the financial resources to meet these expectations and help our customers maintain and increase their dominance in the RTC value chain.

Even as we continue to operate in a very difficult and competitive environment, we feel we are well positioned from a leadership, employee, solutions and support perspective to capitalize on the market opportunities before us and to continue the excellent momentum we established in 2018 by delivering value to our customers, partners and stockholders.

Thank you for your continued support.

Best regards,

Franklin (Fritz) Hobbs
President and Chief Executive Officer

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[1] Please refer to the inside back cover for Important Information Regarding Forward-Looking Statements.

Proxy Statement

RIBBON COMMUNICATIONS INC.
4 Technology Park Drive
Westford, MA 01886

April 25, 2019

Dear Fellow Stockholders:

We cordially invite you to the annual meeting of stockholders at 10:00 a.m. on Wednesday, June 5, 2019, at the offices of Latham & Watkins LLP, located at 200 Clarendon Street, Boston, MA 02116. We look forward to personally greeting those stockholders who are able to be present at the meeting. However, whether or not you plan to attend in person, it is important that your shares be represented and voted at the annual meeting. Therefore, I urge you to promptly vote and submit your proxy by signing, dating, and returning the enclosed proxy card in the enclosed envelope, which requires no postage if mailed in the United States, or provide voting instructions to your broker, bank or other nominee. If you decide to attend the annual meeting, you will be able to vote in person, even if you have previously submitted your proxy. Every stockholder's vote is important.

Thank you very much for your continued trust and confidence in Ribbon. Please remember to vote your shares at your earliest convenience.

Sincerely,

Franklin (Fritz) W. Hobbs
President and Chief Executive Officer

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS OF
RIBBON COMMUNICATIONS INC.

Place:
Latham & Watkins LLP
200 Clarendon Street
Boston, MA 02116

Date:
June 5, 2019

Time:
10:00 a.m. Eastern time

AGENDA

- Election of eight directors named in the Proxy Statement
- Approval of the Ribbon Communications Inc. 2019 Incentive Award Plan
- Ratification of the appointment of Deloitte & Touche LLP as Ribbon Communications' independent registered public accounting firm for 2019
- Approval, on a non-binding advisory basis, of the compensation of our named executive officers
- Transaction of other business, if any, as may properly come before the meeting or any adjournment, continuation or postponement thereof

Record Date: You can vote at, and are entitled to notice of, the annual meeting if you were a stockholder of record on April 15, 2019.

If you are attending the meeting, you will be asked to present a valid, government-issued photo identification, such as a driver's license, as described in the Proxy Statement.

By Order of the Board of Directors,

Justin K. Ferguson
Executive Vice President, General Counsel and
Corporate Secretary

Westford, Massachusetts
April 25, 2019

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CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

The accompanying Proxy Statement contains "forward-looking statements" within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which are subject to a number of risks and uncertainties. All statements other than statements of historical fact contained in the accompanying Proxy Statement, including statements regarding our future results of operations and financial position, business strategy, plans and objectives of management for future operations and plans for future product development and manufacturing, are forward-looking statements. Without limiting the foregoing, the words "anticipates", "believes", "could", "estimates", "expects", "intends", "may", "plans", "seeks", "projects", "will" and other similar language, whether in the negative or affirmative, are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various factors, including, but not limited to: our ability to realize benefits from acquisitions; the effects of disruptions resulting from acquisitions, making it more difficult to maintain relationships with employees, customers or business partners; the timing of customer purchasing decisions and our recognition of revenues; economic conditions; our ability to recruit and retain key personnel; difficulties supporting our strategic focus on channel sales; difficulties retaining and expanding our customer base; difficulties leveraging market opportunities; the impact of restructuring and cost-containment activities; litigation; actions taken by significant stockholders; difficulties providing solutions that meet the needs of customers; market acceptance of our products and services; rapid technological and market change; our ability to protect our intellectual property rights; our ability to maintain partner, reseller, distribution and vendor support and supply relationships; higher risks in international operations and markets; the impact of increased competition; increases in tariffs, trade restrictions or taxes on our products; currency fluctuations; changes in the market price of our common stock; and/or failure or circumvention of our controls and procedures. Important factors that could cause actual results to differ materially from those in these forward-looking statements are discussed in the "Risk Factors", "Management's Discussion and Analysis of Financial Condition and Results of Operations", and "Quantitative and Qualitative Disclosures About Market Risk" sections in our Annual Report on Form 10-K/A for the year ended December 31, 2018 and our other filings with the U.S. Securities and Exchange Commission. Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. We therefore caution you against relying on any of these forward-looking statements. Also, any forward-looking statement made by us in the accompanying Proxy Statement speaks only as of the date of the accompanying Proxy Statement. Factors or events that could cause our actual results to differ may emerge from time to time, and it is not possible for us to predict all of them. We undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.

RIBBON COMMUNICATIONS INC.
PROXY STATEMENT

Summary Information

To assist you in reviewing the proposals to be acted upon at our 2019 annual meeting of stockholders (the "**2019 Annual Meeting**"), Ribbon Communications Inc. would like to call your attention to the following information about Ribbon's 2018 financial performance, key executive compensation actions and decisions, and corporate governance highlights. Please note that the following description is only a summary. For more complete information about these topics, please review our Annual Report on Form 10-K/A for the year ended December 31, 2018 (the "**2018 Annual Report**") and this proxy statement ("**Proxy Statement**"). This Proxy Statement and our 2018 Annual Report will be mailed to our stockholders of record on or about April 25, 2019.

Effective October 27, 2017, we completed the merger (the "**Merger**") of Sonus Networks, Inc. ("**Sonus**"), GENBAND Holdings Company, GENBAND, Inc. and GENBAND II, Inc. (collectively, "**GENBAND**"). Because the Merger occurred on October 27, 2017, the information reported in this Proxy Statement for the period prior to that date principally relates to Sonus, our predecessor entity. Unless the content otherwise requires, references in this Proxy Statement to "Ribbon," "Ribbon Communications," "Company," "we," "us" and "our" and "the Company" refer to (i) Sonus and its subsidiaries prior to the Merger and (ii) Ribbon Communications Inc. and its subsidiaries upon closing of the Merger, as applicable.

Business Overview

We are a leading provider of next generation software solutions to telecommunications, wireless and cable service providers and enterprises across industry verticals. With over 1,000 customers around the globe, including some of the largest telecommunications service providers and enterprises in the world, we enable service providers and enterprises to modernize their communications networks through software and provide secure real-time communications solutions to their customers and employees. By securing and enabling reliable and scalable Internet Protocol ("**IP**") networks, we help service providers and enterprises adopt the next generation of software-based virtualized and cloud communications technologies for service providers to drive new, incremental revenue while protecting their existing revenue streams. Our software solutions provide a secure way for our customers to connect and leverage multivendor, multiprotocol communications systems and applications across their networks and the cloud, around the world and in a rapidly changing ecosystem of IP-enabled devices, such as smartphones and tablets. In addition, our software solutions secure cloud-based delivery of unified communications ("**UC**") solutions—both for service providers transforming to a cloud-based network and for enterprises using cloud-based UC. We sell our software solutions through both direct sales and indirect channels globally, leveraging the assistance of resellers, and we provide ongoing support to our customers through a global services team with experience in design, deployment and maintenance of some of the world's largest IP software networks.

We completed our acquisition of Edgewater Networks, Inc., a market leader in Network Edge Orchestration for the distributed enterprise and UC market, on August 3, 2018, making us a software market leader in enterprise Session Border Controllers and allowing us to extend Edgewater software solutions internationally while expanding our cloud offerings and entering the SD-WAN market. In addition, on February 28, 2019, we acquired the business and technology assets of Anova Data, Inc., a provider of advanced analytics solutions, to reinforce and extend our strategy to expand into network optimization, security and data monetization via big data analytics and machine learning.

2018 Financial Highlights

- GAAP total revenue was $577.9 million, compared to $329.9 million in 2017.
- Non-GAAP total revenue was $612.0 million, compared to $353.2 million in 2017.
- GAAP net loss was $76.8 million, compared to $35.3 million in 2017.
- GAAP loss per share was $0.74, compared to $0.60 in 2017.
- Non-GAAP diluted earnings per share was $0.58, compared to $0.51 in 2017.
- Non-GAAP Adjusted EBITDA was $84.0 million, compared to $40.9 million in 2017.

Please see the reconciliation of non-GAAP to GAAP financial measures, and additional information about non-GAAP measures, in ***Appendix A***.

Executive Compensation Highlights

In 2018, we engaged in a thorough review of our compensation programs and practices in connection with the establishment of a unified Ribbon executive compensation program for our executive officers. We believe that the new program's adoption has established a strong foundation to support the continued growth of our business and the attainment of key synergies and other goals of our business. The ongoing compensation programs and practices are governed by effective and strong pay practices as set forth below.

What We Do

- ✔ Strong pay-for-performance philosophy
- ✔ Independent compensation committee and compensation consultant
- ✔ Annual market-based review of compensation levels and peer groups
- ✔ Annual risk assessment of compensation plans and policies
- ✔ Share ownership guidelines for our executives and board members
- ✔ Formal clawback policy with respect to incentive compensation
- ✔ Insider trading policy that prohibits hedging and other similar actions by our executive officers and directors

What We Don't Do

- ✘ No gross-up provisions
- ✘ No pension plans or other post-employment benefit plans
- ✘ No base pay severance multipliers in excess of two
- ✘ No multi-year guaranteed incentive awards for executives
- ✘ No liberal share recycling

Board of Directors and Committees

Name, Age	*Independent*	*Director Since*	*Committee Membership*	*Other Public Boards*
Kim S. Fennebresque, 69	Yes	October 2017	• Compensation Committee (Chair) • Nominating and Corporate Governance Committee (Chair)	3
Bruns H. Grayson, 71	Yes	October 2017	• Audit Committee • Compensation Committee	1
Franklin (Fritz) W. Hobbs, 71	No	October 2017		2
Beatriz V. Infante, 65	Yes	January 2010	• Audit Committee • Compensation Committee	2
Richard J. Lynch, 70	Yes	February 2014	• Chairman of the Board • Nominating and Corporate Governance Committee	2
Kent J. Mathy, 59	Yes	October 2017		1
Scott E. Schubert, 65	Yes	February 2009	• Audit Committee (Chair, ACFE*) • Nominating and Corporate Governance Committee	0
Richard W. Smith, 66	No	October 2017		0

* ACFE—Denotes that Mr. Schubert is an "audit committee financial expert" as defined in Item 407(d)(5) of Regulation S-K.

Annual Meeting Proposals

Proposal	*Recommendation of the Board*
Election of eight directors named in this Proxy Statement	FOR each of the nominees
Approval of the Ribbon Communications Inc. 2019 Incentive Award Plan	FOR
Ratification of the appointment of auditors	FOR
Approval, on a non-binding, advisory basis, of the compensation of our named executive officers	FOR

INFORMATION ABOUT THE ANNUAL MEETING

Our Board of Directors (our "**Board**") is soliciting proxies for the annual meeting of stockholders of Ribbon to be held on Wednesday, June 5, 2019, and at any adjournments, continuations or postponements thereof. This Proxy Statement contains important information for you to consider when deciding how to vote on the matters brought before the meeting. Please read it carefully.

Important Notice Regarding Availability of Proxy Materials for the Stockholder Meeting to be held on June 5, 2019: This Proxy Statement and the 2018 Annual Report to Stockholders are available for viewing, printing and downloading at *www.proxyvote.com*.

Why am I receiving these materials?

You have received these proxy materials because our Board is soliciting your vote at the 2019 Annual Meeting. This Proxy Statement includes information that we are required to provide to you under the rules of the U.S. Securities and Exchange Commission (the "**SEC**") and that is designed to assist you in voting your shares.

When and where is the meeting?

The 2019 Annual Meeting will be held on Wednesday, June 5, 2019 at 10:00 a.m., Eastern time, at the offices of Latham & Watkins LLP, located at 200 Clarendon Street, Boston, Massachusetts 02116.

Who may vote at the meeting?

Stockholders of record at the close of business on April 15, 2019, the record date, or holders of a valid proxy, may attend and vote at the meeting. Each stockholder is entitled to one vote for each share of common stock held on all matters to be voted. As of the close of business on April 15, 2019, an aggregate of 111,390,821 shares of our common stock were outstanding, including 867,834 unvested shares of restricted stock. A list of our stockholders will be available for inspection at our corporate offices at 4 Technology Park Drive, Westford, Massachusetts 01886, beginning no less than ten days prior to the meeting.

How many shares must be present to hold the meeting?

A majority of the 111,390,821 shares of our common stock that were outstanding as of the record date must be present at the meeting in order to hold the meeting and conduct business. This is called a quorum. For purposes of determining whether a quorum exists, we count as present any shares that are properly represented in person at the meeting or that are represented by a valid proxy properly submitted over the Internet, by telephone or by mail. Further, for purposes of establishing a quorum, we count as present shares that a stockholder holds and that are represented by their proxy even if the stockholder does not vote on one or more of the matters to be voted upon. If a quorum is not present at the scheduled time of the 2019 Annual Meeting, the chairperson of the meeting is authorized by our by-laws to adjourn the meeting, without the vote of stockholders.

What proposals will be voted on at the meeting?

There are four proposals scheduled to be voted on at the meeting:

- The election of the eight nominees for director named in this Proxy Statement to hold office until the 2020 annual meeting of stockholders of the Company (the "**2020 Annual Meeting**") (Proposal 1);
- The approval of the Ribbon Communications Inc. 2019 Incentive Award Plan (Proposal 2);
- The ratification of the appointment of Deloitte & Touche LLP to serve as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2019 (Proposal 3); and
- The approval, on a non-binding, advisory basis, of the compensation of our named executive officers (Proposal 4).

How does the Board of Directors recommend that I vote?

Our Board recommends that you vote your shares:

- "For" the election of each of the nominees to our Board named in this Proxy Statement (Proposal 1);
- "For" the approval of the Ribbon Communications Inc. 2019 Incentive Award Plan (Proposal 2);
- "For" the ratification of the appointment of Deloitte & Touche LLP to serve as our independent registered public accounting firm for the fiscal year ending December 31, 2019 (Proposal 3); and
- "For" the approval, on a non-binding, advisory basis, of the compensation of our named executive officers (Proposal 4).

What vote is required to approve each matter and how are votes counted?

Election of Directors (Proposal 1). In an uncontested election, such as the election of directors at the 2019 Annual Meeting, to be elected, each of the nominees for director must receive more votes "For" such nominee's election than "Against" such election (with abstentions and broker non-votes not counted as a vote for or against). With respect to each nominee, you may vote "For," "Against," or "Abstain." Abstaining will have no effect on the outcome of the election.

Approval of Our 2019 Incentive Award Plan (Proposal 2). The affirmative vote of a majority of the shares of common stock present or represented at the 2019 Annual Meeting and entitled to vote on this proposal will be required to approve this proposal. You may vote "For," "Against", or "Abstain" from voting on this proposal. Abstaining from voting on this proposal will have the effect of a vote against the approval of this proposal.

Ratification of the Appointment of Deloitte & Touche LLP to Serve as the Company's Independent Registered Public Accounting Firm for the Fiscal Year Ending December 31, 2019 (Proposal 3). The affirmative vote of a majority of the shares of common stock present or represented at the 2019

Annual Meeting and entitled to vote on this proposal will be required to approve this proposal. You may vote "For", "Against", or "Abstain" from voting on this proposal. Abstaining from voting on this proposal will have the effect of a vote against this proposal.

Approval, on a Non-Binding, Advisory Basis, of the Compensation of Our Named Executive Officers (Proposal 4). The vote on the compensation of the named executive officers is non-binding, as provided by law. However, our Board and its Compensation Committee will review and consider the outcome of this vote when making future compensation decisions for our named executive officers. The affirmative vote of a majority of the shares of common stock present or represented at the 2019 Annual Meeting and entitled to vote on this proposal will be required to approve this proposal. You may vote "For", "Against", or "Abstain" from voting on this proposal. Abstaining from voting on this proposal will have the effect of a vote against this proposal.

For the proposals relating to the election of directors (Proposal 1), the approval of our 2019 Incentive Award Plan (Proposal 2), and the approval, on a non-binding, advisory basis, of the compensation of our named executive officers (Proposal 4), please note that if you are a beneficial owner of our common stock and your stock is held through a broker, bank or other nominee (in "street name"), under stock exchange rules a broker, bank or other nominee subject to those rules is not permitted to vote your shares on these three proposals without your instruction. Therefore, if a beneficial owner of our common stock fails to instruct such a broker, bank or other nominee how to vote on Proposals 1, 2 and 4, that beneficial owner's shares cannot be voted on these matters—in other words, your broker, bank or other nominee's proxy will be treated as a "broker non-vote," which is explained in the following question and explanation.

What are broker non-votes and what is the effect of broker non-votes?

Brokers, banks and other nominees have the discretion to vote shares held in "street name"—a term that means the shares are held in the name of the broker, bank or other nominee on behalf of its customer, the beneficial owner—on routine matters, such as the ratification of the appointment of our independent registered public accounting firm, but not on non-routine matters. Generally, broker non-votes occur when shares held by a broker, bank or other nominee for a beneficial owner are not voted with respect to a non-routine matter because the broker, bank or other nominee has not received voting instructions from the beneficial owner and the broker, bank or other nominee lacks discretionary authority to vote the shares because of the non-routine nature of the matter. The election of directors (Proposal 1), the approval of our 2019 Incentive Award Plan (Proposal 2), and the approval, on a non-binding, advisory basis, of the compensation of our named executive officers (Proposal 4) are "non-routine" matters for which brokers, banks and other nominees, under applicable stock exchange rules, may not exercise discretionary voting power without instructions from the beneficial owner, and therefore broker non-votes will not affect the outcome of the vote on these proposals. The ratification of the appointment of our independent registered public accounting firm (Proposal 3) is a "routine" matter for which brokers have discretionary authority to vote. Therefore, we do not expect any broker non-votes in connection with this proposal. Broker non-votes are counted as shares present for purposes of determining the presence of a quorum. Your vote is very important, whether you hold directly or through a broker, bank or other nominee. We encourage you to read this Proxy Statement and the 2018 Annual Report carefully and if you are a beneficial owner, please be sure to give voting instructions to your broker, bank or other nominee.

What happens if an incumbent director nominee fails to receive more "For" votes than "Against" votes?

Our Corporate Governance Guidelines require that as a condition to being nominated by the Board for re-election as a director, each incumbent director must deliver to the Board an irrevocable resignation from the Board that will become effective if, and only if, both (i) in the case of an uncontested election, such nominee does not receive more votes "For" his or her election than votes "Against" such election, and (ii) the Board accepts such resignation. The Board will decide (based on the recommendation of a committee of the Board) whether to accept the director's resignation within 90 days after the election results are certified.

An incumbent director who does not receive the required vote in an uncontested election will continue to serve as a director while the Nominating and Corporate Governance Committee and the Board decide whether to accept or reject such director's resignation. If the Board accepts such resignation, the Board may fill the remaining vacancy or may decrease the size of the Board in accordance with our by-laws. Our Corporate Governance Guidelines are posted on our website at *www.ribboncommunications.com.*

How can I vote my shares in person at the meeting?

Shares held directly in your name as the stockholder of record may be voted in person at the meeting. If you choose to attend the meeting, please bring the enclosed proxy card and a valid, government-issued photo identification, such as a driver's license, for entrance to the meeting.

If you hold your shares in street name, please bring the enclosed voting instruction form you received from your broker, bank or other nominee and proof of identification for entrance to the meeting. You must also request a legal proxy from your broker, bank or other nominee and bring it to the 2019 Annual Meeting if you would like to vote at the meeting.

How can I vote my shares without attending the meeting?

If you are a stockholder of record, you may vote by proxy in any of the following ways:

- *Submit your proxy by mail.* You may complete, date and sign the proxy card and mail it in the postage-prepaid envelope that you received. The persons named in the proxy card will vote the shares you own in accordance with your instructions on the proxy card you return. If you return the proxy card but do not give any instructions on a particular matter described in this Proxy Statement, the persons named in the proxy card will vote the shares you own in accordance with the recommendations of our Board.

- *Submit your proxy over the Internet.* If you have Internet access, you may vote over the Internet at *www.proxyvote.com* by following the instructions set forth on your proxy card. If you submit your proxy over the Internet, it is not necessary to return your proxy card.

- *Submit your proxy by telephone.* If you are located in the United States or Canada, you may vote by telephone by calling 1-800-690-6903 and following the instructions set forth on your proxy card. If you submit your proxy by telephone, it is not necessary to return your proxy card.

The ability to vote by telephone or over the Internet for stockholders of record will be available until 11:59 p.m., Eastern Daylight Time on June 4, 2019.

If your shares are held in the name of a broker, bank or other nominee, please follow the voting instructions on the forms you received from such broker, bank or other nominee. The availability of submitting your voting instructions by telephone or over the Internet will depend upon their voting procedures.

Who is serving as the Company's inspector of elections?

Broadridge Financial Solutions, Inc. has been engaged as our independent inspector of elections to tabulate stockholder votes for the 2019 Annual Meeting.

How can I change my vote?

You may revoke your proxy and change your vote at any time before the polls close at the meeting. You may do this by signing and submitting a new proxy card with a later date, submitting a proxy by telephone or submitting a proxy over the Internet (your latest telephone or Internet proxy is counted), by giving written notice of revocation to our Secretary prior to the 2019 Annual Meeting or by attending the meeting and voting in person. If your shares are held in street name, you may change or revoke your voting instructions by following the specific directions provided to you by your bank or broker. Attending the meeting by itself, however, will not revoke your proxy unless you specifically request it.

What are the directions to the meeting?

The meeting is being held at the offices of Latham & Watkins LLP, 200 Clarendon Street, Boston, Massachusetts 02116. Please call (617) 948-6000 if you need directions.

PROPOSAL 1 — ELECTION OF DIRECTORS

Our Board has nominated eight directors for election at the 2019 Annual Meeting to hold office until the next annual meeting and the election of their successors. All of the nominees are currently directors. Each agreed to be named in this Proxy Statement and to serve if elected. All nominees are expected to attend the 2019 Annual Meeting.

In connection with the Merger, Sonus and GENBAND agreed on the selection of directors to serve on the initial Board of Directors of Ribbon upon the closing of the Merger as follows: Kim S. Fennebresque, Bruns H. Grayson, Franklin (Fritz) W. Hobbs, Kent J. Mathy and Richard W. Smith were designated by GENBAND, and Beatriz V. Infante, Richard J. Lynch, and Scott E. Schubert were designated by Sonus. Upon the closing of the Merger, we entered into a principal stockholders agreement (the "**Stockholders Agreement**") with Heritage PE (OEP) II, L.P. and Heritage PE (OEP) III, L.P., entities affiliated with the Company's largest stockholder, JPMorgan Chase & Co. (collectively with any successor entities, the "**JPM Stockholders**"). The JPM Stockholders owned 44.83% of Ribbon's common stock as of April 8, 2019. Under the Stockholders Agreement, the JPM Stockholders have designated Kim S. Fennebresque, Bruns H. Grayson, Kent J. Mathy and Richard W. Smith for election to our Board. The Company has agreed to take all necessary actions within its control to include the JPM Stockholders' designees in the slate of nominees recommended by the Board for election of directors and to cause the stockholders of the Company to elect the JPM Stockholders' designees. For so long as the JPM Stockholders have the right to designate a director under the Stockholders Agreement, with respect to any proposal or resolution relating to the election of directors, the JPM Stockholders have agreed to take all necessary actions within their control to vote their shares either affirmatively in favor of all of the Board's director nominees, or in the same proportion to all shares voted by other stockholders of the Company.

Except for Franklin (Fritz) W. Hobbs, our Chief Executive Officer (the "**CEO**"), and Richard W. Smith, each of our nominees is independent according to the director independence standards set forth in our Corporate Governance Guidelines, which meet the director independence standards of The Nasdaq Stock Market LLC ("**Nasdaq**"). For more information, see "*Corporate Governance and Board Matters — Director Independence*". We have no reason to believe that any of the nominees will be unable or unwilling to serve if elected. However, if any nominee should become unable to serve, or for good cause will not serve as a director, proxies may be voted for another person nominated as a substitute by the Board, or the Board may reduce the number of directors. In the event any director designated by the JPM Stockholders is unable to serve, the JPM Stockholders are entitled to designate a replacement director, subject to the conditions set forth in the Stockholders Agreement. Proxies cannot be voted for a greater number of persons than the number of nominees named in this proposal.

Director Experience and Tenure

Our directors collectively possess a broad mix of skills, qualifications and proven leadership abilities. The Nominating and Corporate Governance Committee practices a long-term approach to board refreshment. The Committee regularly identifies individuals who would complement and enhance the current directors' skills and experience.

It is of great importance to the Company that the Nominating and Corporate Governance Committee recruit directors who help achieve the goal of an experienced, diverse Board that functions effectively as a group. The Nominating and Corporate Governance Committee expects each of the Company's directors to have proven leadership skills, sound judgment, integrity, and a commitment to the success of the Company. In evaluating director candidates and considering incumbent directors for nomination to the Board, this Committee considers a variety of factors, including independence, financial literacy, personal and professional accomplishments, and experience in light of the needs of the Company. For incumbent directors, the factors also include attendance, past performance on the Board and contributions to the Board and its respective committees.

Director Nominees

The biographies below describe the skills, qualities, attributes and experience of the nominees that led the Board and its Nominating and Corporate Governance Committee to determine that it is appropriate to nominate these directors.

Kim S. Fennebresque, 69, has been a director of Ribbon since October 2017. He has served as a Senior Advisor to Cowen Group, Inc., a financial services company, since 2008, where he also served as its Chairman, President and Chief Executive Officer from 1999 to 2008. He has been the Chairman of the Board of Directors of BlueLinx Holdings Inc., a distributor of building products, since May 2013, and a member of the Board of Directors of Albertson's Companies LLC, a food and drug retailer, since May 2015. He was a Director of Ally Financial Inc., a bank holding company, since May 2009 and has also served on the board of the BAWAG Group, a leading financial services company headquartered in Austria, since September 2017. Mr. Fennebresque previously served as Chairman of Dahlman Rose & Co., a financial services company, from 2010 to 2012, head of the corporate finance and mergers & acquisitions departments at UBS and was a general partner and co-head of investment banking at Lazard Freres & Co. Prior to that, he held various positions at The First Boston Corporation, an investment bank acquired by Credit Suisse. Mr. Fennebresque earned his Bachelor of Arts degree from Trinity College and a Juris Doctor degree from Vanderbilt Law School. The Board believes Mr. Fennebresque is qualified to serve on the Board due to his experience in finance and as a chief executive officer and director of various public companies.

Bruns H. Grayson, 71, has been a director of Ribbon since October 2017. He is a Managing Partner at ABS Ventures, a venture capital firm, where he has managed all of the firm's partnerships since 1983. A majority of his investments has been in data communication and software and he has served as a director of many private and public companies over the last 30 years. Prior to ABS Ventures, Mr. Grayson was an associate at McKinsey and Co., a management consulting firm, from 1978 to 1980 and a venture capitalist at Adler & Co. from 1980 to 1983. Mr. Grayson has also served as a Director of Everbridge, Inc., a provider of communications solutions, since 2012. Mr. Grayson holds a Bachelor of Arts degree from Harvard College, a Master's degree from Oxford University, and a Juris Doctor degree from the University of Virginia Law School, and was elected a Rhodes Scholar from California in 1974. He served in the U.S. Army in Vietnam and separated as a captain in 1970. The Board believes Mr. Grayson is qualified to serve on the Board based on his knowledge of the data communication and software industries, his investment experience as a Managing Partner at ABS Ventures, and his experience as a director of various public companies.

Franklin (Fritz) W. Hobbs, 71, has been a director of Ribbon since October 2017 and its President and Chief Executive Officer since December 2017. He has served as Chairman of Ally Financial Inc., a bank holding company, since April 2009. He served as Supervisory Chairman of BAWAG PSK, an Austrian bank, in Vienna from 2013 to March 2017. He was previously the CEO of Houlihan Lokey Howard & Zukin and served as Chairman at UBS, AG's investment bank, Warburg Dillon Read. Prior to that, he was the President and Chief Executive Officer of Dillon, Read & Co. Inc., an investment bank, from 1992 to 1997. Mr. Hobbs currently serves as a Director of Molson Coors Brewing Co., a multinational brewing company, and UNICEF USA, a United Nations program that provides humanitarian and development assistance. Formerly, he served on the Board of Overseers of Harvard University, the Frick Collection and was President of the Board of Trustees of Milton Academy. He earned his Bachelor of Arts degree from Harvard College and a Master of Business Administration degree from Harvard Business School. The Board believes Mr. Hobbs is qualified to serve on the Board due to his role as Ribbon's Chief Executive Officer, his prior chief executive officer experience and his background in finance and investment banking.

Beatriz V. Infante, 65, has been a director of Ribbon since October 2017 and was a director of Sonus from January 2010 until the closing of the Merger. Since 2009, Ms. Infante has served as Chief Executive Officer of BusinessExcelleration LLC, a business consultancy specializing in corporate transformation and renewal. From 2010 until its acquisition by Infor in 2011, Ms. Infante was the Chief Executive Officer and a director of ENXSUITE Corporation, a leading supplier of energy management solutions. From 2006 until its acquisition by Voxeo Corporation in 2008, she was the Chief Executive Officer and a director of VoiceObjects Inc., a market leader in voice applications servers. Ms. Infante served as a director and Interim Chief Executive Officer of Sychron Inc., a data center automation company, from 2004 to 2005 until its sale to an investor group. Ms. Infante was Chief Executive Officer and President of Aspect Communications Corporation (which we refer to as Aspect), a market leader in communications solutions, from April 2000 until October 2003. She was named Board Chair of Aspect in February 2001 and between October 1998 and April 2000, held additional executive roles, including Co-President. Since January 2018, she has served on the Board of Directors and the Audit Committee of PriceSmart Inc., and additionally became Chair of the Compensation Committee and Chair of the Digital Transformation Committee in November 2018 and January 2019, respectively. She has served on the Board of Directors and Audit Committee of Liquidity Services Inc. since May 2014, and has additionally served as Chair of the Compensation Committee since November 2015. From July 2016 until its acquisition by Veeco in May 2017, Ms. Infante served on the Board of Directors and the Nominating and Corporate Governance Committee of Ultratech. From May 2012 until its acquisition by Broadcom Limited in May 2015, she served on the Board of Directors and Compensation Committee of Emulex Corporation, and additionally became Chair of the Nominating and Corporate Governance Committee in February 2014. Ms. Infante has previously served as a director at a number of privately held companies. Ms. Infante has also served since June 2016 as an Advisory Board member of Guardian Analytics and since July 2015 as the Chair of the Advisory Board of Infrascale. Additionally, Ms. Infante is a National Association of Corporate Directors Board Leadership Fellow, and in 2016 was named to the 2016 NACD Directorship 100, which honors the most influential boardroom leaders each year. In 2013, she was named to the Financial Times Agenda "Top 50 Digital Directors' List." Ms. Infante holds a Bachelor of Science and Engineering degree in Electrical Engineering and Computer Science from Princeton University and holds a Master of Science degree in Engineering Science from California Institute of Technology. Among other qualifications, the Board believes Ms. Infante is qualified to serve on the Board due to her executive leadership experience, including as a chief executive officer of various companies, along with extensive operational expertise and experience in engineering, sales, and marketing.

Richard J. Lynch, 70, has been a director and Chairman of the Board of Ribbon since October 2017 and was a director of Sonus from February 2014, and Chairman of the Board of Sonus from June 2016, until the closing of the Merger. Since September 2011, Mr. Lynch has served as the President of FB Associates, LLC, which provides advisory and consulting services at the intersection of technology, marketing and business operations. Mr. Lynch was the Executive Vice President and Chief Technology Officer for Verizon Communications between 2007 and 2011, and the Executive Vice President and Chief Technology Officer of Verizon Wireless and its predecessors from 1990 until 2007. Mr. Lynch has been at the forefront of wireless technology solutions and was responsible for the selection of CDPD, CDMA, EV-DO and LTE for use within the Verizon network. Building on these and other key technology decisions, Mr. Lynch has driven the introduction of key innovative products and services into the marketplace. Mr. Lynch is a Life Fellow of the Institute of Electrical and Electronic Engineers and has been awarded patents in the field of wireless communications. Mr. Lynch has served as a member of the Board of Directors and the Compensation, Nominating and Governance Committee of

Blackberry Limited since February 2013. He was also on the Board of Directors of VectoIQ Acquisition Corporation since February 2017. From March 2012 to May 2016, he served as a member of the Board of Directors, Chairman of the Nominating and Corporate Governance Committee and a member of the Compensation Committee of Ruckus Wireless, Inc. From November 2010 to November 2013, Mr. Lynch served as Chairman of the Board of Directors and a member of the Nominating and Corporate Governance Committee of TranSwitch Corp. Mr. Lynch also serves as a member of the Board of Directors of two privately held companies. He has also sat on the boards of numerous industry organizations, including the GSM Association and the CDMA Development Group, and as a member of the Federal Communications Commission Technical Advisory Committee and Communications Security Reliability and Interoperability Council. For his leadership in the early years of wireless data, Mr. Lynch was honored with the President's Award by the Cellular Telecommunications Industry Association. He has also been inducted into the Wireless History Foundation's Hall of Fame. Mr. Lynch is a graduate of Lowell Technological Institute (now the University of Massachusetts, Lowell), where he received Bachelor of Science and Master of Science degrees in electrical engineering. He has also completed post-graduate work at the Wharton School of the University of Pennsylvania and the Johnson School of Management at Cornell University. The Board believes Mr. Lynch is qualified to serve on the Board based on his significant experience in technology leadership positions, in particular at Verizon Communications, and as a director of various public companies in the telecommunications industry.

Kent J. Mathy, 59, has been a director of Ribbon since October 2017. He has been Chief Executive Officer of Sequential Technology International, a provider of customer care and customer experience outsourcing, since January 2017. Previously, beginning in November 2013, Mr. Mathy served as President, Southeast Region of AT&T Mobility, a wireless telecommunications provider. From November 2008 to November 2013, Mr. Mathy was President, North Central Region for AT&T Mobility, and from December 2007 to November 2008, he was President, Small Business for AT&T Mobility. From January 2003 to December 2007, he was President, Business Markets Group at Cingular Wireless (as AT&T Mobility was formerly known). Mr. Mathy has also served as a director of Everbridge, Inc. since 2013. Earlier in his career, Mr. Mathy held a variety of management positions at AT&T over a period of 18 years. Mr. Mathy holds a Bachelor of Arts degree in marketing from the University of Wisconsin-Oshkosh and attended the University of Michigan, Executive Program in 1993. The Board believes Mr. Mathy is qualified to serve on the Board because of his extensive leadership roles at various telecommunications companies, in particular at AT&T.

Scott E. Schubert, 65, has been a director of Ribbon since October 2017 and was a director of Sonus from February 2009 until the closing of the Merger. From 2005 until 2008, Mr. Schubert served as Chief Financial Officer of TransUnion LLC, a leading global information solutions company. From 2003 to 2005, Mr. Schubert served as Chief Financial Officer and, prior to that, Executive Vice President of Corporate Development of NTL, Inc. (now Virgin Media, Inc.). From 1999 to 2003, Mr. Schubert held the position of Chief Financial Officer of Williams Communications Group, Inc., a high-technology company. Mr. Schubert also was the head of BP Amoco's Global Financial Services from 1995 to 1999, leading the initial integration of BP and Amoco's worldwide financial operations following the merger of the two companies in 1998. From August 2011 to October 2014, he served as a member of the Board of Directors, the Compensation Committee, the Audit Committee and the Compliance Committee of Isle of Capri Casinos, Inc. Mr. Schubert is a graduate of the Krannert School of Business at Purdue University, where he completed his Master of Business Administration degree in Finance and Economics. He also earned his Bachelor of Science degree at Purdue University, with dual majors in Engineering and Accounting. Among other qualifications, Mr. Schubert brings to the Board executive leadership experience, including from his service as a chief financial officer of various companies, along with extensive financial expertise. The Board believes Mr. Schubert is qualified to serve on the Board because of his experience as a Chief Financial Officer, in particular at

TransUnion LLC and NTL, Inc. (now Virgin Media, Inc.), and his experience leading the integration of two large public companies.

Richard W. Smith, 66, has been a director of Ribbon since October 2017. He has been the Head of Private Investments at JPMorgan Chase & Co., a multinational banking and financial services holding company, since November 2014, which position includes private and public company investments on the bank's balance sheet. He has held positions as Managing Director and Managing Partner and General Partner at private equity and venture funds since 1981, including One Equity Partners from 2002 to November 2014 and Allegra Partners and predecessor entities from 1981 to 2013. From 1979 to 1981, Mr. Smith was Senior Investment Manager at Citicorp Venture Capital Ltd., a former venture and private equity investment division of Citigroup Inc. Prior to that, he worked in the International Money Management Group of Morgan Guaranty Trust Company of New York from 1974 to 1979. Mr. Smith was previously a Director of GENBAND from 2014 to 2017 and has 40 years' experience as a technology investor and as a board member of both public and private companies. He has also served as a Director of Smartrac N.V., a provider of software and RFID tags targeted at the Internet of Things market, since 2012, Alorica, Inc., a provider of outsourced customer care solutions, since July 2016, and Merchant-Link, LLC, a provider of cloud-based payment gateway and data security solutions, since October 2016. He also served as Chairman of Schoeller Allibert Group, a manufacturer of Returnable Transit Packaging, from July 2016 to May 2018. Additionally, he has served as a Director of the Princeton National Rowing Association since 2008. Mr. Smith earned his Bachelor of Arts from Harvard College and is co-author of the book Treasury Management: A Practitioner's Handbook, John Wiley & Sons, 1980. The Board believes Mr. Smith is qualified to serve on the Board due to his extensive background in finance and private equity and his experience serving as a director of companies in the telecommunications industry.

Board of Directors' Recommendation

The Board of Directors recommends that stockholders vote "FOR" the election of the eight director nominees named above.

PROPOSAL 2 — APPROVAL OF RIBBON'S 2019 INCENTIVE AWARD PLAN

Our Board believes that the future success of Ribbon depends, in large part, on our ability to maintain a competitive position in attracting, retaining and motivating key employees with relevant experience and superior ability. On April 24, 2019, our Board adopted, subject to stockholder approval, the Ribbon Communications Inc. 2019 Incentive Award Plan (the "**New Plan**"). Awards granted under the New Plan are intended to attract, retain and motivate personnel who are expected to make important contributions to the Company, thereby promoting shareholder interests and enhancing shareholder value. The Company may grant awards under the New Plan with respect to up to 7,000,000 shares of common stock (subject to adjustment in the event of stock splits and other similar events), plus the number of shares of common stock previously reserved for issuance under the Company's Amended and Restated Stock Incentive Plan (the "**2007 Equity Plan**") that remained available for grant as of the date of approval of the New Plan, if at all, by the Company's stockholders at its 2019 Annual Meeting, plus any shares covered by covered by awards under the 2007 Equity Plan (or Prior Plans (as defined below)) that again become available for grant pursuant to the provisions of the 2007 Equity Plan.

The New Plan is intended to replace the 2007 Equity Plan, which is expected to expire on June 9, 2026. While the 2007 Equity Plan does not expire for another seven years, our Board adopted the New Plan to more fully represent the interests of the combined companies as well as to reflect recent changes to stock grant philosophies in the marketplace.

If the New Plan is approved by our stockholders, the New Plan will become effective on June 5, 2019, and no further awards will be made under the current 2007 Equity Plan or any Prior Plan. We expect the proposed aggregate share reserve under the New Plan to provide us with sufficient shares for awards for at least two years, assuming we continue to grant awards consistent with our current practices and historical usage, as reflected in our historical burn rate, and further dependent on the price of our shares and hiring activity during the next few years, forfeitures of outstanding awards, and noting that future circumstances may require us to change our current equity grant practices. We cannot predict our future equity grant practices, the future price of our shares or future hiring activity with any degree of certainty at this time, and the share reserve under the New Plan could last for a shorter or longer time. If stockholders do not approve the New Plan, the current 2007 Equity Plan will remain in effect in its current form. However, there will be insufficient shares available under the 2007 Equity Plan to make annual awards and to provide grants to new hires in the coming years. In this event, the Compensation Committee would be required to revise its compensation philosophy and formulate other cash-based programs to attract, retain, and compensate key employees and non-employee directors.

The Board believes that the future success of the Company depends, in large part, upon the ability of Ribbon to maintain a competitive position in attracting, retraining and motivating key personnel. **Accordingly, the Board believes the adoption of the New Plan is in the best interests of the Company and its stockholders and recommends a vote "FOR" the approval of the New Plan.**

Highlights of the New Plan

No "Evergreen" Provision	• Shares authorized for issuance under the New Plan are not automatically replenished.
No Liberal Share Counting	• The New Plan prohibits the reuse of shares withheld or delivered to satisfy the exercise price of an award or to satisfy tax withholding requirements with respect to any award.
No Repricing of Stock Options or Stock Appreciation Rights	• The New Plan prohibits the direct or indirect repricing of stock options or stock appreciation rights ("**SARs**") without stockholder approval, including a prohibition on the exchange of "underwater" stock options or SARs for a cash payment.
No Discounted Stock Options or Stock Appreciation Rights	• All stock options and SARs (other than substitute awards) must have an exercise price or measurement price equal to or greater than the fair market value of the underlying common stock on the grant date.
Minimum One-Year Vesting Period on All Awards	• Awards under the New Plan are subject to a minimum vesting period of one year, except awards granted, in the aggregate, for up to 5% of the maximum number of authorized shares under the New Plan and awards subject to certain other limited exceptions.
Awards Subject to Forfeiture/ Clawback	• All awards granted under the New Plan and payments made thereunder are subject to the Company's Clawback Policy or any other clawback policy established from time to time by the Company.
No Dividends or Dividend Equivalents on Unvested Awards	• No participant will be paid dividends or dividend equivalents with respect to any award until the applicable vesting conditions have been satisfied.
No "Liberal" Change in Control Definition	• The change in control definition in the New Plan is not "liberal" and, for example, would not occur merely upon shareholder approval of a transaction. A change in control must actually occur in order for the change in control provisions in the New Plan to be triggered.
Administration by an Independent Committee	• Administration of the New Plan has been delegated to the Compensation Committee, which is comprised of independent directors.
Material Amendments Require Stockholder Approval	• Stockholder approval is required prior to an amendment of the New Plan that would (i) materially increase the number of shares available, (ii) expand the types of available awards or (iii) materially expand the class of participants eligible to participate.

Analysis of Share Reserve

In adopting the New Plan, the Compensation Committee and our Board, respectively, reviewed and relied upon the analysis prepared by Frederic W. Cook & Co., Inc., the Compensation Committee's independent compensation consultant, which analyzed the costs of the plan, the Company's past practices regarding its equity compensation program (including share usage or burn rate), provisions associated with the proposed New Plan and trends, as well as practices of Company peers and other companies. Specifically, the Compensation Committee and our Board considered, among other things, the information set forth below.

Share Usage and Overhang

The following table sets forth information regarding stock-settled, time-vested equity awards granted and performance-based, stock-settled equity awards earned over each of the last three fiscal years:

	2018	2017	2016	
Stock Options/SARs Granted	—	7,760	172,450	
Stock-Settled Time-Vested Restricted Shares/Units Granted	2,032,256	1,763,912	1,720,082	
Stock-Settled Performance-Based Stock Units Earned	57,768	145,357	18,438	
Weighted-Average Basic Common Shares Outstanding	103,916,078	58,822,000	49,385,000	**3-Year Average**
Share Usage Rate	2.0%	3.3%	3.9%	**3.0%**

The Board recognizes that the increase in the number of shares under the New Plan will result in additional dilution or "overhang" for our stockholders, although we believe that the incremental dilution would not be material. As commonly calculated, the total potential overhang resulting from the adoption of the New Plan would be approximately 11.2%, with the incremental overhang resulting from the share increase equal to approximately 5.8%. This overhang is calculated as follows, as of December 31, 2018 (unless otherwise noted):

(a) Stock Options/SARs Outstanding	582,061
Weighted-Average Exercise Price of Outstanding Stock Options/SARs	$9.01
Weighted-Average Remaining Term of Outstanding Stock Options/SARS	4.82
(b) Total Stock-Settled Full-Value Awards Outstanding	2,354,727
(c) Shares Remaining Available for Future Issuance	4,932,727
(d) Incremental Share Request Subject to Shareholder Approval	7,000,000
(e) Total shares authorized for, or outstanding under, equity awards (a + b + c + d)	14,869,515
(f) Common shares outstanding as of the record date of April 15, 2019	111,390,821
(g) Total fully-diluted overhang (e / (e + f))	11.8%

In light of the factors described above and the fact that the ability to continue to grant equity compensation is integral to our ability to continue to attract and retain talented employees in the markets in which we compete, the Compensation Committee and our Board have determined that the size of the share reserve under the New Plan is reasonable and appropriate at this time. The Board will not create a subcommittee to evaluate the risks and benefits for issuing the additional authorized shares requested.

EQUITY COMPENSATION PLAN INFORMATION

The following table provides information as of December 31, 2018 with respect to the shares of our common stock that may be issued under our existing equity compensation plans:

Plan Category	(A) Number of Securities to be Issued upon Exercise of Outstanding Options, Warrants and Rights	(B) Weighted Average Exercise Price of Outstanding Options, Warrants and Rights	(C) Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (A))
Equity Compensation Plans Approved by Stockholders	846,716(1)	$ —	4,880,269(2)
Equity Compensation Plans Not Approved by Stockholders	582,061(3)	$9.01(4)	52,458(5)
	1,428,777		4,932,727

(1) Consists of 636,600 RSUs and 210,416 PSUs at target, all of which do not have voting or other rights of ownership under the 2007 Equity Plan.

(2) Consists of shares available for future issuance under the 2007 Equity Plan and the Amended and Restated 2000 Employee Stock Purchase Plan (the "**ESPP**"). As of December 31, 2018, 3,448,756 shares of common stock were available for issuance under the 2007 Equity Plan and 1,431,513 shares of common stock were available for issuance under the ESPP. In addition to being available for future issuance upon exercise of options that may be granted after December 31, 2018, the shares available under the 2007 Equity Plan may also be issued in the form of restricted stock, RSUs, SARs, performance-based awards or other equity-based awards.

(3) Consists of 267,732 options outstanding under the 2008 Stock Incentive Plan (the "**2008 Plan**", which was assumed in connection with the Company's August 24, 2012 acquisition of Network Equipment Technologies, Inc. ("**NET**")) and 40,160 options outstanding under the 2012 Amended Performance Technologies, Incorporated Omnibus Incentive Plan (the "2012 Plan", which was assumed in connection with the Company's February 19, 2014 acquisition of Performance Technologies, Incorporated ("**PT**")) and 274,169 options outstanding under the Edgewater Networks, Inc. Amended and Restated 2002 Stock Option Plan, as amended (assumed in connection with the Company's August 3, 2018 acquisition of Edgewater) (the "**2002 Plan**"). These amounts include options that were either outstanding as of the respective dates of acquisition of NET, PT and Edgewater and assumed by the Company or granted under either the 2008 Plan or the 2012 Plan since the respective acquisition dates. No future awards may be granted under any of the 2008 Plan or 2012 Plan.

(4) Represents the weighted average exercise price for options to purchase the Company's common stock outstanding under the 2008 Plan, the 2012 Plan and the 2002 Plan.

(5) Consists of shares available for future issuance under the 2002 Plan. The Company does not intend to make any future grants under the 2002 Plan. At the Company's special meeting of stockholders on December 2, 2014, our stockholders approved amendments to the 2007 Equity Plan that, among other matters, transferred all shares available for future issuance from each of the 2008 Plan and 2012 Plan to the 2007 Equity Plan and provided that any outstanding awards under the 2008 Plan and 2012 Plan that expire, are terminated, cancelled, surrendered or forfeited, or are repurchased by the Company at their original issuance price pursuant to a

contractual repurchase right under the 2008 Plan or 2012 Plan will be returned to the 2007 Equity Plan.

Summary of the New Plan

The following is a summary of the material terms of the New Plan and is qualified by its entirety by the full text of the New Plan, a copy of which is attached as ***Appendix B*** to this Proxy Statement. References to our Board in this summary include the Compensation Committee or any similar committee appointed by our Board to administer the New Plan.

Shares Available for Issuance under the New Plan

Awards may be made under the New Plan for an aggregate number of shares equal to 7,000,000 shares, plus the number of shares of common stock reserved under the 2007 Equity Plan that remain available for issuance as of the date of the 2019 Annual Meeting. The number of shares issuable under the New Plan is subject to adjustment for changes in capitalization, including stock splits and other similar events. No more than 7,000,000 shares of common stock may be issued as incentive stock options under the New Plan.

If an award expires, terminates, is surrendered or cancelled or otherwise results in shares not being issued, the unused shares covered by such award will generally become available for future grant under the New Plan. However, any shares tendered to pay the exercise price of an award or to satisfy a tax withholding obligation will not become available for future grant under the New Plan. Furthermore, any shares repurchased by us on the open market using the proceeds from the exercise of an award will not increase the number of shares available for the future grant of awards under the New Plan. In addition, shares subject to a SAR that are not issued in connection with its share settlement on exercise thereof will not increase the number of shares of common stock available for the future grant of awards under the New Plan.

If any award (or award under the 2007 Equity Plan, the Company's 2008 Stock Incentive Plan or the Company's 2012 Amended Performance Technologies, Incorporated Omnibus Incentive Plan (collectively, the "**Prior Plans**")) expires or is terminated, surrendered or canceled without having been fully exercised, is cash-settled, is forfeited in whole or in part (including as the result of shares of common stock subject to such award (or award under a Prior Plan) being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right), then shares of common stock covered by such award (or award under a Prior Plan) will, to the extent of such termination, surrender, cancellation, cash-settlement or forfeiture, again become available for the grant of awards under the New Plan.

In connection with a corporate transaction with another entity, such as a merger or consolidation of an entity with us or our acquisition of property or stock of an entity, our Board may grant awards under the New Plan in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof on such terms as our Board determines appropriate in the circumstances, notwithstanding any limitation on awards contained in the New Plan (subject to compliance with the applicable requirements of Section 424 of the Code and Section 409A of the Code (together with the Department of Treasury regulations and other interpretive guidance issued thereunder, "**Section 409A**")). No such substitute awards will count against the overall share limits described above, except as required by Section 422 and related provisions of the Code.

Administration of the New Plan

The New Plan is administered by our Board, which has the authority to adopt, amend and repeal the administrative rules, guidelines and practices relating to the New Plan and to interpret the provisions of the New Plan. Pursuant to the terms of the New Plan and to the extent permitted by applicable law, our Board may delegate authority under the New Plan to one or more committees or subcommittees of our Board. Our Board has authorized the Compensation Committee to administer the New Plan.

Subject to any applicable limitations contained in the New Plan, our Board, the Compensation Committee, or any other committee to whom our Board delegates authority, as the case may be, selects the recipients of awards and determines the terms of the awards.

Subject to any requirements of applicable law, our Board may delegate to one or more of our officers the power to grant awards to our employees, officers, and non-executive directors (each, a "**Director**"), as well as consultants and advisors to the Company (as the terms consultants and advisors are defined and interpreted for purposes of Form S-8 under the Securities Act or any successor form) and to exercise such other powers under the New Plan as our Board may determine; provided that our Board will fix the maximum number of shares subject to awards that the officers may grant, and the time period in which such awards may be granted. No officer shall be authorized to grant awards to himself or herself or any of our other officers.

Our Board may make equitable adjustments in connection with the New Plan and any outstanding awards to reflect stock splits, stock dividends, recapitalizations, combination or exchange of shares, consolidation, reclassification of shares, spin-offs and other similar changes in capitalization or event, or any other dividend or distribution other than an ordinary cash dividend, or any other change affecting the shares of common stock or the share price of the common stock (other than an Equity Restructuring, as such term is defined below). In the event of an Equity Restructuring, the Company will equitably adjust in the manner determined by our Board the number and class of security subject to each outstanding award and the exercise or purchase price thereof, if applicable (and such adjustments shall be nondiscretionary and final and binding) and/or the aggregate number and class of security that may be issued under the New Plan (including, without limitation, any share counting provisions related thereto). "Equity Restructuring" means a nonreciprocal transaction between the Company and our stockholders, such as a stock dividend, stock split, spin-off, rights offering or recapitalization through a large, nonrecurring cash dividend, that affects the number or kind of shares of common stock (or other securities of the Company) or the share price of common stock (or other securities) and causes a change in the per-share value of the common stock underlying outstanding awards.

The New Plan also contains provisions addressing the consequences of a Reorganization Event, which is defined as: (i) any merger or consolidation of the Company with or into another entity as a result of which all of our common stock is converted into or exchanged for the right to receive cash, securities or other property, or is cancelled; (ii) any exchange of all of our common stock for cash, securities or other property pursuant to a share exchange transaction; (iii) any liquidation or dissolution of our Company; or (iv) certain capitalization events described in the New Plan or any other unusual or nonrecurring transaction or event affecting the Company or any of its subsidiaries (or their respective financial statements).

In connection with a Reorganization Event, our Board may take any one or more of the following actions as to all or any (or any portion of) outstanding awards, on such terms as our Board determines:

- provide that awards will be assumed, or substantially equivalent awards will be substituted, by the acquiring or succeeding corporation (or an affiliate thereof);
- upon written notice, provide that all unexercised awards will terminate immediately prior to the consummation of such Reorganization Event unless exercised within a specified period following the date of such notice;
- provide that outstanding awards will become exercisable, realizable or deliverable, or restrictions applicable to an award will lapse, in whole or in part prior to or upon such Reorganization Event;
- in the event of a Reorganization Event under the terms of which holders of our common stock will receive upon consummation thereof a payment of cash and/or property for each share surrendered in the Reorganization Event (the value of such payment, the "**Acquisition Price**"), make or provide for a payment of cash and/or property to an award holder with a value equal to the excess, if any, of (A) the Acquisition Price times the number of shares of common stock subject to the holder's awards (to the extent the exercise price does not exceed the Acquisition Price) over (B) the aggregate exercise price of all such outstanding awards and any applicable tax withholdings, in exchange for the termination of such awards (and, if as of the Reorganization Event, our Board determines in good faith that there is no such excess with respect to an award, then such award may be terminated by the Company without payment);
- provide that awards will be replaced with other rights or property selected by our Board (including in connection with a liquidation or dissolution of our company, conversion into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof and any applicable tax withholdings);
- provide that awards cannot vest, be exercised or become payable after the Reorganization Event; and
- any combination of the foregoing.

In taking any of the actions permitted directly above, the Board is not obligated by the New Plan to treat identically all awards, all awards held by a holder of such awards or all awards of the same type.

The New Plan also contains provisions addressing a Change in Control and our Board's authority to determine whether a Change in Control has occurred pursuant to the below definition, the date of the occurrence of a Change in Control, and any incidental matters related thereto. Under the New Plan, a Change in Control means:

(i) a transaction or series of transactions (other than an offering of common stock to the general public through a registration statement filed with the SEC) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) directly or indirectly acquires beneficial ownership (within the meaning of Rules 13d-3 and 13d-5 under the Exchange Act) of securities of the Company possessing more than 50% of the total combined voting power of the

Company's securities outstanding immediately after such acquisition; provided, however, that the following acquisitions shall not constitute a Change in Control under the New Plan: (A) any acquisition by the Company; (B) any acquisition by an employee benefit plan maintained by the Company, (C) any acquisition which is not a Change in Control under subsection (iii) below as a result of compliance with subsections (A), (B) and (C) of subsection (iii) below; or (D) in respect of an award held by a particular participant, any acquisition by the participant or any group of persons including the participant (or any entity controlled by the participant or any group of persons including the participant); or

(ii) the Incumbent Directors cease for any reason to constitute a majority of our Board;

(iii) the consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination, (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(A) which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "**Successor Entity**")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities,

(B) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this subsection (B) as beneficially owning 50% or more of the combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction; and

(C) immediately after which at least a majority of the members of the board of directors (or the analogous governing body) of the Successor Entity were Board members at the time of our Board's approval of the execution of the initial agreement providing for such transaction; or

(iv) The effective date of a liquidation or dissolution of the Company.

"Incumbent Directors" means for any period of 12 consecutive months, individuals who, at the beginning of such period, constitute our Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in subsection (i) or (iii) above) whose election or nomination for election to our Board was approved by a vote of at least a majority (either by a specific vote or by approval of the proxy statement of the Company in which such person is named as a nominee for Director without objection to such nomination) of the Directors then still in office who either were Directors at the beginning of the 12-month period or whose election or nomination for election was previously so approved. No individual initially elected or nominated as a director of the Company as a result of an actual or threatened election contest with respect to Directors or as a result of any other actual or threatened solicitation of proxies by or on behalf of any person other than our Board shall be an Incumbent Director.

Notwithstanding the foregoing, if a Change in Control constitutes a payment event with respect to any award (or any portion of an award) that provides for the deferral of compensation that is subject to Section 409A, to the extent required to avoid the imposition of additional taxes under Section 409A, the transaction or event described in subsection (i), (ii), (iii) or (iv) above with respect to such award (or portion thereof) will only constitute a Change in Control for purposes of the payment timing of such award if such transaction also constitutes a "change in control event," as defined in Treasury Regulation Section 1.409A-3(i)(5).

Our Board may at any time provide that any award will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part, as the case may be, including, without limitation, (A) upon the death or disability of the holder of such award or (B) in connection with an Acquisition of the Company (as defined in the New Plan).

Except as otherwise provided in the New Plan with respect to repricing outstanding stock options or SARs, our Board may amend, modify or terminate any outstanding award, including but not limited to, substituting another award of the same or a different type, changing the date of exercise or realization, and converting an incentive stock option to a non-statutory stock option, provided that the participant's consent to any such action will be required unless our Board determines that the action, taking into account any related action, would not materially and adversely affect the participant or the change is otherwise permitted under the terms of the New Plan in connection with a change in capitalization or reorganization event.

Descriptions of Awards

The New Plan provides for the grant of incentive stock options intended to qualify under Section 422 of the Code, non-statutory stock options, SARs, restricted stock, RSUs and other stock unit awards and performance awards as described below.

Incentive Stock Options and Non-statutory Stock Options. Optionees receive the right to purchase a specified number of shares of common stock at a specified option price and subject to such other terms and conditions as are specified in connection with the option grant. Options must be granted at an exercise price that is not less than the fair market value of our common stock at the close of trading on the date of grant. Options may not be granted for a term in excess of 10 years; provided that, notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of an option (other than an incentive stock option) (i) the exercise of the option is prohibited by applicable law, as determined by the Company, or (ii) shares of common stock may not be purchased or sold by the applicable participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the option shall be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, the extension will not last beyond the term of the applicable option (which will in no event exceed 10 years from the date of grant). The New Plan permits the following forms of payment for the exercise price of options: payment by cash or check (if determined appropriate by the Company, electronic payment); via broker-assisted sale; subject to

certain conditions and if permitted by our Board, withholding of shares of our common stock otherwise issuable under an award or surrender to the Company of shares of our common stock held by the optionee; any other lawful means as provided for in the applicable option agreement or approved by the Board; or any combination of these forms of payment. Stock options granted under the New Plan may not provide for the payment or accrual of dividend equivalents or contain any provision entitling the grantee to the automatic grant of additional stock options in connection with the exercise of the original stock option.

Stock Appreciation Rights. A SAR is an award entitling the holder, upon exercise, to receive an amount in common stock or cash or a combination thereof determined by reference to appreciation, from and after the date of grant, in the fair market value of a share of common stock over the exercise price, which may not be less than the fair market value of the common stock on the date the SAR is granted. SARs may be granted independently or in tandem with an option granted under the New Plan. Each SAR granted under the New Plan will be exercisable subject to terms and conditions as the Board may specify in the applicable SAR agreement; provided that, notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of an SAR (i) the exercise of the SAR is prohibited by applicable law, as determined by the Company, or (ii) shares of common stock may not be purchased or sold by the applicable participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the SAR will be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, that the extension will not last beyond the term of the applicable SAR (which, in no event will exceed 10 years from the date of grant) SARs granted under the New Plan may not provide for the payment or accrual of dividend equivalents or contain any provision entitling the grantee to the automatic grant of additional SARs in connection with the exercise of the original SAR.

Restricted Stock Awards. Restricted stock awards entitle recipients to acquire shares of common stock, subject to our right to repurchase all or part of such shares at their issue price or other stated or formula price or to require forfeiture if issued at no cost if the conditions specified in the applicable award are not satisfied prior to the end of the applicable restriction period established by the Board for such award. Our Board will determine the terms and conditions of the applicable award, including the conditions for vesting and repurchase and the issue price, if any. Any dividends, whether paid in cash, stock or property, declared and paid by us with respect to shares of restricted stock will be paid to a participant only if and when such shares become free from the restrictions on transferability and forfeitability that apply to such shares. No interest will be paid on unvested dividends.

Restricted Stock Unit Awards. RSU awards entitle the recipient to receive shares of common stock or cash to be delivered at the time such award vests pursuant to the terms and conditions established by our Board. The award agreement for RSUs may provide the participant with a right to receive dividend equivalents, which will be subject to the same restrictions on transfer and forfeitability as the underlying RSUs. No interest will be paid on dividend equivalents.

Other Stock or Cash-Based Awards. Under the New Plan, our Board has the right to grant other awards of shares of common stock and other awards that are valued in whole or in part by reference to, or otherwise based on, shares of common stock or other property ("**Other Stock-Based Awards**"), which may include, without limitation, deferred shares or deferred stock units, as well as cash payments and other cash bonus awards ("**Cash-Based Awards**"), and dividend equivalents and awards entitling recipients to receive shares of common stock or cash to be delivered in the future (collectively, "**Other Stock- Based Awards and Cash-Based Awards**"). Other Stock-Based Awards and

Cash-Based Awards will have such terms and conditions as our Board may determine. An Other Stock-Based Award may provide the participant with a right to receive dividend equivalents, which may be settled in cash and/or shares of common stock and will be subject to the same restrictions on transfer and forfeitability as the underlying Other Stock-Based Award. No interest will be paid on dividend equivalents.

Performance Awards. Under the New Plan, any award may be made subject to the achievement of performance goals. For any performance award, our Board may specify that the degree of vesting, settlement and/or payout (or other term or condition of the performance award) shall be subject to the achievement of one or more performance measures established by the Board, which may include, without limitation, the relative or absolute attainment of specified levels of one or any combination of the following: (i) bookings, (ii) backlog, (iii) revenue, (iv) gross margin ($), (v) gross profit (%), (vi) operating expenses, (vii) operating income (loss), (viii) net income (loss), (ix) earnings (loss) per share, (x) earnings before interest, taxes, depreciation and/or amortization ("**EBITDA**"), (xi) adjusted EBITDA, (xii) earnings before interest and/or taxes ("**EBIT**"), (xiii) adjusted EBIT, (xiv) cost reduction or savings, (xv) productivity ratios or other similar metrics, (xvi) performance against budget, (xvii) cash flow from operations, (xviii) stock price, (xix) financial ratings, (xx) financial metrics and ratios, (xxi) exit rate operating metrics, (xxii) total stockholder return (whether in the absolute or measured against or in relationship to other companies comparably, similarly or otherwise situated), (xxiii) regulatory achievements or compliance (including, without limitation, regulatory body approval for commercialization of a product), (xxiv) implementation or completion of critical projects, (xxv) economic value or economic value added, (xxvi) customer satisfaction, (xxvii) working capital targets, (xxviii) organization/transformation metrics, (xxix) return measures (including but not limited to, return on assets, capital, invested capital, equity, sales or revenue), (xxx) market share, and (xxxi) any other objective or subjective measure determined by our Board.

The Board may specify that such performance measures shall be adjusted to take into account events or circumstances determined appropriate by the Board. Performance measures may vary by participant and may be different for different awards and may be particular to a participant or the department, branch, line of business, subsidiary or other unit in which the participant works and may cover such period as may be specified by the Board. Performance measures may be calculated on generally accepted accounting principles ("**GAAP**") or non-GAAP basis or otherwise in accordance with applicable accounting principles or such other methodology as determined appropriate by our Board.

Restrictions on Repricings

Unless approved by our stockholders, our Board may not: (i) lower the exercise price of an option or a SAR; (ii) cancel an option or SAR when the exercise price per share exceeds the fair market value of one share in exchange for cash or another award (other than in connection with a change in control); or (iii) take any other action with respect to an option or SAR that would be treated as repricing under the rules and regulations of the principal U.S. national securities exchange on which the shares of common stock are listed.

Transferability of Awards

Awards, other than vested shares of restricted stock, may not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an incentive stock option, pursuant to a qualified domestic relations order. During the life of the holder of an award, awards, other than vested shares of restricted stock, are exercisable only by such holder. Our Board may permit the gratuitous transfer of an award by the holder of an award to or for the benefit

of any immediate family member, family trust or other entity established for the benefit of such holder or an immediate family member of such holder if, with respect to such transferee, the Company would be eligible to use a Form S-8 for the registration of the sale of the common stock subject to such award under the Securities Act of 1933, as amended.

Eligibility to Receive Awards

Our employees, non-employee directors, consultants and advisors and those of our subsidiaries are eligible to be granted awards under the New Plan.

As of April 1, 2019, approximately 2,287 employees, seven non-employee directors and two consultants and advisors were eligible to receive awards under the New Plan, including our executive officers and non-employee directors. On April 15, 2019, the last reported sale price of common stock on the Nasdaq Global Select Market was $5.16.

Director Award Limit

During any calendar year, the sum of the grant date fair value of awards and the amount of any cash fees granted or paid to non-employee directors in respect of such director's services for such year, may not exceed $650,000, provided that the Board may make exception to such limit in extraordinary circumstances.

Clawback Policy

All awards granted under the New Plan are subject to clawback pursuant to the Company's Clawback Policy and any other clawback policy that the Company may adopt in the future.

Minimum Vesting Periods

Under the New Plan, no award (other than cash-based awards) will vest earlier than the first anniversary of its date of grant; provided, however, such minimum vesting requirement will not apply to (i) any substitute award, (ii) shares of common stock delivered in lieu of full-vested cash-based awards (or other cash awards or payments), (iii) awards to non-employee directors of the Company that vest on the earlier of the one-year anniversary of the date of grant and the next annual meeting of stockholders which is at least 50 weeks after the immediately preceding year's annual meeting, and (iv) any additional awards our Board may grant, up to a maximum of five percent (5%) of the available share reserve authorized for issuance under the New Plan (subject to adjustment for certain capitalization and reorganization events); and, provided, further, that the foregoing restriction does not apply to our Board's discretion to provide for accelerated exercisability or vesting of any awards upon (A) the death or disability of a participant, (B) in connection with retirement, termination of employment or other separation from service, or (C) in connection with a change in control.

Treatment of Dividends and Dividend Equivalents on Unvested Awards

Notwithstanding any other provision of the New Plan to the contrary, with respect to any award that provides for or includes a right to dividends or dividend equivalents, if dividends are declared during the period that an equity award is outstanding, such dividends (or dividend equivalents) shall either (i) not be paid or credited with respect to such award or (ii) be accumulated but remain subject to vesting requirement(s) to the same extent as the applicable award and shall only be paid at the time or times such vesting requirement(s) are satisfied.

Provisions for Foreign Participants

Our Board may modify awards granted to participants who are foreign nationals or employed outside the United States or establish subplans or procedures under the New Plan to recognize differences in laws, rules, regulations or customs of such foreign jurisdictions with respect to tax, securities, currency, employee benefit or other matters.

Effective Date and Term of New Plan; Amendment or Termination

The New Plan will be adopted upon stockholder approval at our 2019 Annual Meeting. Our Board may at any time amend, suspend or terminate the New Plan; provided that, to the extent determined by our Board, no amendment requiring stockholder approval under any applicable legal, regulatory or listing requirement will become effective until such stockholder approval is obtained.

New Plan Benefits / Interest of Certain Persons

Shareholders should understand that our executive officers and non-employee directors may be considered to have an interest in the approval of the New Plan because they may in the future receive awards under such plan. In particular, to the extent the New Plan is approved by our stockholders, certain of our named executive officers, other executive officers, non-executive directors and non-executive officer employees are expected to receive certain RSU grants in the amounts set forth below:

Name and Position	Dollar Value(1)
Franklin (Fritz) W. Hobbs, *our President and Chief Executive Officer*	$2,000,000
Daryl E. Raiford, *our Executive Vice President and Chief Financial Officer*	$350,000
Steven Bruny, *our Executive Vice President, Global Sales and Services*	$375,000
Anthony Scarfo, *our Executive Vice President, Products, Research and Development, Support and Supply Chain*	$375,000
Michael Swade, *our former Executive Vice President, Global Sales*	—
Executive Group, Excluding NEOs	$900,000
Non-Executive Director Group	$720,000
Non-Executive Officer Employee Group	$362,500

(1) Number of shares underlying awards is not determinable at this time and will be determined by dividing the dollar value of each individual's grant by the closing price of our common stock on the date of grant.

The benefits that will be received by participants, including the named executive officers, other executive officers, non-executive directors and other non-executive officer employees, under the New Plan will depend on a variety of factors, including the fair market value of the Company's common stock at various future dates and the Board's discretion in granting awards. Therefore, except as set forth in the table above, it is not possible to determine the benefits that would have been received by or allocated to for the last fiscal year, or that will be received by or allocated to, any participants, including the name executive officers, other executive officers, non-executive directors and other non-executive officer employees if the New Plan is approved by our stockholders. For additional information regarding our equity grants in 2018, please see the tables entitled "*Grants of Plan-Based Awards*" and "*Director Compensation*" in this Proxy Statement.

Federal Income Tax Consequences

The following summarizes the United States federal income tax consequences that generally will arise with respect to awards granted under the New Plan. This summary is based on the federal tax laws in effect as of the date of this Proxy Statement. In addition, this summary assumes that all awards are exempt from, or comply with, the rules under Section 409A of the Code regarding nonqualified deferred compensation. Changes to these laws or assumptions could alter the tax consequences described below.

Incentive Stock Options. A participant will not have income upon the grant of an incentive stock option. Also, except as described below, a participant will not have income upon exercise of an incentive stock option if the participant has been employed by us or our corporate parent or a 50% or more-owned corporate subsidiary at all times beginning with the option grant date and ending three months before the date the participant exercises the option. If the participant has not been so employed during that time, then the participant will be taxed as described below under the section entitled "Non-statutory Stock Options." The exercise of an incentive stock option may subject the participant to the alternative minimum tax.

A participant will have income upon the sale of the stock acquired under an incentive stock option at a profit (if sales proceeds exceed the exercise price). The type of income will depend on when the participant sells the stock. If a participant sells the stock more than two years after the option was granted and more than one year after the option was exercised, then all of the profit will be long-term capital gain. If a participant sells the stock prior to satisfying these waiting periods, then the participant will have engaged in a disqualifying disposition and a portion of the profit will be ordinary income and a portion may be capital gain. This capital gain will be long-term if the participant has held the stock for more than one year and otherwise will be short-term. If a participant sells the stock at a loss (sales proceeds are less than the exercise price), then the loss will be a capital loss. This capital loss will be long-term if the participant held the stock for more than one year and otherwise will be short-term.

Non-statutory Stock Options. A participant will not have income upon the grant of a non-statutory stock option. A participant will have ordinary income upon the exercise of a non-statutory stock option equal to the value of the stock on the day the participant exercised the option less the exercise price. Upon sale of the stock, the participant will have capital gain or loss equal to the difference between the sales proceeds and the value of the stock on the day the option was exercised. This capital gain or loss will be long-term if the participant has held the stock for more than one year and otherwise will be short-term.

Stock Appreciation Rights. A participant will not have income upon the grant of a SAR. A participant will recognize ordinary income upon the exercise of a SAR equal to the amount of the cash and the fair market value of any stock received. Upon the sale of the stock, the participant will have capital gain or loss equal to the difference between the sales proceeds and the value of the stock on the day the SAR was exercised. This capital gain or loss will be long-term if the participant held the stock for more than one year and otherwise will be short-term.

Restricted Stock Awards. A participant will not have income upon the grant of restricted stock unless the participant voluntarily makes an election under Section 83(b) of the Code within 30 days of the date of grant. If a timely Section 83(b) election is made, then a participant will have ordinary income equal to the value of the stock on the date of grant less the purchase price. When the stock is sold, the participant will have capital gain or loss equal to the difference between the sales proceeds and the value of the stock on the date of grant, if a timely Section 83(b) election has been made.

If the participant does not make a Section 83(b) election, then when the stock vests (*i.e.,* the transfer restrictions and forfeiture provisions lapse) the participant will have ordinary income equal to the value of the stock on the vesting date less the purchase price. When the stock is sold, the participant will have capital gain or loss equal to the sales proceeds less the value of the stock on the vesting date, if no Section 83(b) election has been made. Any capital gain or loss will be long-term if the participant held the stock for more than one year following (i) the day after the grant date if a timely Section 83(b) election has been made or (ii) the day after the vesting date if no Section 83(b) election has been made, and otherwise will be short-term.

Restricted Stock Units. A participant will not have income upon the grant of an RSU. A participant is not permitted to make a Section 83(b) election with respect to an RSU award. When the RSU vests, the participant will have income on the vesting date in an amount equal to the amount of cash received or the fair market value of the stock on the vesting date less the purchase price, if any. When the stock is sold, the participant will have capital gain or loss equal to the sales proceeds less the value of the stock on the vesting date. Any capital gain or loss will be long-term if the participant held the stock for more than one year and otherwise will be short-term.

Other Stock- or Cashed-Based Awards and Performance Awards. The tax consequences associated with any other stock- or cashed-based award or performance award granted under the New Plan will vary depending on the specific terms of such award. Among the relevant factors are whether or not the award has a readily ascertainable fair market value, whether or not the award is subject to forfeiture provisions or restrictions on transfer, the nature of the property to be received by the participant under the award and the participant's holding period and tax basis for the award or underlying common stock.

Tax Consequences to the Company. There will be no tax consequences to us except that we will be entitled to a deduction when a participant has ordinary income. Any such deduction may be subject to the limitations of Sections 162(m) of the Code.

Board of Directors' Recommendation

The Board of Directors recommends that stockholders vote "FOR" the approval of Ribbon's 2019 Incentive Award Plan.

PROPOSAL 3 — RATIFICATION OF THE APPOINTMENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Audit Committee of the Board of Directors has appointed Deloitte & Touche LLP ("**Deloitte**") as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2019. Deloitte has acted as the independent registered accounting firm of Ribbon since the closing of the Merger, and of Sonus from August 2005 until the closing of the Merger. We are asking our stockholders to ratify this appointment. If this proposal is not approved at the 2019 Annual Meeting, our Audit Committee may consider this fact when it appoints our independent registered public accounting firm for the fiscal year ending December 31, 2020. Even if the proposal is approved at the 2019 Annual Meeting, the Audit Committee may, in its discretion, direct the appointment of a different independent registered public accounting firm at any time during the year if it determines that such change would be in the interests of the Company and its stockholders.

Representatives of Deloitte are expected to be present at the 2019 Annual Meeting and will have the opportunity to make a statement and be available to respond to appropriate questions by stockholders.

Deloitte Fees

The following is a summary and description of fees for services provided by Deloitte in 2018 and 2017:

Fee Category	2018	2017
Audit Fees	$1,586,871	$2,512,297
Audit-Related Fees	205,960	—
Tax Fees	120,666	127,639
All Other Fees	19,910	13,475
Total	$1,933,407	$2,653,411

Audit Fees. These amounts represent fees for the audit of our consolidated financial statements included in our 2018 Annual Report, the review of financial statements included in our Quarterly Reports on Form 10-Q, the audit of internal control over financial reporting and the services that an independent auditor would customarily provide in connection with subsidiary audits, statutory requirements, regulatory filing and similar engagements for the fiscal year, such as consents and assistance with review of documents filed with the SEC. Audit fees also include advice on accounting matters that may arise in connection with or as a result of the audit or the review of periodic consolidated financial statements and statutory audits that non-U.S. jurisdictions require. The 2017 amount includes $767,125 of fees incurred in connection with the Merger of Sonus and GENBAND and the filing of the related registration statement on Form S-4.

Audit-Related Fees. Audit-related fees consist of fees related to due diligence services and accounting consultations regarding the application of generally accepted accounting principles to proposed transactions.

Tax Fees. Tax fees consist of professional services for tax compliance, tax advice and tax planning. These services include assistance regarding federal, state and international tax compliance, value-added tax compliance, and transfer pricing advice and planning. Of this amount for fiscal 2018, $89,666 represents fees for tax compliance and preparation.

All Other Fees. All other fees consist of professional products and services other than the services reported above, including fees for our subscription to Deloitte's online accounting research tool.

Policy on Audit Committee Pre-Approval of Audit and Non-Audit Services

The Audit Committee had adopted a policy to pre-approve audit and permissible non-audit services provided by the independent registered public accounting firm. These services may include audit services, audit-related services, tax services and other services. Prior to engagement of the independent registered public accounting firm for the next year's audit, the independent registered public accounting firm and our management submit a list of services expected to be rendered during that year for each of the four categories of services to the Audit Committee for approval. Pre-approval is generally provided for up to one year and any pre-approval is detailed as to the particular service or category of services. The independent registered public accounting firm and our management periodically report to the Audit Committee regarding the extent of services provided by the independent registered public accounting firm in accordance with this pre-approval process. The Audit Committee may also pre-approve particular services on a case-by-case basis. The Audit Committee pre-approved all of the services and fees of Deloitte set forth above in accordance with such policy.

Our Audit Committee requires the regular rotation of the lead audit partner and concurring partner as required by Section 203 of the Sarbanes-Oxley Act of 2002 and is responsible for recommending to our Board policies for hiring employees or former employees of the independent registered public accounting firm. The Audit Committee has determined that the provision of services described above to us by Deloitte is compatible with maintaining Deloitte's independence.

Board of Directors' Recommendation

The Board of Directors recommends that stockholders vote "FOR" the ratification of the appointment of Deloitte & Touche LLP as our independent registered public accounting firm for 2019.

PROPOSAL 4 — APPROVAL, ON A NON-BINDING, ADVISORY BASIS, OF THE COMPENSATION OF OUR NAMED EXECUTIVE OFFICERS

The Board is dedicated to excellence in governance and is mindful of the interests our stockholders have in our executive compensation program. As part of that commitment and pursuant to the rules of the SEC, our stockholders are being asked to approve a non-binding advisory resolution on the compensation of our named executive officers. This proposal, which is typically called the "Say-on-Pay" proposal, offers stockholders the opportunity to express their opinions on our 2018 executive compensation program and policies for our named executive officers through the following resolution:

> "RESOLVED, that the stockholders of Ribbon Communications Inc. (the "**Company**") approve, on an advisory basis, the compensation paid to the Company's named executive officers as disclosed pursuant to the compensation disclosure rules of the U.S. Securities and Exchange Commission, including the "*Compensation Discussion and Analysis*" section and the accompanying compensation tables and the related narratives in the Proxy Statement for the Company's 2019 annual meeting of stockholders."

This vote is not intended to address any specific element of compensation, but rather the overall compensation policies and practices relating to the named executive officers. Even though the outcome of this advisory vote on the compensation of our named executive officers is non-binding, the Compensation Committee and the Board will, as they have done in prior years, take into account the outcome of this vote when making future compensation arrangements. The outcome of this advisory vote does not overrule any decision by the Company or the Board (or any committee thereof), create or imply any change to the fiduciary duties of the Company or the Board (or any committee thereof), or create or imply any additional fiduciary duties for the Company or the Board (or any committees thereof).

We believe that for the reasons summarized in the "*Compensation Discussion and Analysis*" section of this Proxy Statement, we have a compensation program deserving of stockholder support. Unless the Board modifies its policy regarding the frequency of holding "say on pay" advisory votes, such votes will take place every year and the next such vote will occur at the 2020 Annual Meeting.

Board of Directors' Recommendation

The Board of Directors recommends that stockholders vote "FOR" the approval, on a non-binding, advisory basis, of the compensation of our named executive officers.

CORPORATE GOVERNANCE AND BOARD MATTERS

We are committed to strong corporate governance practices, which include building long-term value for our stockholders and assuring the success of the Company for its stockholders and stakeholders, including employees, customers, suppliers and the communities in which we operate. To achieve these goals, our Board is charged with monitoring the performance of the Company and its officers as well as its programs and procedures to ensure compliance with law and our overall success. Governance is an ongoing focus at Ribbon, starting with the Board and extending to management and all employees. In addition, we solicit feedback from stockholders on governance and executive compensation practices in order to improve our practices.

We believe our governance practices are strong for the following reasons:

- ✔ Annual Election of Directors: ***Yes (no staggered board)***
- ✔ Majority Voting for Director Elections: ***Yes***
- ✔ Separate Chairman and CEO: ***Yes***
- ✔ Substantial Majority of Independent Directors: ***Yes***
- ✔ Independent Directors Meet without Management: ***Yes***
- ✔ Board with Wide Range of Experience and Skills: ***Yes***
- ✔ Annual Equity Grant to Non-Employee Directors: ***Yes***
- ✔ Annual Board and Committee Self-Evaluations: ***Yes***
- ✔ Annual Advisory Approval of Executive Compensation: ***Yes***
- ✔ Disclosure Committee for Financial Reporting: ***Yes***
- ✔ Review and Approval Policy for Related Party Transactions: ***Yes***
- ✔ Share Ownership Guidelines for our CEO, Certain Officers and our Non-Employee Directors: ***Yes***
- ✔ Clawback Policy for Recovering Incentive-Based Compensation Following an Accounting Restatement: ***Yes***
- ✔ Insider Trading Policy that Prohibits Hedging and Other Similar Actions for our Executive Officers and Directors: ***Yes***

Oversight of Risk Management

At Ribbon, we believe that innovation and leadership are impossible without taking risks. We also recognize that imprudent acceptance of risk or the failure to appropriately identify and mitigate risks could be destructive to stockholder value. The Board is responsible for assessing the Company's approach to risk management and overseeing management's execution of its responsibilities for identifying and managing risk. The Board exercises its responsibilities through discussions in Board meetings and also through its committees, each of which examines various components of enterprise risk as part of its responsibilities. Generally, strategic risks and the risks related to management delegation are overseen and evaluated by the full Board; financial, internal control and cybersecurity risks are overseen and evaluated by the Audit Committee; risks relating to our compensation policies are overseen and evaluated by the Compensation Committee; and risks related to governance are overseen and evaluated by the Nominating and Corporate Governance Committee. Each committee assesses identified risks and informs the Board about the risks as needed. Management also regularly reports on each such risk to the relevant committee or the Board. Moreover, an overall review of risk

is inherent in the Board's consideration of our long-term strategies and in the transactions and other matters presented to the Board, including capital expenditures, acquisitions and divestitures, and financial matters. Additional review or reporting on risks is conducted as needed or as requested by the Board or one of its committees. The Board believes that its role in the oversight of the Company's risks complements our current Board structure, as our structure allows our independent directors, through our three fully independent Board committees, to exercise effective oversight of the actions of management in identifying risks and implementing effective risk management policies and controls.

Board Composition and Stockholders Agreement

Our Board currently consists of eight directors, one of whom is employed by the Company (Mr. Hobbs). On October 27, 2017, in connection with the Merger, the Company entered into the Stockholders Agreement with the JPM Stockholders. The Stockholders Agreement provides, among other things, that: (i) for so long as the JPM Stockholders beneficially own at least 80% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the JPM Stockholders will have the right to designate five directors to serve on the Board, at least two of whom must be independent directors as defined in the Stockholders Agreement; (ii) from and after the first time that the JPM Stockholders beneficially own less than 80% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the number of directors that the JPM Stockholders will have the right to designate will be reduced to four, at least one of whom must be an independent director as defined in the Stockholders Agreement; (iii) from and after the first time that the JPM Stockholders beneficially own less than 70% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the number of directors that the JPM Stockholders will have the right to designate will be reduced to three, at least one of whom must be an independent director as defined in the Stockholders Agreement; (iv) from and after the first time that the JPM Stockholders beneficially own less than 50% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the number of directors that the JPM Stockholders will have the right to designate will be reduced to two, neither of whom need be an independent director as defined in the Stockholders Agreement; (v) from and after the first time that the JPM Stockholders beneficially own less than 30% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the number of directors that the JPM Stockholders will have the right to designate will be reduced to one, who does not need to be an independent director as defined in the Stockholders Agreement; and (vi) upon the first date that the JPM Stockholders beneficially own less than 10% of the common stock beneficially owned by the JPM Stockholders on the closing date of the Merger, the JPM Stockholders will have no board designation rights and the Company may, following a request of the majority of directors serving (other than those designated by the JPM Stockholders), require any designees of the JPM Stockholders to resign from the Board. The Stockholders Agreement further provides that the Nominating and Corporate Governance Committee will designate the Company's then-serving CEO as a director, as well as such additional number of directors as constitutes the full Board.

Director Independence

Our Corporate Governance Guidelines provide that, in determining the independence of a director, the Board will be guided by the definitions of "independent director" in the listing standards of Nasdaq and applicable laws and regulations as well as the definition of "independent director" set forth in the Stockholders' Agreement.

For purposes of the Stockholders Agreement, "independent director" means a person nominated or serving as a director on the Board who: (i) is independent for purposes of the rules of the Nasdaq and the SEC; (ii) does not then serve and has not served as a director, officer, partner or other senior-level employee (or other employee or consultant within the prior five years) of, and does not otherwise then receive (and has not at any time otherwise received) any material compensation from, any JPM Stockholder or any of its affiliates; and (iii) does not then serve (and has not at any time within the prior two years served) as a director, officer, employee or consultant of, and does not otherwise then receive (and has not at any time within the prior two years otherwise received) any compensation from, any portfolio company of any JPM Stockholder or any of its affiliates or any other third party that owns 15% or more of the Company's issued and outstanding common stock (as defined in the Stockholders Agreement). Certain qualifications and exclusions apply to the foregoing definition, and the Nominating and Corporate Governance Committee may waive certain of the foregoing independent director independence requirements in certain circumstances.

During its annual review of director independence, the Board considers all information it deems relevant, including without limitation, any transactions and relationships between each director or any member of his or her immediate family and the Company and its subsidiaries and affiliates. The Board conducted an annual review of director independence and affirmatively determined that each of Kim S. Fennebresque, Bruns H. Grayson, Beatriz V. Infante, Richard J. Lynch, Kent J. Mathy and Scott E. Schubert does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director, and that, as a result, each is an "independent director" as defined under Nasdaq Rule 5605(a)(2). The Board also conducted a review of director independence under the standards set forth in the Stockholders Agreement and determined that each of Kim S. Fennebresque, Bruns H. Grayson, Beatriz V. Infante, Richard J. Lynch, Kent J. Mathy and Scott E. Schubert is an "independent director" as defined in the Stockholders Agreement. Due to his role as our CEO, Franklin (Fritz) W. Hobbs does not qualify as an independent director. Due to his affiliation with the JPM Stockholders, Richard W. Smith does not qualify as an independent director under the Stockholders Agreement.

There are no family relationships among any of our directors, nominees for director and executive officers.

Meeting Attendance

Our Board recognizes the importance of director attendance at Board and committee meetings. Our Board held nine meetings during 2018, four of which were regular meetings and five of which were special meetings. Each of the directors attended at least 75% of the combined total meetings of the Board and its committees on which they served. While we do not have a formal policy regarding the attendance of directors at our annual meetings of stockholders, it is expected that, absent compelling circumstances, all of our directors will attend. All of the current members of the Board attended the Company's 2018 annual meeting of stockholders.

Board Committees

Our Board has three standing committees: the Audit Committee, the Compensation Committee, and the Nominating and Corporate Governance Committee. Each of the standing committees is composed entirely of independent directors as defined under applicable rules, including the Nasdaq rules and, in the case of all members of the Audit Committee, the independence requirements of Rule 10A-3 under the Exchange Act and, in the case of all members of the Compensation Committee, the heightened independence requirements for Compensation Committee members under the Nasdaq rules.

In June 2018, the Board dissolved the Integration Committee because it determined that such committee was no longer necessary and that it was in the best interests of the Company and its

stockholders to have the entire Board participate in discussions and decisions relating to the Company's integration efforts going forward.

Under the Stockholders Agreement, subject to the Company's obligation to comply with any applicable independence requirements under the Nasdaq rules and the rules of the SEC, for as long as the JPM Stockholders have the right to designate at least three directors to serve on our Board, at least one member of each of our Board's standing committees must be a designee of the JPM Stockholders. In addition, for so long as the JPM Stockholders have the right to designate at least one director who is an "independent director" as defined in the Stockholders Agreement, the Nominating and Corporate Governance Committee must consist of three directors, each of whom must be an "independent director" under the Stockholders Agreement and one of whom must be a designee of the JPM Stockholders.

Audit Committee. Our Board has established an Audit Committee consisting of three members: Messrs. Schubert (Chair) and Grayson and Ms. Infante. Our Board has determined that Mr. Schubert is an "audit committee financial expert" as defined in Item 407(d)(5) of Regulation S-K. This designation is a disclosure requirement of the SEC related to Mr. Schubert's experience and understanding with respect to certain accounting and auditing matters, but it does not impose upon Mr. Schubert any duties, obligations or liability that are greater than are generally imposed on him as a member of the Audit Committee and the Board, and his designation as an audit committee financial expert pursuant to this SEC requirement does not affect the duties, obligations or liability of any other member of the Audit Committee or the Board. The Audit Committee held six meetings during 2018.

As described more fully in its charter, the Audit Committee's responsibilities include, among other things: (i) appointing, evaluating, compensating, overseeing the work of and, if appropriate, terminating the appointment of the independent auditor; (ii) overseeing the Company's financial reporting, including reviewing and discussing with management, the independent auditor and a member of the internal audit function, prior to public release, the Company's annual and quarterly financial statements to be filed with the SEC; (iii) overseeing management's design and maintenance of the Company's internal control over financial reporting and disclosure controls and procedures; and (iv) reviewing and discussing with management and the independent auditor the Company's financial risk exposures and assessing the policies and procedures management has implemented to monitor and control such exposures. The Audit Committee operates pursuant to a written charter adopted by the Board that reflects standards and requirements adopted by the SEC and Nasdaq, a current copy of which is available at *www.ribboncommunications.com*, in the section entitled *Company—Investor Relations—Corporate Governance—Governance Highlights*.

Compensation Committee. The Compensation Committee consists of three members: Messrs. Fennebresque (Chair) and Grayson and Ms. Infante. The Compensation Committee held six meetings during 2018.

As described more fully in its charter, the Compensation Committee's responsibilities include, among other things: (i) reviewing and approving the Company's compensation plans, practices and policies for directors and executive officers, including a review of any risks arising from compensation practices and policies for employees that are reasonably likely to have a material adverse effect on the Company; (ii) reviewing the Company's succession plans for executive officers, where requested to do so by the Board; (iii) making recommendations to the Board regarding the establishment and terms of any incentive compensation or equity-based plans and monitoring their administration; and (iv) before selecting or receiving advice from a compensation advisor (other than in-house legal counsel), considering various factors relating to the independence of such advisor. The Compensation Committee may delegate its authority under its charter to one or more subcommittees or members of management, consistent with applicable law and SEC and Nasdaq rules. Specifically, the Compensation Committee may delegate to one or more executive officers of the Company the power to grant options or other stock awards pursuant to the Company's equity plans to certain employees of the Company.

The Compensation Committee operates pursuant to a written charter adopted by the Board that reflects standards and requirements adopted by Nasdaq, a current copy of which is available at *www.ribboncommunications.com*, in the section entitled *Company—Investor Relations—Corporate Governance—Governance Highlights*.

Nominating and Corporate Governance Committee. The Nominating and Corporate Governance Committee consists of three members: Messrs. Fennebresque (Chair), Lynch and Schubert. The Nominating and Corporate Governance Committee held five meetings during 2018.

As described more fully in its charter, the Nominating and Corporate Governance Committee's responsibilities include, among other things: (i) identifying, screening and reviewing individuals qualified to serve as directors, consistent with criteria approved by the Board, and recommending to the Board candidates for: (a) nomination for election by the stockholders and (b) any Board vacancies that are to be filled by the Board, subject to any rights regarding the selection of directors by holders of preferred shares and any other contractual or other commitments of the Company; (ii) developing and recommending to the Board, overseeing the implementation and effectiveness of, and recommending modifications as appropriate to, a set of corporate governance guidelines applicable to the Company; (iii) reviewing annually with the Board the composition of the Board as a whole and a succession plan in the event one or more directors ceases to serve for any reason; (iv) overseeing the annual self-evaluation of the Board, its committees, individual directors and management; and (v) identifying appropriate director development and continuing education opportunities and making recommendations to the Board as appropriate.

The Nominating and Corporate Governance Committee operates under a written charter adopted by the Board that reflects standards and requirements adopted by Nasdaq, a current copy of which is available at *www.ribboncommunications.com*, in the section entitled *Company—Investor Relations—Corporate Governance—Governance Highlights*.

Compensation Committee Interlocks and Insider Participation

During 2018, the members of the Compensation Committee were Messrs. Fennebresque (Chair) and Grayson and Ms. Infante, none of whom are or previously were officers or employees of the Company.

None of our executive officers serves as a member of the board of directors or compensation committee (or other committee performing equivalent functions) of any entity that has one or more executive officers serving on our Board or compensation committee.

Director Nomination Process

The Nominating and Corporate Governance Committee screens and recommends candidates for nomination by the full Board. There are no specific minimum qualifications for a recommended nominee to our Board; however, the Nominating and Corporate Governance Committee considers, among other skills and criteria, the following for nomination as a director: demonstrated business knowledge, technical skills and experience; an ability to exercise sound judgment in matters that relate to our current and long-term objectives; commitment to understanding us and our industry and to regularly attend and participate in meetings of our Board and its committees; a reputation for integrity,

honesty and adherence to high ethical standards; diversity of background and other desired qualities; the ability and experience to understand the sometimes conflicting interests of our various constituencies and to act in the interests of all stockholders; and the absence of any conflict of interest that would impair the nominee's ability to represent the interest of all our stockholders and to fulfill the responsibilities of being a director.

In considering whether to recommend any particular candidate for inclusion in our Board's slate of recommended director nominees, the Nominating and Corporate Governance Committee applies the criteria generally set forth in the Nominating and Corporate Governance Committee Charter. The process followed by the Nominating and Corporate Governance Committee to identify and evaluate director candidates includes requests to our Board members and others for recommendations, meetings from time to time to evaluate biographical information and background material relating to potential candidates and interviews of selected candidates by members of the Nominating and Corporate Governance Committee and our Board. Our Board believes that the backgrounds and qualifications of its directors, considered as a group, should provide a composite mix of experience, knowledge and abilities that will allow our Board to fulfill its responsibilities. In identifying potential director candidates, the Nominating and Corporate Governance Committee and the Board also focus on ensuring that the Board reflects a diversity of experiences, backgrounds and skills. The Nominating and Corporate Governance Committee has the authority to engage independent advisors to assist in the process of identifying and evaluating director candidates, but has not engaged any such advisors to date.

Stockholder Nominations and Recommendations of Director Candidates

Stockholders who wish to recommend candidates to the Nominating and Corporate Governance Committee for consideration as potential director candidates should send their recommendation to the Nominating and Corporate Governance Committee, c/o Corporate Secretary, Ribbon Communications Inc., 4 Technology Park Drive, Westford, MA 01886. In considering candidates submitted by stockholders, the Nominating and Corporate Governance Committee will take into consideration the current make-up of the Board, what skills should be added (if any) and the qualifications of the candidate. The Nominating and Corporate Governance Committee will consider director candidates recommended by stockholders in the same manner as candidates recommended by the Nominating and Corporate Governance Committee, as described above in "*Director Nomination Process.*"

Stockholders who wish to nominate director candidates or propose business to be considered directly at an annual meeting in accordance with the procedures set forth in our by-laws should follow the procedures set forth under the sections entitled "*Stockholder Nominations and Proposals For Presentation At 2020 Annual Meeting*."

Board Leadership Structure

The Company's Corporate Governance Guidelines provide that the Board leadership structure that is most appropriate for the Company at this time is a non-executive Chairman. The Board evaluates its leadership structure and role in risk oversight on an ongoing basis, and makes decisions on the basis of what it considers to be best for the Company at any given point in time. Currently, our Board leadership structure consists of an independent Chairman, a separate CEO and strong committee chairs. The Board believes its leadership structure provides for appropriate independence between the Board and management because the current leadership structure offers the following benefits: (i) increasing the independent oversight of Ribbon and enhancing our Board's objective evaluation of our CEO, (ii) focusing the CEO on company operations instead of Board administration,

(iii) providing the CEO with an experienced sounding board, (iv) providing greater opportunities for communication between stockholders and our Board, (v) enhancing the independent and objective assessment of risk by our Board, and (vi) providing an independent spokesperson for our Company.

Executive Sessions of the Board

The Company's Board is structured to promote independence and is designed so that independent directors exercise oversight of the Company's management and key issues related to strategy and risk. Under our Corporate Governance Guidelines, our independent directors are required to meet in executive session at regularly scheduled Board meetings without management present to discuss any matters the independent directors consider appropriate. We expect the Board to have a least four executive sessions each year.

Stock Ownership Guidelines

The Board believes that it is important to link the interests of our directors and management to those of our stockholders. Accordingly, our non-employee directors, our Chief Executive Officer and our other officers required to file reports under Section 16 of the Exchange Act are subject to a stock ownership policy. For additional information regarding our stock ownership policy, please see the section entitled "*Compensation Discussion and Analysis—Stock Ownership Requirements*" below.

Additional Governance Matters

Code of Ethics. Our Board has adopted a written Code of Conduct, which qualifies as a "code of ethics" as defined by SEC rules. The Code of Conduct is intended to provide guidance on the conduct expected of Ribbon's employees, officers and directors in the interests of preserving Ribbon's reputation for integrity, accountability and fair dealing. To ensure that our business is conducted in a consistently legal and ethical manner, our Code of Conduct applies to all of our directors, officers and employees.

We intend to disclose any amendment to or waiver of a provision of the Code of Conduct that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, by posting such information on our website at *www.ribboncommunications.com*.

Sustainability, Social and Environmental Responsibility. Ribbon has a mature sustainability program and an active environmental management system ("**EMS**"). This is highlighted by our continuous ISO 14001 certification since 2010 for our major North American and European sites and our compliance with international laws relating to environmental management. In our Environmental Policy, we state our commitment to: (i) protecting the environment and preventing pollution within our products' lifecycle with responsible product design and by requiring our suppliers to adhere to sustainable practices, (ii) fulfilling our compliance obligations by complying with all applicable environmental legislation and other requirements, and (iii) continually improving our EMS to enhance environmental performance.

We implement administrative controls to assess our compliance obligations, processes and practices, and to identify opportunities for reductions in energy use, carbon emissions and waste. We also take appropriate measures to meet the following objectives: (i) reduce and optimize our consumption of nature resources, (ii) prevent hazardous and/or banned substances from entering our products, and (iii) recycle those materials required for operations in the global marketplace. The Company takes its corporate social responsibilities seriously, as evidenced through its publicly available

statement on slavery and human trafficking as well as its published Supplier Code of Conduct. Ribbon demonstrates leadership in environmental management to all of our suppliers through our ISO 14001 certification and ensuring that in all of our business dealings, we comply with applicable national and international legislation and human rights. Our company policy documents are available at *https://ribboncommunications.com/company/company-policies-1.*

Public Availability of Corporate Governance Documents. For more corporate governance information, you are invited to access our key corporate governance documents, including our Corporate Governance Guidelines, Code of Conduct and the charters of our Audit Committee, Compensation Committee, and Nominating and Corporate Governance Committee on our corporate website at *www.ribboncommunications.com*, in the section entitled *Company—Investor Relations—Corporate Governance—Governance Highlights* or in print, free of charge, if you request them from our corporate secretary at Ribbon Communications Inc., 4 Technology Park Drive, Westford, Massachusetts 01886, Attention: Corporate Secretary. The references in this Proxy Statement to our corporate website are not intended to, and do not, incorporate by reference into this Proxy Statement any materials contained on such website.

Stockholder Communications with the Board of Directors. Stockholders may communicate with our Board by writing, calling or e-mailing our Investor Relations Department at Ribbon Communications Inc., 4 Technology Park Drive, Westford, MA 01886, Attention: Investor Relations, (978) 614-8440, *ir@rbbn.com.* Our Investor Relations Department will review all such communications and will forward to the Chairman of the Audit Committee all communications that raise an issue appropriate for consideration by our Board.

AUDIT COMMITTEE REPORT

The information contained in this report shall not be deemed to be "soliciting material" or "filed" or incorporated by reference in future filings with the U.S. Securities and Exchange Commission, or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended, except to the extent that we specifically request that it be treated as soliciting material or specifically incorporate it by reference into a document filed under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

We reviewed Ribbon's audited financial statements for the fiscal year ended December 31, 2018 and discussed these financial statements with Ribbon's management, including a discussion of the quality, not just the acceptability, of the accounting principles, the reasonableness of significant judgments and the clarity of disclosures in the financial statements. Ribbon's management is responsible for Ribbon's financial reporting process, including its system of internal controls, and for the preparation of consolidated financial statements in accordance with generally accepted accounting principles. Ribbon's independent registered public accounting firm, Deloitte & Touche LLP ("**Deloitte**"), is responsible for performing an independent audit of Ribbon's financial statements in accordance with standards of the Public Company Accounting Oversight Board (United States) ("**PCAOB**") and issuing a report on those financial statements and issuing a report on the effectiveness of Ribbon's internal control over financial reporting as of the end of the fiscal year. Our responsibility is to monitor and review these processes. We also reviewed and discussed with Deloitte the audited financial statements and the matters required by SEC Regulation S-X Rule 2-07 and AS No. 1301, Communications with Audit Committees.

Deloitte provided us with, and we reviewed, the written disclosures and the letter required by PCAOB Ethics and Independence Rule 3526, Communications with Audit Committees Concerning Independence. This rule requires independent registered public accounting firms annually to disclose in writing all relationships that in the independent registered public accounting firm's professional opinion may reasonably be thought to bear on independence, to confirm their independence and to engage in a discussion of independence. In addition to engaging in this discussion with Deloitte regarding its independence, we also considered whether Deloitte's provision of other, non-audit related services to Ribbon is compatible with maintaining Deloitte's independence.

Based on our discussions with management and Deloitte, and our review of information provided by management and Deloitte, we recommended to the Ribbon Board of Directors that the audited financial statements be included in Ribbon's Annual Report on Form 10-K for the year ended December 31, 2018.

Submitted by,
AUDIT COMMITTEE:
Scott E. Schubert (Chairman)
Bruns H. Grayson
Beatriz V. Infante

DIRECTOR COMPENSATION

The Compensation Committee reviews the compensation of our non-employee directors periodically and recommends changes to the Board when it deems appropriate. The following table describes the components of the non-employee directors' compensation for 2018:

Compensation Element	*Compensation Payment*
Annual Retainer	$60,000+
Annual Equity Retainer	$120,000+ in shares of restricted stock that vest after one year (or, if earlier, on the date of the next annual meeting if the non-employee director does not stand for re-election or is not re-elected by stockholders of the Company))
Committee Fees*	$15,000 for the Audit Committee $10,000 for the Compensation Committee $5,000 for the Nominating and Corporate Governance Committee $5,000 for the Integration Committee++
Chair Fee	$100,000 for the Non-Executive Chairman of the Board* $25,000 for the Audit Committee** $17,000 for the Compensation Committee** $10,000 for the Nominating and Corporate Governance Committee** $10,000 for the Integration Committee**,++
New Director Equity Award (one-time grant)	$180,000+ in shares of restricted stock that vest after one year
Stock Ownership Guidelines	Ownership of common stock that has a value equivalent to five times the annual cash retainer; to be satisfied on or before October 27, 2022 for current directors or within five years of joining the Board for future directors

* Compensation for service as the chairman of the Board or a committee member is in addition to the compensation paid for Board service.

** Compensation for service as a committee chair is in addition to the compensation paid for service on such committee.

+ Mr. Smith is not entitled to any annual director equity grants. In lieu of such grants, Mr. Smith's annual retainer is $160,000. All compensation paid to Mr. Smith is paid directly to Heritage PE (OEP) III L.P. ("**Heritage III**").

++ The Board dissolved the Integration Committee in June 2018. However, compensation for service on the Integration Committee was paid in full for 2018.

Total Director Compensation for 2018

The following table contains information on compensation earned by each non-employee member of our Board during 2018:

2018 Director Compensation

Director	Fees Earned or Paid in Cash ($)	Stock Awards ($)(1)	Total ($)(2)
Kim S. Fennebresque	102,000	120,001	222,001
Bruns H. Grayson	90,000	120,001	210,001
Beatriz V. Infante	85,000	120,001	205,001
Richard J. Lynch	165,000	120,001	285,001
Kent J. Mathy	75,000	120,001	195,001
Scott E. Schubert	110,000	120,001	230,001
Richard W. Smith(3)	160,000	—	160,000

(1) The amounts in this column do not reflect compensation actually received by the applicable director. Instead, the amounts reflect the grant date fair value of restricted stock awards, as calculated in accordance with Accounting Standards Codification 718, *Compensation—Stock-Based Compensation* ("**ASC 718**").

The $120,001 reported for each member of the Board, with the exception of Mr. Smith, represents the grant date fair value of his or her 2018 Ribbon Director Grant of 18,162 shares of restricted stock, which shares were granted on June 15, 2018 and which will vest on June 15, 2019.

As of December 31, 2018, our non-employee directors held an aggregate of 260,358 unvested shares of our common stock as follows:

Non-Employee Directors	Number of Unvested Shares Held as of 12/31/18
Kim S. Fennebresque	43,393
Bruns H. Grayson	43,393
Beatriz V. Infante	43,393
Richard J. Lynch	43,393
Kent J. Mathy	43,393
Scott E. Schubert	43,393
Richard W. Smith	—

(2) Non-employee directors also are eligible to be reimbursed for reasonable out-of-pocket expenses incurred in connection with attendance at our Board or committee meetings.

(3) Mr. Smith is not entitled to any equity compensation in connection with his services as a member of the Board. Fees paid to Mr. Smith included herein represent annual director fees, consistent with other non-employee directors, and additional fees in lieu of the 2018 annual director grant. More specifically, Mr. Smith's cash compensation for 2018 includes $100,000 of cash that was paid quarterly in arrears in lieu of his 2018 Ribbon Director Grant. All compensation for Mr. Smith's services is paid directly to Heritage III.

EXECUTIVE OFFICERS OF THE REGISTRANT

The executive officers of the Company as of the date hereof are listed below:

Name	Age	Position
Franklin (Fritz) W. Hobbs	71	President and Chief Executive Officer
Daryl E. Raiford	56	Executive Vice President and Chief Financial Officer
Steven Bruny	61	Executive Vice President, Global Sales & Services
Justin K. Ferguson	41	Executive Vice President, General Counsel and Corporate Secretary
Patrick Joggerst	61	Chief Marketing Officer and Executive Vice President, Business Development
John McCready	55	Executive Vice President and Chief Strategy Officer
Kevin Riley	48	Executive Vice President, Chief Technology Officer and Advanced R&D
Anthony Scarfo	58	Executive Vice President, Products, R&D, Support & Supply Chain

Biographical information regarding each executive officer other than Franklin (Fritz) W. Hobbs is set forth below. Mr. Hobbs' biographical information is set forth above under the section entitled "*Proposal 1—Election of Directors*."

Daryl E. Raiford has served as our Executive Vice President and Chief Financial Officer since October 2017. He previously served in the same position at GENBAND since 2010, and was responsible for global financial, business operations and supply chain functions. Between 2007 and 2010, Mr. Raiford served as Vice President and Chief Accounting Officer and then as Vice President of Business Transformation at Freescale Semiconductor, which was headquartered in Austin, Texas. From 2004 through 2007, Mr. Raiford was Executive Vice President and Chief Financial Officer of Travelport Worldwide Limited, and was responsible for the global financial, communications, product management, information technology, and general administrative functions of this UK-based global travel distribution firm. Before Travelport, Mr. Raiford served as Vice President, Finance and Administration, Americas for Hewlett Packard between 2002 and 2004, and as Corporate Controller for Compaq Computer Corporation from 1999 until its acquisition by Hewlett Packard in 2002. He also was the Chief Financial Officer for Shell Technology Ventures, based in Houston, Texas and The Hague, Netherlands. Mr. Raiford served for ten years at the accounting firm Price Waterhouse in London and Houston, and is a Certified Public Accountant. Effective February 2019, Mr. Raiford was appointed to serve on the Board of Directors and as Chair of the Audit Committee of Leone Media Inc., a global media technology company that acquired Ericsson's Media Solutions business and which operates under the trade name MediaKind. He earned a Bachelor of Business Administration degree in Accounting from The University of Texas at Austin. In 2012, Mr. Raiford was honored as a finalist for the Outstanding CFO, Private Company by D CEO Magazine.

Steven Bruny has served as our Executive Vice President, Global Sales & Services since January 2019. He previously served as our Executive Vice President, Global Operations from October 2017 to January 2019; as Chief Operating Officer of GENBAND from January 2015 to October 2017; and as Senior Vice President of Major Accounts Sales for GENBAND from July 2012 to January 2015. Prior to joining GENBAND, from July 2005 to March 2012, Mr. Bruny served as Chief Executive Officer of Aztek Networks, Inc., a telecommunications company, which was acquired by GENBAND in 2012. Prior to joining Aztek Networks, Inc., in 1999, Mr. Bruny co-founded Connexn Technologies, Inc., a telecommunications company, which was acquired by Azure Solutions, Ltd., in 2004. Prior to his position at Connexn Technologies, Inc., Mr. Bruny was Founder and CEO of IGS, a telecommunications software supplier, from 1993 to 1998. From 1988 to 1993, Mr. Bruny was also Founder and CEO of Information + Graphics Systems, Inc., a GIS software provider that was acquired by Hitachi Software Engineering in 1993. Mr. Bruny holds a Bachelor of Science degree in Physics from Colorado State University and a Master of Business Administration degree from the University of Colorado.

Justin K. Ferguson has served as Executive Vice President, General Counsel and Corporate Secretary since April 2018. Prior to joining Ribbon, from 2015 to 2018, Mr. Ferguson was the Vice President, General Counsel and Corporate Secretary of Zix Corporation, a Nasdaq listed company that provides email security solutions. From 2011 to 2015, Mr. Ferguson served as Senior Vice President—Director of Legal for GENBAND. Prior to GENBAND, he was an attorney at the law firms of Weil, Gotshal & Manges LLP and Baker Botts L.L.P. Mr. Ferguson received a Juris Doctorate degree from Texas Tech University School of Law and a Bachelor's degree in Business Administration from Texas Tech University. He is a member of the State Bar of Texas.

Patrick Joggerst has served as our Chief Marketing Officer and Executive Vice President, Business Development since October 2017. He joined GENBAND in March 2015 as Executive Vice President and Chief Marketing Officer and in January 2016 became Executive Vice President of Global Sales and Marketing. Prior to that, Mr. Joggerst served as Vice President of Global Sales for BroadSoft, Inc., a software company, from August 2012 to September 2014. Mr. Joggerst was the Executive Vice President and General Manager for the Carrier Services & Solutions business unit at Aricent Group, a software company, from September 2009 to July 2012. Earlier positions held by Mr. Joggerst include: Senior Vice President of Worldwide Sales at NextPoint Networks (formerly NexTone), a software company, from January 2007 to September 2008, Executive Vice President of Global Sales and Marketing at Telcordia Technologies, a telecommunications software company, from October 2002 to January 2006, President of PrimeCo Personal Communications, L.P., a wireless telecommunications provider, from January 2002 to August 2002, President of Carrier Service at Global Crossing, a telecommunications company, from February 1998 to December 2001, as well as several executive positions at AT&T, a telecommunications company, from February 1981 to January 1998. Mr. Joggerst is a graduate of Georgetown University's School of Foreign Service.

John McCready has served as our Chief Strategy Officer since October 2017. Previously, he served as GENBAND's Executive Vice President, Products and Corporate Development since July 2013. Prior to this role, Mr. McCready was a Senior Vice President responsible for the Product Management organization from May 2010 until July 2013. Mr. McCready held leadership roles at Nortel Networks Corporation, a telecommunications manufacturer, in Wireless Networks, Carrier Multimedia Networks and Carrier Data Networks between January 2007 and May 2010 and between September 1991 and August 2001. Prior to that, Mr. McCready led the Marketing and Carrier Sales organizations at SavaJe Technologies Inc., a software developer, which was acquired by SUN Microsystems, now a wholly-owned subsidiary of Oracle Corporation. From August 2001 to February 2005, Mr. McCready was Vice President of Marketing at Phonetic Systems Ltd., which was acquired by Nuance Communications in 2005. Mr. McCready holds a Bachelor of Science degree in Electrical Engineering from the University of Calgary and a Master of Business Administration degree from the Ivey School of Business at the University of Western Ontario.

Kevin Riley has served as our Executive Vice President, Chief Technology Officer and Advanced R&D since October 2017 and was Sonus' Senior Vice President, Engineering and Operations and Chief Technology Officer from February 2016 until the Merger. Previously, Mr. Riley served as Sonus' Vice President, Engineering and Chief Technology Officer from July 2014 to January 2016; Vice President of Platform Engineering from October 2012 to July 2014; and a Sonus Fellow from May 2011 to September 2012. Prior to joining Sonus, he was the Software Development Director at Verivue, Inc., a

content delivery network software company, from August 2009 to May 2011. Mr. Riley holds a Bachelor of Science degree in Electrical Engineering from the University of Massachusetts, Amherst and a Master of Science degree in Electrical Engineering from Northeastern University.

Anthony Scarfo has served as our Executive Vice President, Products and R&D since January 2018. From October 2016 to January 2018, he consulted for VTCSecure, a global communications solutions company. He has also served on the advisory board of VTCSecure since 2012. From October 2017 to January 2018, he was a consultant for the Visiting Nurse Association Health Group, helping to launch a new company focused on helping people age in place. Mr. Scarfo was previously Sonus' Executive Vice President, Services, Product Management and Corporate Development from October 2013 to October 2016; Senior Vice President, Technology Development from May 2012 to October 2013; Vice President and General Manager of Trunking, Policy and Business Development from February 2012 to May 2012; and Vice President of Business Development from September 2011 to February 2012. Prior to joining Sonus, Mr. Scarfo was the Vice President of Global Services Providers and System Integrators at Polycom, Inc., a leader in open, standards-based unified communications and collaboration solutions for voice and video collaboration, from February 2010 to May 2011, where he was responsible for developing Polycom, Inc.'s cloud strategy to deploy video and voice infrastructure for Managed and Hosted Unified Communication services. Previously, Mr. Scarfo was the Chief Strategy Officer and Head of Global Channels at ECI Telecom, which delivers communications platforms to carriers and services providers worldwide, from July 2006 to January 2010, where he led the development of a multi-faceted business strategy and developed a partner program with strategic and original equipment manufacturer partners. He also served as Vice President of Global Alliances and Partnerships at Juniper Networks, Inc., which designs, develops and sells network infrastructure products and services, from July 2002 to June 2006. Mr. Scarfo started his career at AT&T Inc., a premier communications holding company, and held leadership roles at Lucent Technologies, which designed and delivered systems, services and software for next-generation communications networks. Mr. Scarfo holds a Bachelor of Science degree in computer information systems from Manhattan College and a Master of Business Administration degree from Seton Hall University.

BENEFICIAL OWNERSHIP OF OUR COMMON STOCK

The following table sets forth information regarding beneficial ownership of our common stock as of April 8, 2019 by:

- each person who beneficially owns, to the best of our knowledge, more than 5% of the outstanding shares of our common stock;
- each of our named executive officers;
- each of our directors; and
- all of our current executive officers and directors as a group.

Beneficial ownership is determined in accordance with the rules of the SEC, and includes voting or investment power with respect to shares. In computing the number of shares beneficially owned by each person named in the following table and the percentage ownership of that person, shares of common stock that the person has the right to acquire within 60 days of April 8, 2019, through the exercise of any stock option or other equity right, are deemed owned by that person and are also deemed outstanding. These shares are not, however, deemed outstanding for purposes of computing the percentage ownership of any other person.

Unless otherwise indicated below, to our knowledge, all persons named in the table have sole voting and investment power with respect to their shares of common stock, except to the extent authority is shared by spouses under applicable law. The percentage of common stock outstanding as of April 8, 2019 is based upon 111,390,821 shares of common stock outstanding on that date, including unvested shares of restricted stock.

Name and Address of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Common Stock Outstanding
Named Executive Officers:		
Franklin (Fritz) W. Hobbs	217,930	*
Daryl E. Raiford(1)	191,399	*
Steven Bruny(2)	105,190	*
Michael Swade(3)	202,050	*
Anthony Scarfo(4)	70,699	*
Non-Employee Directors:		
Kim S. Fennebresque(5)	54,076	*
Bruns H. Grayson(5)	154,076	*
Beatriz V. Infante(5)	120,929	*
Richard J. Lynch(5)	117,408	*
Kent J. Mathy(5)	54,076	*
Scott E. Schubert(5)	116,036	*
Richard W. Smith	—	—
All current executive officers and directors as a group (15 persons)(6)	1,847,260	1.66%
5% Owners:		
JPMorgan Chase & Co.(7)	49,940,222	44.83%

* Less than 1% of the outstanding shares of common stock.

(1) Includes 64,555 shares of restricted stock subject to vesting, of which 16,139 shares will vest within 60 days of April 8, 2019.

(2) Includes 50,555 shares of restricted stock subject to vesting, of which 12,639 shares will vest within 60 days of April 8, 2019.

(3) Mr. Swade stepped down as our Executive Vice President, Global Sales, effective January 14, 2019. Mr. Swade remained with the Company through March 31, 2019 to assist with the transition of his responsibilities to Mr. Bruny.

(4) Includes 49,999 shares of restricted stock subject to vesting, of which no shares will vest within 60 days of April 8, 2019.

(5) Includes 18,182 shares of restricted stock subject to vesting, of which no shares will vest within 60 days of April 8, 2019.

(6) Includes 443,391 shares of restricted stock subject to vesting, of which 54,056 will vest within 60 days of April 8, 2019, owned by our current directors and officers. Each of our current directors and executive officers may be reached at 4 Technology Drive, Westford, Massachusetts 01886.

(7) Based solely on a Schedule 13D/A filed with the SEC on December 7, 2018, reporting the beneficial ownership of 49,940,222 shares of our common stock. JPMorgan Chase & Co. ("**JPMorgan Chase**") reported shared voting and dispositive power with respect to all 49,940,222 shares, JPMC Heritage Parent LLC ("**JPMC Heritage**") reported shared voting and dispositive power with respect to 48,190,718 shares, OEP III Co-Investors, L.P. ("**OEP III Co-Investors**") reported shared voting and dispositive power with respect to zero shares, OEP II Partners Co-Invest, L.P. ("**OEP II Partners Co-Invest**") reported shared voting and dispositive power with respect to 1,749,504 shares, and Heritage PE (OEP) III, L.P. ("**Heritage III**") reported shared voting and dispositive power with respect to 47,048,711 shares. JPMorgan Chase, JPMC Heritage, OEP III Co-Investors, OEP II Partners Co-Invest and Heritage III are collectively referred to as the "JPMorgan Reporting Persons". JPMorgan Chase is a publicly traded entity listed on the New York Stock Exchange, which is the sole member of JPMorgan Holdings LLC, which is the sole member of Banc One Financial LLC, which is the sole member of OEP Holdings LLC, which is the sole member of JPMC Heritage, which is the general partner of OEP General Partner III L.P., which is the general partner of Heritage III. As such, each of OEP Holding LLC, JPMC Heritage and OEP General Partner III L.P. may be deemed to have or share beneficial ownership of the common stock held directly by Heritage III. OEP II Partners Co-Invest is subject to certain contractual agreements and statutory obligations to acquire and vote shares side-by-side with Heritage III. By virtue of these agreements and obligations, JPMorgan Chase may be deemed to have or share beneficial ownership over the shares held directly by OEP II Partners Co-Invest. Notwithstanding the above, JPMorgan Chase does not directly or indirectly own any interest in OEP II Partners Co-Invest. The business address of OEP II Partners Co-Invest is 510 Madison Ave., 19th Floor, New York, NY 10022. The business address of each of the other JPMorgan Reporting Persons is 270 Park Avenue, 10th Floor, New York, NY 10017.

SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Exchange Act requires our officers (as defined under Rule 16a-1(f) under the Exchange Act), directors and persons who beneficially own more than 10% of our common stock to file reports of initial ownership and subsequent changes in that ownership with the SEC. Based solely on a review of the copies of reports furnished to us and the written representations of our directors and officers, we believe that all of Ribbon's directors, officers and greater than 10% stockholders complied with all Section 16(a) filing requirements, except that one Form 4 for Franklin (Fritz) W. Hobbs reporting one transaction was filed late.

TRANSACTIONS WITH RELATED PERSONS

The Board adopted a written related person transaction policy, which sets forth our policies and procedures for the review, approval or ratification of any transaction required to be reported in our filings with the SEC. Under the policy, any potential related person transactions must be reported to our general counsel, who is responsible for determining whether such transactions constitute related person transactions subject to the policy. Our general counsel is required to present to the Audit Committee each proposed related person transaction. The Audit Committee may approve or ratify the transaction only if the Audit Committee determines that, under all of the circumstances, the transaction is in the best interests of the Company and its stockholders, as the Audit Committee determines in good faith. The Audit Committee may, in its sole discretion, impose such conditions as it deems appropriate on the Company or the related person in connection with approval of the related person transaction. If the Audit Committee does not approve or ratify a related person transaction, such transaction will not be entered into or will be terminated, as the Audit Committee directs.

Other than as described below and the compensation arrangements described elsewhere in this Proxy Statement, since January 1, 2018, there has not been, and there is not currently proposed, any transaction or series of similar transactions (i) to which we were or will be a participant, (ii) in which the amount involved exceeded or will exceed $120,000, and (iii) in which any director, executive officer or a holder of five percent or more of any class of our capital stock or any member of their immediate family had or will have a direct or indirect material interest.

Stockholders Agreement

On October 27, 2017, in connection with the Merger, the Company entered into a Stockholders Agreement with the JPM Stockholders. The Stockholders Agreement provides the JPM Stockholders with certain Board and Board committee designation rights as described above under "*Corporate Governance—Board Composition and Stockholders Agreement*" and "*Corporate Governance—Board Committees,*" and contains certain voting commitments as described in "*Proposal 1—Election of Directors*".

The Stockholders Agreement contains certain standstill provisions restricting the JPM Stockholders from acquiring (or seeking or making any proposal or offer with respect to acquiring) additional common stock or any security convertible into common stock or any assets, indebtedness or businesses of the Company or any of its subsidiaries. Certain customary exclusions apply, and acquisitions of common stock by the JPM Stockholders will be permitted in open market acquisitions during open trading windows, following the determination of a majority of the Company's independent directors (as defined by the Stockholders Agreement) not to cause the Company to repurchase a material amount of common stock during such trading window. These restrictions are subject to certain customary exclusions. The standstill restrictions apply from the date of the Stockholders Agreement until the earlier of the acquisition of the Company by a third party in a change of control transaction as discussed in further detail below and when the JPM Stockholders no longer have any rights to nominate or designate nominees to the Board.

Without the approval of a majority of the independent directors (as defined by the Stockholders Agreement), no JPM Stockholder may enter into or affirmatively support any transaction resulting in a change of control of the Company in which any JPM Stockholder receives per share consideration as a holder of common stock in excess of that to be received by other holders of common stock.

Until three years following the effective time of the Merger, except as otherwise approved by a majority of the Company's independent directors (as defined by the Stockholders Agreement) or as may be required as a result of a Regulatory Requirement (as defined by the Stockholders Agreement), no JPM Stockholder may transfer any voting stock that it beneficially owns if such transfer involves more than 15% of the outstanding voting stock or if the transferee would own 15% of the outstanding voting stock following such transfer, unless the transferee agrees to be subject to the Stockholders Agreement.

The Stockholders Agreement will terminate by mutual consent of a majority in interest of the JPM Stockholders and the Company (including the approval by a majority of the Company's independent directors (as defined by the Stockholders Agreement)) or when the JPM Stockholders, in the aggregate, beneficially own less than 2% of the issued and outstanding common stock.

Registration Rights Agreement

On October 27, 2017, in connection with the Merger, the Company entered into a registration rights agreement with the JPM Stockholders (the "**Registration Rights Agreement**"). Under the Registration Rights Agreement, the JPM Stockholders were granted certain registration rights beginning on the 180th day following the consummation of the Merger, including (i) the right to request that the Company file an automatic shelf registration statement and effect unlimited underwritten offerings pursuant to such shelf registration statement; (ii) unlimited demand registrations; and (iii) unlimited piggyback registration rights that allow holders of registrable shares to require that shares of Company common stock owned by such holders be included in certain registration statements filed by the Company, in each case subject to the transfer restrictions contained in the Stockholders Agreement. In connection with these registration rights, the Company has agreed to effect certain procedural actions, including taking certain actions to properly effect any registration statement or offering and to keep the participating JPM Stockholders reasonably informed with adequate opportunity to comment and review, as well as customary indemnification and contribution agreements.

Promissory Note

In connection with the Merger, on October 27, 2017, the Company issued a promissory note for $22.5 million to certain former equity holders of GENBAND, including certain affiliates of the JPM Stockholders (the "**Promissory Note**"). The Promissory Note does not amortize and the principal thereon is payable in full on the third anniversary of its execution. Interest on the Promissory Note is payable quarterly in arrears and accrues at a rate of 7.5% per year for the first six months after issuance, and thereafter at a rate of 10% per year. The failure to make any payment under the Promissory Note when due and, with respect to payment of any interest, the continuation of such failure for a period of thirty days thereafter, constitutes an event of default under the Promissory Note. If an event of default occurs under the Promissory Note, the payees may declare the entire balance of the Promissory Note due and payable (including principal and accrued and unpaid interest) within five business days of the payees' notification to the Company of such acceleration. At December 31, 2018, the Promissory Note balance was $24.1 million, comprised of $22.5 million of principal plus $1.6 million of interest converted to principal.

COMPENSATION COMMITTEE REPORT

The information contained in this report shall not be deemed to be "soliciting material" or "filed" or incorporated by reference in future filings with the U.S. Securities and Exchange Commission, or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended, except to the extent that we specifically request that it be treated as soliciting material or specifically incorporate it by reference into a document filed under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

The Compensation Committee consists of Kim S. Fennebresque (Chairman), Bruns H. Grayson and Beatriz V. Infante. The Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis required by Item 402(b) of Regulation S-K with our management. Based on this review and discussion, the Compensation Committee recommended to our Board of Directors that the Compensation Discussion and Analysis be included in this Proxy Statement.

Submitted by,
COMPENSATION COMMITTEE:
Kim S. Fennebresque (Chairman)
Bruns H. Grayson
Beatriz V. Infante

COMPENSATION DISCUSSION AND ANALYSIS

The following discussion and analysis contain statements regarding performance targets and goals of the Company. These targets and goals are discussed in the limited context of our compensation programs and should not be understood to be statements of management's expectations or estimates of results or other guidance. Investors should not apply these statements to other contexts.

Overview

This section explains our compensation philosophy, describes the material components of our executive compensation program for our named executive officers ("**NEOs**"), whose compensation is set forth in the 2018 Summary Compensation table and other compensation tables contained in this Proxy Statement, and provides an overview of our executive compensation philosophy and program.

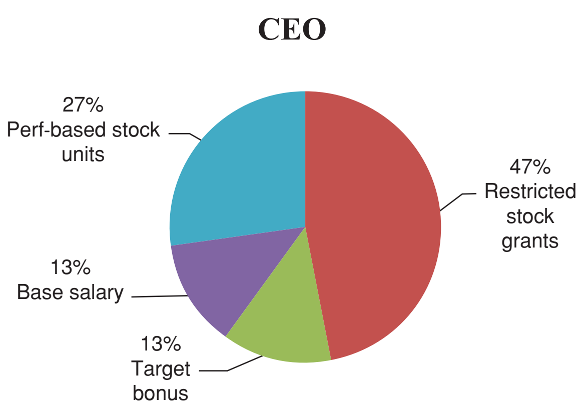
2018 Named Executive Officers

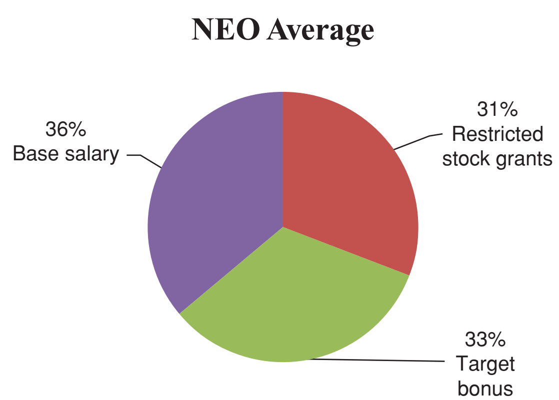
- **Franklin (Fritz) W. Hobbs**, *our President and Chief Executive Officer*
- **Daryl E. Raiford**, *our Executive Vice President and Chief Financial Officer*
- **Steven Bruny**, *our Executive Vice President, Global Sales and Services*
- **Anthony Scarfo**, *our Executive Vice President, Products, Research and Development, Support and Supply Chain*
- **Michael Swade**, *our former Executive Vice President, Global Sales*

Executive Summary of 2018 Executive Compensation Decisions

We believe that our executive compensation program supports our business strategies and talent management objectives and is consistent with sound governance practices that are intended to best serve our stockholders' long-term interests. In making its compensation decisions for 2018, the Compensation Committee considered, among other things, our financial and operational results for the year, the result of the say-on-pay vote at the 2018 annual meeting of stockholders, and the achievement of the compensation objectives set by the Compensation Committee. The components of the NEOs' 2018 compensation and the key decisions underlying such components are described below:

2018 Target Compensation Components of CEO and Other Named Executive Officers (as a Percentage of Total Direct Compensation)





Our senior executives are responsible for achieving both short- and long-term performance goals critical to our long-term success. Accordingly, compensation is weighted more heavily towards rewarding variable compensation as an individual rises within the organization as evidenced by the fact that at least 50% of the total direct compensation of each NEO and 87% of the CEO, was comprised of target bonus and equity awards.

Executive Compensation Highlights

In 2018, the Company reviewed and updated its pay practices to align with the combined goals and objectives of the post-Merger business and adopt good pay practices from both Sonus and GENBAND, where appropriate, to reflect the Company's strong governance and pay for performance compensation philosophy. Some of the highlights of our compensation programs and practices are as follows:

- ***Increased emphasis on key elements of the business through linkage to performance-based long-term incentives.*** The Company redesigned its long-term incentive program for 2018 to introduce a new performance-based stock unit ("**PSUs**") program for our CEO. Such program placed greater emphasis on the use of performance-based long-term incentives in the long-term incentive program while maintaining a retentive effect of a three-year vesting period. For 2018, the compensation mix for our CEO was weighted to performance-based compensation, with PSUs representing approximately 27% of his total direct compensation, RSUs representing approximately 47% of his total direct compensation, and target bonus and base salary, each representing approximately 13% of his total direct compensation.

- ***Redesigned PSU component for 2019 and granted to all executive officers.*** For 2019, we granted PSUs to our executive officers, including our CEO, with vesting based upon (i) attainment of growth (annual pre-bonus adjusted EBITDA) and results of our stock performance (the Company's total shareholder return ("**TSR**") relative to the TSR of certain companies included in the Russell 2500 Telecommunications Sub Sector Index at the time of grant for a three-year period) and (ii) continued employment for three years after the grant date of the PSUs.

- ***Updated Peer Group.*** The Compensation Committee, together with its compensation consultants, reviewed and updated our peer group to assist with benchmarking of 2018-2019 compensation to ensure our programs remain market competitive.

- ***Adopted key compensation practices.*** In 2019, Ribbon adopted amended and restated share ownership guidelines and an amended and restated insider trading policy, which the Board believed were consistent with good governance practices. Our amended and restated share ownership guidelines apply to our CEO, our other Section 16 reporting officers, and our non-employee directors. These guidelines generally require the holding of shares with a fair market value equal to six times the annual base salary for our CEO within six years of becoming our CEO, two times the annual base salary of our Section 16 reporting officers within five years of becoming a Section 16 reporting officer, and five times the annual cash retainer of our non-employee directors within five years of becoming a non-employee director. Our amended and restated insider trading policy contains stringent restrictions on transactions in Company common stock by directors and officers and was amended and restated in 2019 to prohibit all executive officers and directors from engaging in transactions involving hedging, monetization, margin accounts, pledges, puts, calls and other derivative securities.

- ***Increased Equity Ownership Through the Stock-for-Cash Elections.*** In connection with the Company's annual cash bonus incentive program under the Senior Management Cash Incentive Plan, each of our executive officers and certain other employees were given the choice to receive a portion, ranging from 10% to 50% of their fiscal year 2018 target bonuses, if any were earned, in the form of shares of the Company's common stock in order to increase their equity ownership in the Company.

Consideration of Stockholder Say-on-Pay Vote

The Compensation Committee has historically considered the outcome of the Company's annual say-on-pay vote when making decisions regarding the Company's executive compensation program, including engaging in shareholder outreach, and in 2018, we took into account the outcome of the advisory vote when determining the terms and conditions of 2018 compensation. In both 2018 and 2019, we engaged with our compensation consultants to review and update our executive compensation program in a manner that we believe reflects the goals of our current business, and certain of the material aspects of the updated compensation program are described in this *Compensation Discussion and Analysis* section. While we believe our updated program provides the appropriate incentives and pay-for-performance culture for our NEOs, the Compensation Committee intends to continue to review our compensation practices in the future based on the results of say-on-pay votes and to engage stockholders for input into the Company's pay practices, where appropriate.

Overview of the Company's Compensation Program

The Company's executive compensation programs are administered by the Compensation Committee. In addition to attracting and retaining high caliber executives, the components of the executive compensation program are designed to reward both annual and long-term business performance. Additionally, other factors are critical, such as the successful execution of corporate strategies and fostering and driving continuous improvement and a high-performance culture.

Who Oversees the Company's Compensation Program?

The Compensation Committee. The Compensation Committee, which is comprised entirely of independent directors as defined by the independence standards of the Nasdaq Stock Market Rules, is primarily responsible for overseeing the Company's executive compensation program, after considering advice from an independent compensation consultant regarding competitive market pay practices. Our Board sets the overall corporate performance objectives for each year, while the Compensation Committee determines and approves the compensation level for the CEO; reviews and sets compensation levels of other key executive officers; evaluates the performance of these executives; and evaluates and approves all grants of equity-based compensation to the CEO and the other executive officers. All decisions regarding the CEO's compensation are made by the Compensation Committee in executive session without the CEO present. After the end of the fiscal year, the Compensation Committee reviews the actual corporate performance to determine the appropriate bonus amount, if any, to be paid to each eligible executive officer.

Role of the Compensation Consultant. The duties of the compensation consultant we engage are generally to evaluate executive compensation, perform an analysis on realized pay alignment with financial and stock performance, discuss general compensation trends, provide competitive market practice data and benchmarking, participate in the design and implementation of certain elements of the executive compensation program, and assist our CEO in developing compensation recommendations to present to the Compensation Committee for the other executive officers. The compensation consultant provides the Compensation Committee with advice, consultation and market information on a regular basis, as requested, throughout the year. The Compensation Committee may accept, reject or modify any recommendations by compensation consultants or other outside advisors.

Since December 2017, Frederic W. Cook & Co., Inc. ("**FW Cook**") has served as the compensation consultant of the Compensation Committee and has advised the Compensation Committee regarding its compensation decisions. The Compensation Committee assessed FW Cook's independence relative to standards prescribed by the SEC and determined that no conflicts existed.

Roles of the Chief Executive Officer and the Senior Vice President of Human Resources. The CEO, in consultation with the Compensation Committee's compensation consultant, develops compensation recommendations for the Compensation Committee to consider for other executives, but excluding the CEO. The CEO considers various factors when making individual compensation recommendations, including the relative importance of the executive's position within the organization, the individual tenure and experience of the executive, and the executive's individual performance and contributions to the Company's results.

The Senior Vice President of Human Resources works with the CEO to monitor existing compensation plans and programs applicable to the NEOs and other executives, to recommend financial and other targets to be achieved under those plans and programs, to prepare analyses of financial data, peer comparisons and other briefing materials for the Compensation Committee to aid in making its decisions and, ultimately, to implement the decisions of the Compensation Committee.

The Compensation Committee considers, but is not bound by, recommendations made by Company management regarding the compensation of all executives, but excluding the CEO. The Compensation Committee determines the CEO's compensation in its sole discretion.

Compensation Philosophy and Practices

Our compensation philosophy and practices are an important part of our business strategy. We have a rigorous performance and compensation management system and we believe our compensation processes and programs are aligned to provide strong incentive for success while appropriately balancing risk. Our overall executive compensation program is generally founded on three guiding principles:

- We offer competitive compensation packages **to attract** executives from large telecommunications or similar companies that may offer significantly greater cash compensation, and from smaller private telecommunications companies that may offer greater perceived equity growth potential;

- We offer cash- and equity-based incentive compensation **to motivate** our executives to continue to transform Ribbon into a seamlessly combined, profitable company in growing markets for secure real-time communications software, appliance and cloud-native solutions for service providers and enterprises; and

- We seek **to retain** our key executives in the face of other opportunities.

We seek to accomplish these objectives by providing independent Compensation Committee oversight; avoiding overly rigid, formulaic or short-term oriented goals; encouraging and rewarding outstanding initiative, achievement, teamwork and a shared success environment; and reinforcing critical measures of performance derived from our business strategy and key success factors. These objectives, and our general compensation philosophy, are reviewed on an annual basis and updated as appropriate.

Competitive Benchmarking

As part of the ongoing assessment of our executive compensation program, the Compensation Committee, with the assistance of its compensation consultant, reviews market compensation data, including the compensation practices of selected similar companies. Accordingly, the Compensation Committee updates the peer group from time to time in order to ensure that the Company's executive compensation program remains competitive and in line with market compensation data. The peer group generally consists of publicly-traded industrial companies that are in the information technology and related sub-industries with market capitalization and revenue in a similar range to that of the Company. The compensation consultant reviews the business descriptions of potential peer companies to identify businesses generally in the telecommunications and/or networking industries. Then, the Compensation Committee considers factors, such as executive talent and business-line competitors, global scope and complexity, research and development expenses, and market capitalization-to-revenue multiples, when selecting peers.

For executive compensation relating to 2018, at the recommendation of Pearl Meyer & Partners LLC ("**Pearl Meyer**"), who served as the compensation consultant of the Compensation Committee from June 2015 until December 2017, the Compensation Committee ratified a revised peer group in August 2017 in anticipation of the Merger. As discussed in the Company's 2018 Proxy Statement, which was filed with the SEC on April 30, 2018, the peer group ratified by the

Compensation Committee in August 2017 was updated to remove 8x8, Inc., Aerohive Networks, Inc., Ixia and RadiSys Corporation, respectively. Further, the Compensation Committee identified eight replacement companies as new peers: Applied Optoelectronics, Inc., CSG Systems International, Inc., Finisar Corporation, Harmonic Inc., Mitel Networks Corporation, NETGEAR, Inc., Oclaro, Inc. and Viavi Solutions Inc. In identifying new peer companies, the Compensation Committee reviewed companies based on the following characteristics: (1) geographic base—United States; (2) industry focus—technology hardware and equipment makers, with preference for communications equipment (or were other technology-based companies that serve the communications industry); (3) annual revenue—within a reasonable range of Ribbon's pro forma revenue; (4) market capitalization—within a reasonable range of the estimated post-Merger market cap; and (5) self-identification as a competitor—served similar customers and/or markets or had comparable margin profits. Compared to the peer group we previously used for executive compensation purposes earlier in 2017 and given the consummation of the Merger, the sixteen peer group companies represent larger companies as measured by revenue and market capitalization. The revised peer group consisted of the companies below. Pearl Meyer compiled compensation information from the peer group based on the publicly-filed documents of each member of the peer group.*

	Data at Time of Peer Group Roster Selection	
Company	Last Twelve Months Revenue ($ Millions)	Market Capitalization ($ Millions)
ADTRAN, Inc.	$702	$998
Applied Optoelectronics, Inc.	$449	$1,174
BroadSoft, Inc.	$385	$1,322
Calix, Inc.	$519	$342
Comtech Telecommunications Corp.	$553	$447
CSG Systems International, Inc.	$781	$1,371
Extreme Networks, Inc.	$593	$1,016
F5 Networks, Inc.	$2,112	$8,221
Finisar Corporation	$1,524	$2,897
Harmonic Inc.	$409	$423
Infinera Corporation	$772	$1,564
Mitel Networks Corporation	$958	$902
NETGEAR, Inc.	$1,388	$1,399
Oclaro, Inc.	$600	$1,562
ShoreTel, Inc.	$353	$396
Viavi Solutions Inc.	$810	$2,390
Ribbon Communications Inc.	$675	$788

* All data was compiled by Pearl Meyer, who obtained peer company financial market intelligence from S&P Capital IQ. The data generally represents revenue for the most recent four quarters available to Pearl Meyer at the time it compiled the data in July 2017, and market capitalization as of June 2017.

The Compensation Committee has further updated the Company's peer group for purposes of its 2019 compensation decisions so that the Company's executive compensation program remains competitive and aligned with market compensation data.

Compensation Components

The Compensation Committee annually reviews fixed and variable compensation received by our NEOs, including base salary, annual and long-term incentives, equity awards, and total equity in the Company. Our executive compensation program has four major components that support the Company's compensation objectives, each of which is discussed in detail below. Such major components reflect the compensation provided to our NEOs in 2018. The Compensation Committee reviews the executive compensation program on an annual basis and, in connection with its review of the Company's 2018 performance period, the compensation of all of our current executive officers has been streamlined into a structure similar to the below.

Compensation Mix. A significant portion of our executive officers' total direct compensation (which includes base salary, cash bonus and equity-based incentives) opportunity is attributable to variable compensation—that is, the amount our executives earn is dependent upon Company performance. The 2018 equity-based component of Mr. Hobbs consisted primarily of restricted stock and PSUs, each of which vest over time (and, in the case of the PSUs, company performance), if at all, and the value of which is tied to the value of the Company's common stock. For the remaining NEOs, the equity-based component of their 2018 compensation package consisted primarily of restricted stock, which vests over time, if at all, and the value of which is tied to the value of the Company's common stock. These variable elements were intended to align the executives' performance and interests with Company performance and long-term stockholder value.

The table below generally summarizes the elements of our compensation program for our NEOs in 2018:

Element	Form of Compensation	Purpose	Link to Company Performance
Base Salaries	Cash	Provide competitive, fixed compensation to attract and retain exceptional executive talent	Low
Annual Cash Incentives	Cash	Provide a direct incentive to achieve strong annual operating results	High
Long-Term Equity Incentives	Restricted shares of common stock and PSUs	Encourage executive officers to build and maintain a long-term equity ownership position in Ribbon so that their interests are aligned with those of our stockholders	High
Health, Retirement and Other Benefits	Eligibility to participate in benefit plans generally available to our employees, including 401(k) plan, premiums paid on long-term disability and life insurance	Benefit plans are part of a broad-based employee benefits program Our executives do not generally receive any material nonqualified deferred compensation plans or perquisites, with the exception of the following 2018 payments: $19,786 paid to Mr. Raiford in connection with his housing allowance, $4,237 paid to Mr. Raiford to provide him with financial planning services, and $25,000 paid to Mr. Scarfo as part of his annual cost-of-living adjustment allowance.	Low

How Target Levels of Compensation are Determined. In determining the amount of compensation to pay our NEOs, the Compensation Committee considers factors such as the executive officer's role within the Company and the level of responsibility, skills and experiences required by the position, the executive officer's qualifications, our ability to replace such individual and the overall competitive environment for executive talent. The Compensation Committee also takes into account the Company's performance, the executive's performance, the Compensation Committee's view of internal equity and consistency and other considerations it deems relevant. In analyzing these factors, the Compensation Committee reviews competitive compensation data gathered in comparative surveys (benchmarking and peer group data). The Compensation Committee does not have a policy for allocating target compensation among the various elements in any particular ratio, but generally attempts to provide an allocation similar to that used by other companies with whom the Company competes for executive talent using the peer data provided by our outside compensation consultant. Of the elements of total direct compensation, only base salary is fixed compensation, while cash bonuses and equity-based awards are both performance-contingent and variable compensation.

2018 Compensation Payouts

The established targets for individual components and overall executive compensation are designed to be competitive in order to attract, motivate and retain the executives necessary to drive and achieve the Company's objectives. In some cases, individual components may be over or under market (in order to emphasize a particular element or if individual circumstances dictate), but we believe that the total compensation package is market competitive for executives with the necessary backgrounds and skill sets. The Compensation Committee believes that the overall compensation program serves to balance the mix of cash and equity compensation with the mix of short- and long-term compensation for our NEOs.

Base Salary. Base salaries are designed to reflect the scope of responsibilities, performance and competencies of the individual executives, and the relation of that position to other positions in the Company and the external benchmark data for similar positions at peer companies. Each NEO's salary and performance are reviewed annually as well as at the time of a promotion or other change in responsibilities.

In 2018, with the exception of Mr. Bruny, who received a base salary increase from $300,000 to $350,000 in March 2018 because of his expanded role as Executive Vice President, Global Operation after the Merger, no changes were made to any NEO's base salary in connection with the annual compensation review or otherwise.

Annual Cash Bonuses. Annual cash incentives provide NEOs with the opportunity to earn additional cash compensation beyond base salary. The eligibility for an annual cash bonus creates an incentive to achieve desired near-term corporate goals that are in furtherance of the Company's long-term objectives. The compensation program establishes target bonuses for each NEO. Cash bonuses are expected to represent a substantial part of total compensation for our NEOs, if earned.

Setting of or Changes to Certain NEO's Eligibility for Annual Cash Bonuses. In connection with the Merger, the Compensation Committee, with the assistance of its compensation consultant, reviewed the compensation paid to its executive officers. Based on such review, in an effort to keep executive compensation competitive, to reflect certain executives' expanded roles after the Merger, and to improve certain executives' position against the market and the Company's peers, the Compensation

Committee set or adjusted, as applicable, the bonus target eligibility of certain executive officers as follows:

NEO	Previous Target Bonus	Revised Target Bonus	Effective Date	Effective Change
Franklin (Fritz) Hobbs	N/A	Fixed dollar amount of $500,000	April 2018	Not applicable as Mr. Hobbs was hired in December 2017
Steven Bruny	50% of his annual base salary (which was $350,000)	Fixed dollar amount of $350,000	March 2018	Target bonus increased by $175,000
Anthony Scarfo	N/A	Fixed dollar amount of $350,000	January 2018	Not applicable as Mr. Scarfo was hired in 2018
Michael Swade	75% of his annual base salary (which was $375,000)	Fixed dollar amount of $350,000	January 2018	Target bonus increased by $68,750

Senior Management Cash Incentive Plan. For 2018, the Company sponsored one cash incentive plan—the Senior Management Cash Incentive Plan (the "**SMCIP**")—that covered all of the NEOs over one full-year bonus period. The 2018 annual cash incentive plan for the CEO was calculated pursuant to a fixed formula based solely on the achievement of one financial metric—pre-bonus adjusted earnings before interest, taxes, depreciation and amortization ("**pre-bonus Adjusted EBITDA**"). The Compensation Committee added another metric—individual performance—to the SMCIP for NEOs (other than the CEO) such that 30% of their annual cash incentive bonus was attributable to individual performance and the remaining 70% was attributable to the Company's pre-bonus Adjusted EBITDA.

In February 2019, the Compensation Committee determined the 2018 cash bonus payout for each NEO. With the exception of Mr. Hobbs, such payout was calculated by multiplying the aggregate percentage achievement of two metrics—pre-bonus Adjusted EBITDA and the individual performance metric of each NEO—by the bonus at target for each such NEO. For Mr. Hobbs, the Compensation Committee determined his 2018 cash bonus payout by multiplying the percentage achievement of one metric—pre-bonus Adjusted EBITDA—by his bonus at target.

The performance targets under the SMCIP for each of the NEOs as well as the actual results of these financial measurements for 2018 were as follows:

	Target SMCIP Bonus Metrics				Actual 2018 Results
Pre-Bonus Adjusted EBITDA Metric*	<$80,000,000	$99,304,000	$103,639,000	>$103,639,000	$110,856,000
Company Performance Payout	0%	80%	100%	Amount above target (or 100%) based on Committee discretion within pre-established guidelines (not to exceed 125%)+	107%

* The Company calculated the pre-bonus Adjusted EBITDA component of the SMCIP as net income (loss) of the Company for the applicable performance period, excluding the following items: interest income (expense), net; income tax benefit (provision); depreciation and amortization; adjustments to revenue and cost of revenue related to revenue reductions resulting from purchase accounting and the impact of the revenue standard; stock-based compensation expense; acquisition-related facilities adjustments; settlement expense; certain litigation costs; cancelled debt offering costs; acquisition and integration related expense; restructuring expense; and other income, net. Unless otherwise determined by the Board or its delegate, "Adjusted EBITDA" was calculated consistently with the Company's existing public disclosure of adjusted EBITDA; provided, however, that notwithstanding anything to the contrary contained herein, "pre-bonus Adjusted EBITDA" was calculated by adjusting the publicly disclosed adjusted EBITDA for cash bonus expense.

\+ In February 2018, the Compensation Committee determined that to the extent the Company surpassed its target pre-bonus Adjusted EBITDA performance metric, then 50% of any dollar amount earned above such target amount would be available for the Compensation Committee to pay eligible employees as additional discretionary cash bonuses (the "**Overachievement Fund**"), and the remaining 50% would be returned for use by the Company; provided, however, that the Overachievement Fund would be capped at 125% of the total pre-bonus cash bonus expense amount that was used in the calculation of the pre-bonus Adjusted EBITDA.

The amounts paid under the SMCIP for 2018 were as follows:

		Actual Amounts Paid Under SMCIP		
NEO and Principal Position	Full Year Cash Bonus Eligibility	Company Performance Component	Individual Performance Component*,**	Total
Franklin (Fritz) Hobbs President and Chief Executive Officer	$500,000	$500,000	Not Applicable	$500,000
Daryl E. Raiford Executive Vice President and Chief Financial Officer	$375,000	$275,000	$0	$275,000
Steven Bruny Executive Vice President, Global Sales and Services	$350,000	$245,000	$105,000	$350,000
Anthony Scarfo Executive Vice President, Products, Research and Development, Support & Supply Chain	$350,000	$245,000	$105,000	$350,000
Michael Swade Former Executive Vice President, Global Sales	$350,000	$245,000	$105,000	$350,000

* With the exception of Mr. Hobbs who did not have an individual performance component to his 2018 cash bonus calculation, the individual performance metrics for each of the remaining NEOs were as follows:

Mr. Raiford's individual performance metrics were as follows: integrate financial reporting systems and processes; ensure accurate and timely close process and statutory financials; integrate forecasting cycle and improve accuracy; achieve revenue recognition readiness; and retain critical resources. Taking into account the above metrics as well as the results of the convertible debt offering, Mr. Raiford achieved zero percent of his individual performance metrics.

Mr. Bruny's individual performance metrics were as follows: successfully integrate the global operations after the Merger, deliver 2018 revenue above the forecasted amount, meet synergy and budget goals, provide cross-training for new products, successfully manage executive customer escalations and supported sales, and retain critical resources. Mr. Bruny achieved 100% of his individual performance metrics.

Mr. Swade's individual performance metrics were as follows: retain critical resources, successfully integrate sales organization post Merger, integrate sales operation systems and overachieve revenue target. Mr. Swade achieved 100% of his individual performance metrics.

Mr. Scarfo's individual performance metrics were as follows: successfully integrate the research and development teams after the Merger; achieve the products restructuring targets; reduce research and development costs; obtain Federal certification on certain products; focus on process improvement and retain critical resources. Mr. Scarfo achieved 100% of his individual performance metrics.

** With the exception of Mr. Hobbs, the individual performance component for each NEO was equal to 30% of such NEO's total cash bonus eligibility. As a result, the following amounts were eligible to be earned under the individual performance component at target: $112,500 for Mr. Raiford; and $105,000 for each of Messrs. Bruny, Swade and Scarfo.

With the exception of Mr. Hobbs and Mr. Raiford, the aggregate percentage achievement for each of the remaining NEOs would have resulted in a cash bonus payout of 105%, based on the performance targets that were established by the Compensation Committee. The aggregate percentage achievement for Mr. Hobbs would have resulted in a cash bonus payout of 107%, based on the performance target that was established by the Compensation Committee. Meanwhile, the aggregate percentage achievement for Mr. Raiford would have resulted in a cash bonus payout of 75%, based on the performance targets that were established by the Compensation Committee. However, the Compensation Committee retained discretion to reduce bonuses under the SMCIP and determined that each NEO would be paid out under the SMCIP at the following aggregate percentage achievement: 100% for each of Messrs. Hobbs, Bruny, Scarfo and Swade; and 73.33% for Mr. Raiford. In addition to such payout, the Compensation Committee determined that because the Company exceeded its financial metrics, the senior leadership team would be awarded additional discretionary cash bonuses pursuant to the SMCIP, as discussed later.

Stock-for-Cash Bonus Election Under the SMCIP. In connection with the Company's annual cash bonus incentive program under the SMCIP, each of Messrs. Hobbs, Raiford, Bruny, Scarfo, and Swade was given the choice to receive a portion, ranging from 10% to 50% (the "**Elected Percentage**") of their fiscal year 2018 target bonuses (the "**2018 Bonus**"), if any were earned, in the form of shares of the Company's common stock (the "**2018 Bonus Shares**" and such program, the "**Stock Bonus Election Program**"). Each such NEO could also elect not to participate in this program and to earn the 2018 Bonus, if any, in the form of cash. Under the Stock Bonus Election Program, the number of shares earned by each of the NEOs was calculated by dividing the applicable bonus amount (for each NEO, calculated as his Elected Percentage times his 2018 Bonus) by $4.97, the closing price of our common stock on March 8, 2019, the date of the company-wide cash bonus payments. The Company granted the 2018 Bonus Shares on March 15, 2019, in accordance with our practice of granting shares on the 15th of each month, or the next immediate business day if the 15th falls on a weekend or holiday. The 2018 Bonus Shares were fully vested on the grant date; however, each such NEO is contractually restricted from trading the 2018 Bonus Shares for five months after the date of grant. For more details regarding the Elected Percentage made by each NEO in the Stock Bonus Election Program, please see the footnotes in the chart below.

Overachievement Bonuses. The Compensation Committee awarded additional discretionary cash bonuses to the senior leadership team in recognition of the Company exceeding the target of $103,639,000 pre-bonus Adjusted EBITDA goal. More specific details relating to the additional discretionary cash bonus awarded to each NEO is included in the table below.

The following table summarizes the actions taken with respect to the aggregate 2018 cash bonuses for our NEOs:

Named Executive Officer and Principal Position	Full Year Cash Bonus Eligibility Under SMCIP	Actual Full Year Non-Discretionary Cash Bonus	Additional Discretionary Cash Bonus(1)	Full Year Bonus with Additional Discretionary Cash Bonus(2)
Franklin (Fritz) Hobbs President and Chief Executive Officer	$500,000	$500,000	$325,000	$825,000
Daryl E. Raiford Executive Vice President and Chief Financial Officer	$375,000	$275,000	$100,000	$375,000
Steven Bruny Executive Vice President, Global Sales and Services	$350,000(3)	$350,000	$200,000	$550,000
Michael Swade Former Executive Vice President, Global Sales	$350,000	$350,000	—	$350,000
Anthony Scarfo Executive Vice President, Products, Research and Development, Support & Supply Chain	$350,000	$350,000	$200,000	$550,000

(1) With the exception of Mr. Hobbs and Mr. Raiford, the aggregate percentage achievement for each of the NEOs would have resulted in a cash bonus payout of 105%, based on the performance targets that were established by the Compensation Committee. The aggregate percentage achievement of Mr. Hobbs' metric would have resulted in a cash bonus payout of 107%, based on the performance target that was established by the Compensation Committee. The aggregate percentage achievement of Mr. Raiford's metrics would have resulted in a cash bonus payout of 75% based on the performance targets that were established by the Compensation Committee.

The Compensation Committee determined, however, to pay out each NEO at the following percentage achievement under the SMCIP for their respective 2018 cash bonuses: 100% for each of Messrs. Hobbs, Bruny, Scarfo and Swade; and 73.33% for Mr. Raiford. In addition, the Compensation Committee determined that because the Company exceeded its financial metrics, the senior leadership team would be awarded additional discretionary cash bonuses.
Mr. Hobbs' aggregate percentage achievement of his Company metric resulted in a cash bonus payout of 165%. Meanwhile, each of Messrs. Raiford, Bruny, Scarfo and Swade's aggregate percentage achievement of their respective Company and personal metrics resulted in a total cash bonus payout of 100%, 157%, 157% and 100%, respectively.

(2) Pursuant to the Stock Bonus Election Program, Mr. Hobbs elected to receive 50% of his 2018 Bonus in the form of 2018 Bonus Shares; each of Messrs. Raiford and Bruny elected to receive 30% of his 2018 Bonus in the form of 2018 Bonus Shares; and each of Messrs. Scarfo and

Swade elected to receive 20% of his 2018 Bonus in the form of 2018 Bonus Shares. The number of shares earned by each of the NEOs was calculated by dividing the applicable bonus amount (for each NEO, calculated as his Elected Percentage times his 2018 Bonus) by $4.97, the closing price of our common stock on March 8, 2019, the date of the company-wide cash bonus payments. The 2018 Bonus Shares were granted on March 15, 2019.

Mr. Hobbs was granted 50,302 2018 Bonus Shares and was paid $250,000 in cash for his 2018 Bonus; Mr. Raiford was granted 16,600 2018 Bonus Shares and was paid $192,500 in cash for his 2018 Bonus; Mr. Bruny was granted 21,127 2018 Bonus Shares and was paid $245,000 in cash for his 2018 Bonus; Mr. Swade was granted 14,085 2018 Bonus Shares and was paid $280,000 in cash for his 2018 Bonus; and Mr. Scarfo was granted 14,085 2018 Bonus Shares and was paid $280,000 in cash for his 2018 Bonus.

(3) Mr. Bruny's base salary and bonus eligibility under the SMCIP were revised on March 1, 2018 because of his expanded role as Executive Vice President, Global Operation after the Merger. Mr. Bruny's base salary was increased from $300,000 to $350,000 per year and his bonus eligibility changed from a target bonus of 50% of his then-current base salary to a fixed amount of $350,000.

Equity-Based Incentives. Equity-based incentives are provided to executives whose decisions and actions have a direct impact upon our performance and success. Restricted stock and PSUs were granted to our executive officers in 2018 in order to tie their compensation directly to our long-term success. The Compensation Committee believes that a significant portion of each NEO's target total direct compensation should be made in the form of equity compensation due to its strong long-term alignment with stockholder interests. In determining the size of the restricted stock and PSU awards granted to each executive officer in 2018, the Compensation Committee took into account the executive officer's role, past performance, anticipated contribution to our long-term goals and market data for executive officers in similar roles at peer companies. Equity granted in prior years and existing levels of stock ownership were also taken into consideration. While the Compensation Committee considers the compensation of our peer group companies' senior executives, it does not benchmark a particular percentile for the total compensation of our NEOs or for any component thereof. The size of the awards is not determined by application of any formula, but rather reflects the Compensation Committee's subjective desire to encourage and reward high levels of performance.

2018 Equity Awards. In 2018, we made annual equity grants to our NEOs as shown below. A description of such equity awards that were granted in 2018 to our NEOs under the Ribbon Communications Inc. Amended and Restated Stock Incentive Plan follows:

Named Executive Officer	Restricted stock units (#)	Restricted shares (#)	Performance-based stock units (#)
Franklin (Fritz) Hobbs	345,000	—	195,000
Daryl E Raiford	20,000	—	—
Anthony Scarfo	15,000	75,000	—
Steven Bruny	40,000	—	—
Michael Swade	50,000	—	—

Treatment of PSUs Awards Based on 2018 Performance.

2018 PSUs. In May 2018, the Company granted its President and Chief Executive Officer, Mr. Hobbs, 195,000 PSUs with both performance and service conditions (the "**2018 PSUs**"). Of the 195,000 2018 PSUs, one-half each would vest based on the achievement of two separate metrics related to the Company's 2018 financial performance: pre-bonus Adjusted EBITDA and in-year synergies

(together, the "**2018 Performance Conditions**"). The Company's achievement of the 2018 Performance Conditions (and the shares of Company common stock to vest as a result thereof) were measured on a linear sliding scale in relation to specific threshold, target and maximum performance conditions. The number of shares of common stock to be received upon vesting of the 2018 PSUs would in no event exceed 150% of the 2018 PSUs. In February 2019, the Compensation Committee determined that the performance metrics for one-half of the 2018 PSUs had been achieved at the 106.49% achievement level and one-half of the 2018 PSUs had been achieved at the 150% level. However, in April 2019, the Compensation Committee subsequently determined that the performance metrics for the entire 2018 PSUs had been achieved at the 150% level, for a total of 292,500 shares earned, pending Mr. Hobbs' continued employment with the Company through December 31, 2020, the vesting date of the 2018 PSUs (collectively, the "**2018 Shares Earned**"). The details relating to the 2018 Performance Conditions as well as the actual results of these financial measurements for 2018 (as determined in April 2019) were as follows:

TARGET 2018 PSU Metrics for Mr. Hobbs			
Payout	Aggregate Number of Shares Eligible to be Received Under PSUs When Vested*	Pre-Bonus Adjusted EBITDA	In-Year Synergies
150%	292,500	$110,000,000	$95,000,000
100%	195,000	$107,264,000	$90,000,000
50%	97,500	$102,264,000	$85,000,000

ACTUAL Results for 2018 (in millions, except percentages and shares underlying PSUs)		
Bonus Payout	Pre-Bonus Adjusted EBITDA	In-Year Synergies
Actual Achievement	$110,856,000	$95,000,000
% Weighting	50%	50%
Individual Metric % Achievement	150%	150%
Number of Shares to be Received Under PSUs When Vested on December 31, 2020	146,250	146,250
Aggregate Number of Shares to be Received Under PSUs When Vested on December 31, 2020	292,500	

* Half of the shares eligible to be received under the PSUs were allocated to the pre-bonus Adjusted EBITDA performance metric and the other half of the shares eligible to be received under the PSUs were allocated to the in-year synergies metric.

From 2015 through 2017, the Company granted PSUs with both market and service conditions to Mr. Swade. The terms of each PSU grant were such that up to one-third of the shares subject to the respective PSU grant would vest, if at all, on each of the respective first, second and third anniversaries of the date of grant, depending on the relative comparison of the Company's total shareholder return ("**TSR**") to the TSR of the companies included in the Nasdaq Telecommunications Index for the same fiscal year, measured by the Compensation Committee after each of the fiscal years as defined by each grant (each, a "**Performance Period**"). The Nasdaq Telecommunications Index is used as a metric for our industry performance. The shares determined to be earned would vest on the anniversary of the grant date following each Performance Period and shares subject to the PSUs that fail to be earned would be forfeited.

For the companies included in the Nasdaq Telecommunications Index in 2018, a TSR of approximately (37.91)% would place a company at the 25th percentile, a TSR of approximately

(10.68)% would place a company at the 51st percentile and a TSR of approximately 15.45% would place a company at the 75th percentile. As a result, in February 2019, the Compensation Committee determined that the Company's TSR in 2018 placed us at the 31st percentile and, accordingly, the performance metrics for the PSUs granted on March 31, 2017 were achieved for the 2018 performance period at the 61.40% achievement level. Therefore, 3,198 shares underlying the PSUs were issued in respect of the 2018 performance period to Mr. Swade on March 31, 2019. The following chart provides a summary of the PSUs eligible for vesting as they relate to the 2018 performance period:

Named Executive Officer	*PSU Grant Date*	*Performance Metrics Achievement Level for 2018 Performance Period*	*Aggregate Number of PSUs Eligible for Vesting**	*Aggregate Number of PSUs Vested**	*Aggregate Number of PSUs Forfeited**
Michael Swade	March 31, 2017	61.40%	5,208	3,198	2,010
	Total	—	5,208	3,198	2,010

* The eligible vesting date for the PSUs granted on March 31, 2017 relating to the 2018 performance period was March 31, 2019.

Stock Ownership Requirements

The Board believes that it is important to link the interests of our NEOs, among others, to those of our stockholders. Our stock ownership policy requires our CEO, other Section 16 reporting officers, and non-employee directors to accumulate and hold a minimum number of shares of Company common stock within a certain number of years of joining the Board or the Company, respectively. The directors, Chief Executive Officer and other Section 16 reporting officers as of the date of the Merger must satisfy these ownership guidelines on or before October 27, 2022. Any other individual who is subject to our amended and restated stock ownership guidelines must satisfy these ownership guidelines within five years from the date they appointed as our director or other Section 16 reporting officer, as applicable; provided, however, that the Chief Executive Officer must satisfy the ownership guidelines within six years from the date he or she is appointed as the Chief Executive Officer. As of the record date, each of our directors, Chief Executive Officer and the other Section 16 reporting officers of the Company has either satisfied these ownership guidelines or had time remaining to do so. The specific stock ownership requirements for our directors, Chief Executive Officer and other Section 16 reporting officers as a multiple of annual base salary are as follows:

Title	Multiple of Annual Base Salary/ Annual Retainer
Chief Executive Officer	6 times annual base salary
Section 16 Reporting Officers	2 times annual base salary
Non-Employee Directors	5 times annual cash retainer

Each individual who is subject to this policy must maintain the applicable minimum amount of stock ownership throughout his or her employment or tenure as a director of the Company. The value of each such individual's stock ownership will be measured annually by the Compensation Committee.

Benefits and Other Compensation

We have various broad-based employee benefit plans. We do not typically offer perquisites or employee benefits to executive officers that are not also made available to employees on a broad basis. However, pursuant to the terms of their respective employment agreements with the Company, in 2018, we provided Mr. Raiford with a monthly housing allowance aggregating $19,786 and $4,237 to use for financial planning services, and we provided Mr. Scarfo with a $25,000 annual cost-of-living adjustment allowance. Our executive officers generally are eligible for the same benefits that are available to all employees, which include group health, dental and vision insurance, life and disability insurance, discretionary 401(k) matching contributions and paid holidays. We offer a 401(k) plan, which allows our employees to invest in a wide array of funds. We also reinstated our Amended and Restated 2000 Employee Stock Purchase Plan, effective December 1, 2018, for employees in certain countries. Except for certain post-termination benefits in connection with severance, we do not provide pension arrangements or post-retirement health coverage for our NEOs. We have entered into indemnification agreements with our executive officers and directors.

Severance and Separation Arrangements

We have entered into agreements with each of our NEOs, which generally provide that, upon a termination of the NEO's employment by the Company without Cause (as defined in the applicable NEO's employment agreement), due to a resignation by the NEO for Good Reason (as defined in the applicable NEO's employment agreement) or due to death or disability of the NEO (other than Messrs. Raiford, Bruny and Scarfo), the NEO is entitled to certain severance payments and benefits. We believe the entry into such severance arrangements by Ribbon (or our predecessors) is generally consistent with market practice and allows our executives to remain focused on the Company's objectives in times of potential uncertainty.

Clawback Policy

All awards granted under our equity plans are subject to clawback pursuant to the Company's Clawback Policy and any other clawback policy that the Company may adopt in the future.

For further discussion regarding the severance and separation agreements and arrangements, see "*Severance and Change in Control Benefits*" below.

Transactions Involving Hedging, Monetization, Margin Accounts, Pledges, Puts, Calls and Other Derivative Securities

The Company's amended and restated insider trading policy contains stringent restrictions on transactions in Company common stock by directors and officers. All trades by directors and officers must be pre-approved by the Chief Financial Officer or the General Counsel. Our current insider trading policy was amended and restated in 2019 to prohibit all executive officers and directors from engaging in transactions involving hedging, monetization, margin accounts, pledges, puts, calls and other derivative securities.

Tax and Accounting Considerations

Accounting for Stock-Based Compensation. We account for stock-based compensation in accordance with ASC 718.

Policy on Deductibility of Executive Compensation. Section 162(m) of the Code generally disallows a tax deduction for annual compensation in excess of $1.0 million paid to certain executive officers of the Company. The Tax Cuts and Jobs Act, signed into law on December 22, 2017 ("**Tax Reform**"), repealed the "performance-based compensation" exception to such deduction limitation and expanded the scope of the executive officers who are covered by Section 162(m) of the Code. As a result, for tax years beginning after December 31, 2017, compensation previously intended to be "performance-based" and not subject to Section 162(m) may not be deductible unless it qualifies for limited transition relief applicable to certain remuneration payable pursuant to a written binding contract which was in effect on November 2, 2017. The Compensation Committee reviews the potential effect of Section 162(m) of the Code periodically and has reviewed the potential effects of Tax Reform on the Company's compensation practices. However, the Compensation Committee has no obligation to limit compensation to that which is deductible under Section 162(m) of the Code and may use its judgment to authorize compensation programs and payments (or the modification of existing compensation programs or payments) that may not be deductible when it believes such programs and payments are appropriate and in the Company's and our stockholders' best interests. Further, due to uncertainties in the applications of Section 162(m) of the Code and Tax Reform, there is no guarantee that deductions claimed under Section 162(m) of the Code will not be challenged or disallowed by the Internal Revenue Service and our ability to deduct compensation under Section 162(m) of the Code may be restricted.

Risk Management and Our Executive Compensation Program

The Compensation Committee monitors and manages our executive compensation program to help ensure that it does not encourage excessive risk taking. The Compensation Committee reviewed, analyzed and considered whether the Company's compensation policies and practices create risks that are reasonably likely to have a material adverse effect on us, and concluded that no such material risks exist.

EXECUTIVE COMPENSATION TABLES

The following table sets forth, for the year ended December 31, 2018 and for the two years prior thereto, the compensation earned by our Chief Executive Officer, our Chief Financial Officer, the other three most highly compensated executive officers serving as executive officers at December 31, 2018.

Summary Compensation Table

2018 SUMMARY COMPENSATION TABLE

Name and Principal Position	Year	Salary ($)	Bonus ($)(1)	Stock Awards ($)(2)	Option Awards ($)	Non-Equity Incentive Plan Compensation ($)(3)	All Other Compensation ($)(4)	Total ($)
Franklin Hobbs(5)	2018	$500,000	$325,000	$2,967,000	$—	$500,000	$1,909	$4,293,909
President and Chief Executive Officer	2017	$30,094	$—	$—	$—	$—	$—	$30,094
Daryl Raiford(6)	2018	$500,000	$100,000	$132,000	$—	$275,000	$42,374	$1,049,374
Executive Vice President and Chief Financial Officer	2017	$123,077	$—	$672,028	$—	$—	$6,891	$801,996
Anthony Scarfo(7) *Executive Vice President, Products, R&D, Support and Supply Chain*	2018	$331,154	$225,000	$627,000	$—	$350,000	$44,164	$1,577,318
Steven Bruny(8) *Executive Vice President, Global Sales & Services*	2018	$341,667	$425,000	$264,000	$—	$350,000	$23,028	$1,403,695
Michael Swade(9)	2018	$375,000	$—	$330,000	$—	$350,000	$24,744	$1,079,744
Former Executive Vice	2017	$375,000	$200,000	$880,625	$—	$320,650	$20,283	$1,796,558
President, Global Sales	2016	$375,000	$—	$615,250	$—	$262,500	$18,549	$1,271,299

(1) The 2018 amount for Mr. Hobbs represents an additional discretionary cash bonus due to the Company's overachievement of its 2018 corporate goals (the "**2018 Discretionary Bonus**"). The 2018 amount for Mr. Raiford represents his 2018 Discretionary Bonus. The 2018 amount for Mr. Scarfo is comprised of $200,000 for his 2018 Discretionary Bonus and a sign-on bonus of $25,000 in connection with his employment by the Company, effective January 22, 2018. The 2018 amount for Mr. Bruny is comprised of $225,000 for the second installment of a retention bonus paid to Mr. Bruny in connection with the Merger and $200,000 for his 2018 Discretionary Bonus. The 2017 amount for Mr. Swade represents three cash bonus payments (one payment of $100,000 and two payments of $50,000 each) in connection with the Merger.

(2) The amounts shown in this column do not reflect compensation actually received by the NEO. Instead, the amounts primarily reflect the grant date fair value of each stock award granted to each NEO. The grant date fair values of stock awards were calculated in accordance with ASC 718. The methodology for calculating the grant date fair value of stock awards is discussed in Note 16 to our Annual Report on Form 10 K/A, Amendment No. 1, for the year ended December 31, 2018. The grant date fair value of restricted stock awards and units is equal to the closing price of our common stock on the date of grant. In 2018, we granted PSUs with both performance and service conditions to Mr. Hobbs. The grant date fair value of Mr. Hobbs' PSUs is equal to the closing price of our common stock on the date of grant. In 2016 and 2017, we granted PSUs with both market and service conditions to Mr. Swade. The inclusion of a market condition requires the use of a Monte Carlo simulation approach to model future stock price movements based upon the risk-free rate of return, the volatility of each entity included in the market index and the pair-wise covariance between each entity. These results are then used to calculate the grant date fair values of such PSUs.

(3) The amounts shown in this column represent the of amounts earned under our SMCIP. For 2018, each of Messrs. Hobbs, Raiford, Scarfo, Bruny and Swade was given the choice to receive a portion, ranging from 10% to 50% of their 2018 Bonus, if any were earned, in 2018 Bonus Shares under the Stock Bonus Election Program. Each such NEO could also elect not to participate in this program and to earn his 2018 Bonus, if any, in the form of cash. Under the Stock Bonus Election Program, the number of shares earned by each of the NEOs was calculated by dividing the applicable bonus amount (for each NEO, calculated as his Elected Percentage times his 2018 Bonus) by $4.97, the closing price of our common stock on March 8, 2019, the date of the company-wide cash bonus payments. The Company granted the 2018 Bonus Shares on March 15, 2019, in

accordance with our practice of granting shares on the 15th of each month, or the next immediate business day if the 15th falls on a weekend or holiday. The amount of each NEO's 2018 Bonus attributable to the 2018 Bonus Shares included in the amount above was as follows: Mr. Hobbs: $250,000; Mr. Raiford: $82,500; Mr. Scarfo: $70,000; Mr. Bruny: $105,000; and Mr. Swade: $70,000. The closing price of our common stock on March 15, 2019 was $5.22, and such closing price is the grant date fair value of each 2018 Bonus Share. Accordingly, the grant date fair value of each NEO's 2018 Bonus Shares was as follows: Mr. Hobbs: $262,577; Mr. Raiford: $86,652; Mr. Scarfo: $73,524; Mr. Bruny: $110,283; and Mr. Swade: $73,524. The 2018 Bonus Shares were fully vested on the grant date; however, each such NEO is contractually restricted from trading the 2018 Bonus Shares for five months after the date of grant.

For 2017, the Compensation Committee elected to implement two half-year bonus periods such that 20% of the full year target payout was attributable to the first half of 2017 and 80% of the full year target payout was attributable to the second half of 2017. The Compensation Committee determined the financial metrics upon which such bonus payments would be made on the same half-year basis. Accordingly, Mr. Swade received his 2017 bonus payments in August 2017 (20% of the target based on achievement of the financial metrics for the first half of 2017) and in March 2018 (80% of target based on achievement of the financial metrics for the second half of 2017). In July 2017, our Compensation Committee determined that the achievement level under the SMCIP for the first half of 2017 was at 126%, and in February 2018, determined that the achievement level under the SMCIP for the second half of 2017 was at 131%. The Compensation Committee determined, however, to reduce the NEO's bonuses in respect of the first half and second half of 2017 on a discretionary basis, with the first half payout equal to 110% of target and the second half payout equal to 115% of target. The overall financial performance, after taking into account the Compensation Committee's discretionary reductions, resulted in an aggregate cash bonus payout to Mr. Swade of 114%.

For 2016, the Compensation Committee elected to implement two half-year bonus periods such that 30% of the full year target payout was attributable to the first half of 2016 and 70% of the full year target payout was attributable to the second half of 2016. The Compensation Committee determined the financial metrics upon which such bonus payments would be made on the same half-year basis. Accordingly, Mr. Swade received his 2016 bonus payouts in August 2016 (30% of target based on achievement of the financial metrics for the first half of 2016) and in March 2017 (70% of target based on achievement of the financial metrics for the second half of 2016). Based on these fixed metrics, in July 2016, the Compensation Committee determined that the achievement level under the SMCIP was 164% of target. However, the Compensation Committee determined to decrease the payout of cash bonuses to 150% of target. In February 2017, the Compensation Committee determined that the achievement level under the SMCIP for the second half of 2016 was 69% of target. Based upon these achievement levels, the overall financial performance resulted in an aggregate cash bonus payout for 2016 of 93%.

(4) The Company portions of health, disability and life insurance premiums and 401(k) matching contributions included in this column are also provided to all members of the Company, with the amounts dependent upon the level of health insurance coverage selected by each individual. Accordingly, the Company portion of premiums paid and 401(k) matching contributions are not considered perquisites but are reported as income earned for each NEO, if applicable.

(5) Mr. Hobbs' "All Other Compensation" of $1,909 represents the Company's portion of his life, disability and excess liability insurance. Mr. Hobbs served as a non-employee member of the Board from October 27, 2017 through December 13, 2017, the date he was appointed as the Company's President and Chief Executive Officer. As a result, the only compensation earned by Mr. Hobbs with respect to 2017 was non-employee director fees through December 13, 2017, equal to $8,940, and base salary through December 31, 2017, equal to $21,154.

(6) Mr. Raiford's 2018 "All Other Compensation" of $42,374 is comprised of $19,786 for his housing allowance, $15,773 for the Company's portion of his medical insurance, $4,237 for financial planning service costs, $1,809 for the Company portion of his life, disability and excess liability insurance, and $769 for the Company's contribution to his 401(k) account. In addition, Mr. Raiford will receive a true-up of the Company match to his 2018 401(k) contributions in 2019 upon completion of Company compliance testing. The Company currently does not know the amount of such true-up; however, the total maximum amount of the Company's contribution to Mr. Raiford's 401(k) account for 2018, including the true-up, will not exceed $5,500. Mr. Raiford's 2017 "All Other Compensation" of $6,891 is comprised of $3,446 for the Company's portion of his health insurance and $3,445 for his housing allowance for the period from the date of the Merger (or October 27, 2017) through December 31, 2017.

(7) Mr. Scarfo's 2018 "All Other Compensation" of $44,164 is comprised of his $25,000 annual cost-of-living adjustment allowance, $11,909 for the Company's portion of his medical insurance, $5,500 for the Company's matching contribution to his 401(k) account and $1,755 for the Company's portion of his life, disability and excess liability insurance. Mr. Scarfo joined the Company as our Executive Vice President, Products and Research & Development on January 22, 2018. Effective January 13, 2019, he was named Executive Vice President, Products, R&D, Support and Supply Chain.

(8) Mr. Bruny's annual salary increased from $300,000 to $350,000, effective March 1, 2018, because of his expanded role as Executive Vice President, Global Operation after the Merger. Mr. Bruny's 2018 "All Other Compensation" of $23,028 is comprised of $15,773 for the Company's portion of his health insurance, $5,500 for the Company's matching contribution to his 401(k) account and $1,755 for the Company's portion of his life, disability and excess liability insurance. Throughout 2018, Mr. Bruny served as the Company's Executive Vice President, Global Services. Effective January 14, 2019, Mr. Bruny assumed Mr. Swade's responsibilities and was named Executive Vice President, Global Sales and Services.

(9) Mr. Swade's 2018 "All Other Compensation" of $24,744 is comprised of $18,140 for the Company's portion of his health insurance, $5,500 for the Company's matching contribution to his 401(k) account and $1,103 for the Company's portion of his life and disability insurance. Mr. Swade's 2017 "All Other Compensation" of $20,283 is comprised of $18,283 for the Company's portion of his health insurance and $2,000 for the Company's matching contribution to his 401(k) account. Mr. Swade's 2016 "All Other Compensation" of $18,549 is comprised of $17,549 for the Company's portion of his health insurance and $1,000 for the Company's matching contribution to his 401(k) account. Effective January 14, 2019, Mr. Swade stepped down from his position of Executive Vice President, Global Sales. Mr. Swade remained with the Company through March 31, 2019 to assist with the transition of his responsibilities to Mr. Bruny.

Grants of Plan-Based Awards in 2018

The following table sets forth information about incentive plan awards made to the NEOs during the year ended December 31, 2018:

2018 GRANTS OF PLAN-BASED AWARDS

			Estimated Future Payouts Under Non-Equity Incentive Plan Awards(2)			Estimated Future Payouts Under Equity Incentive Plan Awards(3)						
Name	Grant Date	Date of Compensation Committee Action(1)	Threshold ($)	Target ($)	Maximum ($)	Threshold (#)	Target (#)	Maximum (#)	Awards: Number of Shares of Stock or Units (#)	Awards: Number of Securities Underlying Options (#)	Exercise or Base Price of Option Awards ($/Sh)	Grant Date Fair Value of Stock and Option Awards ($)(4)
Franklin Hobbs	19-Apr-18	19-Apr-18							150,000			$ 802,500
	15-May-18	19-Apr-18							195,000			$1,082,250
	15-May-18	19-Apr-18				—	195,000	292,500				$1,082,250
		22-Feb-18	$—	$500,000								
Daryl Raiford	15-Jun-18	13-Jun-18							20,000			$ 132,000
		22-Feb-18	$—	$375,000								
Anthony Scarfo	15-Feb-18	19-Jan-18							75,000			$ 528,000
	15-Jun-18	13-Jun-18							15,000			$ 99,000
		22-Feb-18	$—	$350,000								
Steven Bruny	15-Jun-18	13-Jun-18							40,000			$ 264,000
		22-Feb-18	$—	$350,000								
Michael Swade	15-Jun-18	13-Jun-18							50,000			$ 330,000
		22-Feb-18	$—	$350,000								

(1) Represents the date on which the Compensation Committee took action to approve the equity-based award or the performance metrics for achievement of such award, as applicable.

(2) "Target" amount represent the potential bonus payment under the SMCIP at target level of achievement. Overachievement Fund payments, if any, upon achievement of performance above target under the SMCIP are discretionary and are not included herein.

For 2018, each of Messrs. Hobbs, Raiford, Scarfo, Bruny and Swade was given the choice to receive a portion, ranging from 10% to 50% of their 2018 Bonus, if any were earned, in 2018 Bonus Shares under the Stock Bonus Election Program. Each such NEO could also elect not to participate in this program and to earn his 2018 Bonus, if any, in the form of cash. Pursuant to the Stock Bonus Election Program, Mr. Hobbs elected to receive 50% of his 2018 Bonus in the form of 2018 Bonus Shares; each of Messrs. Raiford and Bruny elected to receive 30% of his 2018 Bonus in the form of 2018 Bonus Shares; and each of Messrs. Scarfo and Swade each elected to receive 20% of his 2018 Bonus in the form of 2018 Bonus Shares. The number of shares earned by each of the NEOs was calculated by dividing the applicable bonus amount (for each NEO, calculated as his Elected Percentage times his 2018 Bonus) by $4.97, the closing price of our common stock on March 8, 2019, the date of the company-wide cash bonus payments. The 2018 Bonus Shares were granted on March 15, 2019. Mr. Hobbs was granted 50,302 2018 Bonus Shares and was paid $250,000 in cash for his 2018 Bonus; Mr. Raiford was granted 16,600 2018 Bonus Shares and was paid $192,500 in cash for his 2018 Bonus; Mr. Scarfo was granted 14,085 2018 Bonus Shares and was paid $280,000 in cash for his 2018 Bonus; Mr. Bruny was granted 21,127 2018 Bonus Shares and was paid $245,000 in cash for his 2018 Bonus; and Mr. Swade was granted 14,085 2018 Bonus Shares and was paid $280,000 in cash for his 2018 Bonus. The Stock Bonus Election Program was implemented after the initial adoption of the SMCIP for 2018 and, as a result, we have included the amounts of potential payouts attributable to 2018 Bonus Shares in these columns.

(3) In May 2018, we granted Mr. Hobbs 195,000 PSUs with both performance and service conditions (the "**2018 PSUs**"). Of the 195,000 2018 PSUs, one-half each would vest based on the achievement of two separate metrics related to the Company's 2018 financial performance (the "**2018 Performance Conditions**"). The Company's achievement of the 2018 Performance Conditions (and the shares of Company common stock to vest as a result thereof) were measured on a linear sliding scale in relation to specific threshold, target and stretch performance conditions. The number of shares of common stock to be received upon vesting of the 2018 PSUs would in no event exceed 150% of the 2018 PSUs. In February 2019, the Compensation Committee determined that the performance metrics for one-half of the 2018 PSUs had been achieved at the 106.49% achievement level and one-half of the 2018 PSUs had been achieved at the 150% level. However, in April 2019, the Compensation Committee subsequently determined that the performance metrics for the entire 2018 PSUs had been achieved at the 150% level, for a total of 292,500 shares earned, pending Mr. Hobbs' continued employment with the Company through December 31, 2020, the vesting date of the 2018 PSUs.

(4) Amounts reflect the grant date fair values of the RSUs and PSUs estimated in accordance with ASC 718 as of the respective grant dates. The methodology for calculating the grant date fair value of stock awards is discussed in Note 16 to our 2018 Annual Report. The grant date fair value of restricted stock awards and units is equal to the closing price of our common stock on the date of grant.

Outstanding Equity Awards at Fiscal Year End

The following table sets forth information concerning stock options and unvested stock awards held by the NEOs as of December 31, 2018:

OUTSTANDING EQUITY AWARDS AT 2018 FISCAL YEAR-END

	Option Awards					Stock Awards			
Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock Awards That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)(1)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested ($)(1)
Franklin Hobbs						130,000(2) 292,500 (3)	$626,000 $1,409,850		
Daryl Raiford						64,555(4) 20,000(4)	$311,155 $96,400		
Anthony Scarfo						75,000(5) 15,000(5)	$361,500 $72,300		
Steven Bruny						50,555(6) 40,000(6)	$243,675 $192,800		
Michael Swade						50,000(7) 3,198(8)	$241,000 $15,414		

(1) In accordance with SEC rules, the market value of unvested shares of restricted stock was determined by multiplying the number of such shares by $4.82, the closing market price of our common stock on December 31, 2018.

(2) Of Mr. Hobbs' 130,000 unvested restricted shares, 65,000 will vest on December 31, 2019 and 65,000 will vest on December 31, 2020.

(3) Represents the number of shares underlying Mr. Hobbs' unvested PSUs based on actual 2018 performance. All 292,500 shares will vest on December 31, 2020.

(4) Of Mr. Raiford's 64,555 unvested restricted shares, 16,139 will vest on May 15, 2019, 16,139 will vest on November 15, 2019, 16,138 will vest on May 15, 2020 and 16,139 will vest on November 15, 2020. Of Mr. Raiford's 20,000 unvested restricted shares, 6,667 shares will vest on June 15, 2019, 3,333 shares will vest on December 15, 2019, 3,334 will vest on June 15, 2020, 3,333 will vest on December 15, 2020 and 3,333 will vest on June 15, 2021.

(5) Of Mr. Scarfo's 75,000 unvested restricted shares, 25,001 vested on February 15, 2019, 12,500 will vest on August 15, 2019, 12,500 will vest on February 15, 2020, 12,499 will vest on August 15, 2020 and 12,500 will vest on February 15, 2021. Of Mr. Scarfo's 15,000 unvested restricted shares, 5,001 will vest on June 15, 2019, 2,500 will vest on December 15, 2019, 2,500 will vest on June 15, 2020, 2,499 will vest on December 15, 2020 and 2,500 will vest on June 15, 2021.

(6) Of Mr. Bruny's 50,555 unvested restricted shares, 12,639 will vest on May 15, 2019, 12,639 will vest on November 15, 2019, 12,638 will vest on May 15, 2020 and 12,639 will vest on November 15, 2020. Of Mr. Bruny's 40,000 unvested restricted shares, 13,334 will vest on June 15, 2019, 6,667 will vest on December 15, 2019, 6,666 will vest on June 15, 2020, 6,667 will vest on December 15, 2020 and 6,666 will vest on June 15, 2021.

(7) Of Mr. Swade's 50,000 unvested restricted shares, all 50,000 vested in connection with his separation from the Company effective March 31, 2019.

(8) Represents the number of shares underlying Mr. Swade's earned PSUs based on actual 2018 performance. All 3,198 shares vested on March 31, 2019. Mr. Swade forfeited 2,010 unvested PSUs as a result of the Company's actual 2018 TSR performance percentage of 61.40%.

Option Exercises and Stock Vested

The following table summarizes for the NEOs in 2018 the number of shares acquired upon the exercise or vesting, as applicable, of stock options and stock awards and the value realized, before payout of any applicable withholding tax. None of our NEOs exercised stock options during 2018.

2018 OPTION EXERCISES AND STOCK VESTED

	Option Awards		Stock Awards	
Name	Number of Shares Acquired on Exercise (#)	Value Realized On Vesting ($)	Number of Shares Acquired on Vesting (#)(1)	Value Realized on Vesting ($)(2)
Franklin Hobbs	—	—	215,000	1,094,350
Daryl Raiford	—	—	32,279	197,547
Anthony Scarfo	—	—	—	—
Steven Bruny	—	—	25,279	154,707
Michael Swade	—	—	94,771	1,518,713

(1) Of Mr. Hobbs' 215,000 shares that vested in 2018, 105,285 shares were returned to us to satisfy the tax withholding obligation associated with the vesting of the shares.

Of Mr. Raiford's 32,279 shares that vested in 2018, 7,859 shares were returned to us to satisfy the tax withholding obligation associated with the vesting of the shares.

Of Mr. Bruny's 25,279 shares that vested in 2018, 7,325 shares were returned to us to satisfy the tax withholding obligation associated with the vesting of the shares.

Of Mr. Swade's 94,771 shares that vested in 2018, 28,469 shares were returned to us to satisfy the tax withholding obligation associated with the vesting of the shares.

(2) In accordance with SEC rules, the aggregate dollar amount realized upon vesting of shares of restricted stock was determined by multiplying the number of shares by the closing market price of our common stock on the day before vesting.

CEO Pay Ratio

As of November 1, 2018, the Company had a worldwide population of 2,301 employees (including full-time, part-time, seasonal and temporary employees). To determine the median annual compensation for all employees other than the CEO, a median employee was identified from the worldwide population of employees on November 1, 2018, excluding its 96 employees from the following jurisdictions: Mexico (75 employees) and Malaysia (21 employees), which in the aggregate represent 5% or less of the Company's total employee population. No employees were excluded from the employee population due to data privacy issues.

To determine the median employee, we utilized the "regular earnings" of the applicable employees for 2018, which represents cash compensation excluding bonus, commissions and other

similar incentive compensation. The Company did not utilize any cost of living or other material adjustments. In connection with our analysis, we utilized the foreign currency exchange rate used for our internal financial accounting purposes, as of November 1, 2018. Based on the foregoing, the median employee was determined to be a Systems Integration Technical Specialist working on a full-time basis in the United States.

For 2018, the annual total compensation for the median employee was $110,338 and the annual total compensation for our CEO was $4,293,909, which reflects the aggregate of the compensation paid to Mr. Hobbs for 2018. Based on the calculation of the annual total compensation for both the CEO and the median employee (as described above), the ratio of CEO pay to the median employee pay is approximately 39:1. The pay ratio provided is a reasonable estimate. Because the SEC rules for identifying the median employee and calculating the pay ratio allow companies to use different methodologies, exemptions, estimates and assumptions, our pay ratio may not be comparable to the pay ratio reported by other companies or our pay ratio in any future year.

Severance and Change of Control Benefits

To attract and retain key executive officers, the Company has entered into executive agreements that include severance and change of control benefits. In the event or threat of a change of control transaction, we believe that these agreements reduce uncertainty and provide compensation for the significant levels of executive engagement and support required during an ownership transition that may result in the termination of their employment. The severance arrangements generally provide that, upon termination of the NEO's employment by the Company without cause, by the NEO for good reason or due to death or disability of the NEO (except Messrs. Raiford, Bruny and Scarfo), the NEO is entitled to certain severance payments and benefits as described below.

Franklin Hobbs

On April 19, 2018, we entered into a severance agreement with Mr. Hobbs. Pursuant to such agreement, upon a termination of Mr. Hobbs' employment by the Company without Cause (as defined in such agreement), or upon a resignation by Mr. Hobbs for Good Reason (as defined in such agreement), Mr. Hobbs is entitled to severance payments equal to 100% of his base salary and target annual bonus, and continued health plan premium payments for up to 12 months. Upon termination by the Company without Cause or a resignation for Good Reason in connection with a change in control, in addition to the foregoing, and upon termination by the Company due to death or Disability (as defined in such agreement), Mr. Hobbs is also entitled to accelerated vesting of all outstanding equity awards (with performance-based awards vesting as if target performance had been achieved). Upon a change of control of the Company, Mr. Hobbs' PSUs would continue to vest through the initial vest date, with the number of such shares that would continue to vest calculated as the shares equal to achievement of the performance metrics, pro-rated for the number of days of Mr. Hobbs' service during the vesting period.

The severance payments (other than target annual bonus) for Mr. Hobbs will be made in accordance with the Company's normal payroll practices for a period of 12 months following a qualifying termination of employment.

Daryl Raiford

If the Company terminates Mr. Raiford's employment (other than for Cause (as defined in his amended and restated employment agreement, as amended) or as a result of his death or disability), or upon a resignation by Mr. Raiford for Good Reason (as defined in his amended and restated employment agreement, as amended), he will be entitled to the following compensation and benefits: 100% of his base salary, a pro-rata amount of his target annual bonus, 100% of his target annual bonus, and continued health plan premium payments for up to 12 months. If Mr. Raiford's termination occurs within 12 months of a Change in Control (as defined in his amended and restated employment agreement, as amended), he will be entitled to the following compensation and benefits: 200% of his base salary, a pro-rata amount of his target annual bonus, 200% of his target annual bonus, continued health plan premium payments for up to 12 months, an accelerated vesting of all of his outstanding equity. Upon a Change in Control of the Company, Mr. Raiford would receive an accelerated vesting of 50% of his outstanding equity. All compensation payments to which Mr. Raiford will be entitled will be made in 12-monthly installments, except for the pro-rata amount of his target annual bonus, which will be paid in a lump sum.

Upon a "material transaction" (as defined in his retention bonus agreement), Mr. Raiford will be entitled to a change in control bonus equal to $1,060,000, subject to his continued employment through such material transaction or his termination without Cause.

Steven Bruny

Upon a termination of Mr. Bruny's employment by the Company, other than for Cause (as defined in his severance agreement), or upon his resignation for Good Reason (as defined in his severance agreement) or as a result of his death or Disability (as defined in his severance agreement), and within six months following the occurrence of a Change in Control (as defined in his severance agreement), Mr. Bruny is entitled to severance payments equal to 50% of his base salary and continued health plan premium payments for up to 6 months.

Anthony Scarfo

On January 19, 2018, we entered into an employment agreement with Mr. Scarfo. Pursuant to such agreement, upon a termination of Mr. Scarfo's employment by the Company without Cause (as defined in such agreement), or upon a resignation by Mr. Scarfo for Good Reason (as defined in such agreement), Mr. Scarfo is currently entitled to severance payments equal to 12 months of his base salary and continued health plan premium payments for up to 12 months. Additionally, the Company may elect to pay Mr. Scarfo a pro-rated portion of his then applicable target bonus, less applicable state and federal withholdings, calculated upon reference to his termination date.

The severance payments (other than target annual bonus) for Mr. Scarfo will be made in accordance with the Company's normal payroll practices for a period of 12 months following a qualifying termination of employment.

Michael Swade

Effective January 14, 2019 (the "**Transition Date**"), Mr. Swade stepped down from his position as the Company's Executive Vice President, Global Sales. Mr. Swade entered into a letter agreement, dated January 13, 2018 (the "**Swade Agreement**"), concerning his separation from the Company and its affiliates.

Pursuant to the Swade Agreement, Mr. Swade remained employed by Ribbon Communications Operating Company, Inc., a wholly-owned subsidiary of the Company ("**RCOC**"), to provide transition assistance to the Company's sales organization between the Transition Date and March 31, 2019, and, among other things, remained eligible to receive his 2018 annual corporate bonus as determined by the Compensation Committee. Mr. Swade's employment was terminated by the Company without Cause (as such term is defined in his employment agreement), effective on March 31, 2019, and Mr. Swade was entitled to severance payments equal to 150% of his base salary and target cash bonus, continued health plan premium payments for up to 18 months, and accelerated vesting of all unvested restricted stock. The cash severance payment for Mr. Swade was made in a lump sum.

None of our severance arrangements provide for tax gross ups in connection with severance benefits following a change in control or otherwise (except for Mr. Raiford, who may receive a tax gross up in connection with his continued health plan premium payments). All severance payments are subject to the execution of a release of claims by the applicable NEO in favor of the Company and continued compliance with applicable restrictive covenants, which generally provide for non-competition and non-solicitation restrictions for 12 months.

Equity Award Acceleration

In addition to the severance benefits and payments described above, in the event of an Acquisition (as defined in the 2007 Equity Plan and referred to herein as a "change in control"), the 2007 Equity Plan provides for certain accelerated vesting of awards thereunder. Except as otherwise noted in the severance arrangements above, effective immediately prior to the occurrence of a change in control, (a) for equity grants prior to June 2016: an additional 25% of the number of shares covered by the restricted stock award will become vested and the remaining unvested shares subject to the restricted stock award continuing to vest pursuant to the vesting schedule set forth in the award, except that the vesting schedule will be shortened by 12 months, and (b) for equity grants since June 2016, an additional one-third of the number of shares covered by the restricted stock award will become vested and the remaining unvested shares subject to the restricted stock award continuing to vest pursuant to the vesting schedule set forth in the award, except that the vesting schedule will be shortened by 12 months.

POTENTIAL PAYMENTS UPON TERMINATION OR UPON CHANGE IN CONTROL

The table below shows potential payments to the NEOs (other than Mr. Swade, whose payments upon termination of employment are described below) with severance or change in control arrangements upon termination or upon a change in control of our Company. The amounts shown assume that termination and/or change in control was effective as of December 31, 2019, the last day of our fiscal year, and are estimates of the amounts that would have been paid to or realized by the NEOs (other than Mr. Swade) upon such a termination or change in control on such date. The actual amounts to be paid or realized can only be determined at the time of an NEO's termination or following a change in control.

	Termination without Cause or for Good Reason(1)	Termination upon Death or Disability	Change in Control	Termination without Cause or for Good Reason following Change in Control
Franklin Hobbs				
Cash Severance	$1,000,000	$—	$—	$1,000,000
Stock Awards(2)	1,566,500	1,566,500	601,784	1,566,500
Health Benefits	—(3)	—	—(3)	—(3)
	$2,566,500	$1,566,500	$601,784	$2,566,500
Daryl Raiford				
Change in Control Bonus(4)	$—	$—	$1,060,000	$1,060,000
Cash Severance	1,250,000	—	—	2,500,000
Stock Awards(2)	—	—	203,778	407,555
Health Benefits	15,773	—	—	15,773
	$1,265,773	$—	$1,263,778	$3,983,328
Anthony Scarfo				
Cash Severance	$700,000	$—	$—	$1,050,000
Stock Awards(2)	—	—	216,910	433,800
Health Benefits	14,291	—	—	21,436
	$714,291	$—	$216,910	$1,505,236
Steven Bruny				
Cash Severance	$—	$—	$—	$175,000
Stock Awards(2)	—	—	218,245	218,245
Health Benefits	—	—	—	7,887
	$—	$—	$218,245	$401,132

(1) Represents the severance benefits that the NEO would be eligible to receive absent a change in control.

(2) These amounts represent the gains that would be realized on the acceleration of unvested restricted shares and performance-based stock units in accordance with the NEOs' respective employment and/or grant agreements. The gains were calculated by multiplying our closing stock price of $4.82 on December 31, 2018 by the number of shares (or shares underlying PSUs) that would accelerate.

(3) Although Mr. Hobbs was entitled to health benefits, he has elected not to obtain his current health benefits from the Company and accordingly, we have not included any potential health benefit payments in the table

(4) Mr. Raiford is not entitled to a change in control bonus unless a material transaction is consummated. If he becomes entitled to severance at any time prior to such a material transaction, he will not receive this change in control bonus. If he becomes entitled to severance at any time after payment of the change in control bonus in connection with such a material transaction, he will not receive any additional change in control bonus upon termination.

STOCKHOLDER PROPOSALS FOR INCLUSION IN 2020 PROXY STATEMENT

To be considered for inclusion in the proxy statement relating to our annual meeting of stockholders to be held in 2020, stockholder proposals must be received at our principal executive offices no later than December 27, 2019, which is 120 calendar days before the date of our proxy statement released to our stockholders in connection with the prior year's annual meeting of stockholders, and must otherwise comply with the rules promulgated by the SEC. If the date of next year's annual meeting is changed by more than 30 days from the anniversary date of this year's annual meeting on June 5, 2019, then the deadline is a reasonable time before we begin to print and mail proxy materials.

STOCKHOLDER NOMINATIONS AND PROPOSALS FOR PRESENTATION AT 2020 ANNUAL MEETING

According to our by-laws, we must receive proposals of stockholders and director nominations intended to be presented at the 2020 Annual Meeting but not included in the proxy statement by the close of business on March 7, 2020, but not before February 6, 2020, which is not later than the ninetieth (90th) day nor earlier than the one hundred twentieth (120th) day prior to the first anniversary of the date of the 2019 Annual Meeting. Such proposals must be delivered to the Secretary of the Company at our principal executive office. However, in the event the 2020 Annual Meeting is scheduled to be held on a date before May 6, 2020, or after August 14, 2020, which are dates 30 days before or 70 days after the first anniversary of our 2019 Annual Meeting, then your notice must be received by us at our principal executive office not earlier than the close of business on the 120th day prior to such annual meeting and not later than the close of business on the later of the 90th day before the scheduled date of such annual meeting or the 10th day after the day on which we first make a public announcement of the date of such annual meeting. Any proposals that are not made in accordance with the above standards may not be presented at the 2020 Annual Meeting. SEC rules permit management to vote proxies in its discretion in certain cases if the stockholder does not comply with this deadline and, in certain other cases notwithstanding the stockholder's compliance with this deadline.

STOCKHOLDERS SHARING THE SAME ADDRESS

We have adopted a procedure called "householding." Under this procedure, we are delivering only one copy of the annual report and Proxy Statement to multiple stockholders who share the same address, unless we have received contrary instructions from an affected stockholder. Stockholders who participate in householding will continue to receive separate proxy cards.

We will deliver promptly upon written or oral request a separate copy of the annual report and the Proxy Statement to any stockholder at a shared address to which a single copy of either of those documents was delivered. To receive a separate copy of the annual report or Proxy Statement, please submit your request to Broadridge Financial Solutions by calling 1-800-579-1639 to request delivery of paper copies through the Internet or by e-mail, or in writing addressed to Ribbon Communications Inc., 4 Technology Park Drive, Westford, MA 01886 Attn: Investor Relations.

If you are a holder of record and would like to revoke your householding consent and receive a separate copy of the annual report or Proxy Statement in the future, please contact Broadridge Householding Department, 51 Mercedes Way, Edgewood, NY 11717 or by calling 1-800-542-1061. You will be removed from the householding program within 30 days of receipt of the revocation of your consent.

Any stockholders of record who share the same address and currently receive multiple copies of our annual report and Proxy Statement who wish to receive only one copy of these materials per household in the future should contact Broadridge Householding Department at the contact information listed above to participate in the householding program.

A number of brokerage firms have instituted householding. If you hold your shares in "street name," please contact your bank, broker or other holder of record to request information about householding.

FORM 10-K

Our Annual Report on Form 10-K/A for the year ended December 31, 2018, which was filed with the SEC on March 5, 2019, is being delivered to stockholders in connection with this proxy solicitation. With the payment of an appropriate processing fee, we will provide copies of the exhibits to our Annual Report on Form 10-K/A. Please address all such requests to the Investor Relations department at our principal executive offices at 4 Technology Park Drive, Westford, MA 01886.

OTHER MATTERS

Our Board knows of no other matters to be submitted at the meeting and the deadline under our by-laws for submission of matters by stockholders has passed. If any other matters properly come before the meeting, it is the intention of the persons named in the enclosed form of proxy to vote the shares they represent in their discretion.

The accompanying proxy is solicited by and on behalf of our Board. We will pay the costs of soliciting proxies from stockholders. In addition to soliciting proxies by mail, by telephone and via the Internet, our directors, executive officers and other employees may solicit proxies, either personally or by other electronic means, on our behalf, without special compensation. We will also request brokerage houses, custodians, nominees and fiduciaries to forward copies of the proxy material to those persons for whom they hold shares and request instructions for voting the proxies. We will reimburse such brokerage houses and other persons for their reasonable expenses in connection with this distribution.

By Order of the Board of Directors,

Justin K. Ferguson
Executive Vice President, General Counsel and
Corporate Secretary

Westford, Massachusetts
April 25, 2019

APPENDIX A

RIBBON COMMUNICATIONS INC.

Discussion of Non-GAAP Financial Measures

Ribbon Communications management uses several different financial measures, both GAAP and non-GAAP, in analyzing and assessing the overall performance of the business, making operating decisions, planning and forecasting future periods, and determining payments under compensation programs. Our annual financial plan is prepared both on a GAAP and non-GAAP basis, and the non-GAAP annual financial plan is approved by our board of directors. Continuous budgeting and forecasting for revenue and expenses are conducted on a non-GAAP basis (in addition to GAAP) and actual results on a non-GAAP basis are assessed against the annual financial plan. We consider the use of non-GAAP financial measures helpful in assessing the core performance of our continuing operations and when planning and forecasting future periods. By continuing operations, we mean the ongoing results of the business adjusted for acquisition-related revenue as a result of purchase accounting and the related cost of revenue, the impact of the new revenue standard, and excluding certain expenses and credits, including, but not limited to stock-based compensation, amortization and impairment of intangible assets, acquisition-related facilities adjustments, settlement expense, certain litigation costs, cancelled debt offering costs, merger integration costs, acquisition- and integration-related expense, restructuring, the gains on the sales of intangible assets and tax benefits arising from purchase accounting and tax reform. While our management uses non-GAAP financial measures as a tool to enhance their understanding of certain aspects of our financial performance, our management does not consider these measures to be a substitute for, or superior to, GAAP measures. In addition, our presentations of these measures may not be comparable to similarly titled measures used by other companies. These non-GAAP financial measures should not be considered alternatives for, or in isolation from, the financial information prepared and presented in accordance with GAAP.

Investors are cautioned that there are material limitations associated with the use of non-GAAP financial measures as an analytical tool. In particular, many of the adjustments to Ribbon's financial measures reflect the exclusion of items that are recurring and will be reflected in our financial results for the foreseeable future.

Acquisition-Related Revenue and Cost of Revenue; Impact of New Revenue Standard

We provide the supplementary non-GAAP financial measures, non-GAAP Product revenue, non-GAAP Service revenue and non-GAAP Total revenue, which include revenue related to the acquisitions of GENBAND and Edgewater that we would have recognized but for the purchase accounting treatment of these transactions. We also include eliminated revenue resulting from our adoption in 2018 of the new revenue recognition standard. Because GAAP accounting requires the elimination of this revenue, as well as the impact on future revenue of our adoption in 2018 of the new revenue standard, GAAP results alone do not fully capture all of our economic activities. These non-GAAP adjustments are intended to reflect the full amounts of such revenue and the related cost of revenue. We include these adjustments to allow for more complete comparisons to the financial results of our historical operations, forward-looking guidance and the financial results of peer companies. We believe these adjustments are useful to management and investors as a measure of the ongoing performance of the business. These adjustments do not accelerate revenue, but instead include revenue (and the related cost of revenue) that would have been recognized in our 2017 and 2018 results, but for the purchase accounting and new revenue standard adjustments required by GAAP.

Stock-Based Compensation

Stock-based compensation expense is different from other forms of compensation, as it is a non-cash expense. For example, a cash salary generally has a fixed and unvarying cash cost. In contrast, the expense associated with an equity-based award is generally unrelated to the amount of cash ultimately received by the employee, and the cost to us is based on a stock-based compensation valuation methodology, subjective assumptions and the variety of award types, all of which may vary over time. We evaluate performance without these measures because stock-based compensation expense is influenced by the Company's stock price and other factors such as volatility and interest rates that are beyond our control. The expense related to stock-based awards is generally not controllable in the short-term and can vary significantly based on the timing, size and nature of awards granted. As such, we do not include such charges in our operating plans, and we believe that presenting non-GAAP operating results that exclude stock-based compensation provides investors with visibility and insight into our management's method of analysis and the Company's core operating performance. It is reasonable to expect that stock-based compensation will continue in future periods.

Amortization of Intangible Assets

We exclude the amortization of acquired intangible assets from non-GAAP expense and income measures. These amortization amounts are inconsistent in frequency and amount and are significantly impacted by the timing and size of acquisitions. Although we exclude amortization of acquired intangible assets from our non-GAAP expenses, we believe that it is important for investors to understand that intangible assets contribute to revenue generation. We believe that excluding the non-cash amortization of intangible assets facilitates the comparison of our financial results to our historical operating results and to other companies in our industry as if the acquired intangible assets had been developed internally rather than acquired. Amortization of intangible assets that relate to past acquisitions will recur in future periods until such intangible assets have been fully amortized.

Impairment of Intangible Assets

In the fourth quarter of 2017, we discontinued our ongoing development of certain intangible assets that we had previously acquired, as we had determined that there were no alternative uses of the technology within either our existing or future product lines. As a result, we recorded an impairment charge of $5.5 million to write down the carrying value of the assets to zero. Had we developed those intangible assets internally and made the decision to discontinue their ongoing development, we would have ceased work on such development projects and eliminated the related future costs. Because we do not capitalize these costs, there would have been no asset to write off. As a result, we believe that excluding non-cash impairment charges from our non-GAAP operating results as if these impaired intangible assets had been developed internally rather than acquired facilitates a comparison to our historical operating results and to other companies in our industry.

Acquisition-Related Facilities Adjustments

GAAP accounting requires that the deferred rent liability of an acquired company be written off as part of purchase accounting and that the combined company's rent expense on a straight-line basis begin as of the acquisition date. As a result, we recorded more rent expense than would have been recognized but for the purchase accounting treatment of GENBAND's assumed deferred rent liability. We include this adjustment, which relates to the acquisition of GENBAND, to allow for more complete comparisons to the financial results of our historical operations, forward-looking guidance and the financial results of peer companies. We believe these adjustments provide an indication of the rent expense that would have been recognized, but for the purchase accounting in connection with the acquisition of GENBAND.

Settlement Expense

In the first quarter of 2018, we recorded $1.7 million of expense related to settlements, comprised of $1.4 million for the settlement of litigation in connection with our acquisition of Taqua LLC and $0.3 million of patent litigation settlement expense. In the third quarter of 2017, we recorded $1.6 million of expense related to potential fines in connection with the then-ongoing SEC investigation, which we paid to the SEC, along with an additional $0.3 million recorded in the fourth quarter of 2017, in the third quarter of 2018. These amounts are included as components of general and administrative expense. We believe that such settlement costs are not part of our core business or ongoing operations, are unplanned and generally not within our control. Accordingly, we believe that excluding costs such as the SEC potential fines and patent litigation settlement expense facilitates the comparison of our financial results to our historical operating results and to other companies in our industry.

Litigation Costs

In connection with certain ongoing litigation between GENBAND, as plaintiff, and one of its competitors, we have incurred litigation costs beginning in the fourth quarter of 2017. In March 2018, we filed litigation on behalf of Sonus against the same competitor asserting additional intellectual property infringement. We expect to incur significant future litigation costs related to these matters. These costs are included as a component of general and administrative expense. We believe that such costs are not part of our core business or ongoing operations, are unplanned and generally not within our control. Accordingly, we believe that excluding the litigation costs related to this specific legal matter facilitates the comparison of our financial results to our historical operating results and to other companies in our industry.

Cancelled Debt Offering Costs

In November 2018, we announced that we intended to offer, subject to market conditions and other factors, $150 million aggregate principal amount of convertible senior notes due 2023 in a private offering to qualified institutional buyers. We expected to grant the initial purchasers a 30-day option to purchase up to an additional $25 million aggregate principal amount of such notes, solely to cover over-allotments, if any. On the same day as our announcement, we decided not to proceed with this offering, as we believed that then-current market conditions were not conducive for an offering on terms that would be in the best interests of our stockholders. In connection with this offering, we incurred $1.0 million of expense. We do not consider these debt offering costs to be related to the continuing operations of the Company. We believe that excluding these cancelled debt offering costs facilitates the comparison of our financial results to our historical operating results and to other companies in our industry.

Acquisition- and Integration-Related Expense

We consider certain acquisition- and integration-related costs to be unrelated to the organic continuing operations of our acquired businesses and the Company and they are generally not relevant to assessing or estimating the long-term performance of the acquired assets. In addition, the size, complexity and/or volume of an acquisition, which often drives the magnitude of acquisition- and integration-related costs, may not be indicative of future acquisition- and integration-related costs. By excluding these acquisition- and integration-related costs from our non-GAAP measures, management is better able to evaluate our ability to utilize our existing assets and estimate the long-term value that acquired assets will generate for us. We exclude certain acquisition- and integration-related costs to allow more accurate comparisons of our financial results to our historical operations, forward-looking guidance and the financial results of less acquisitive peer companies. In addition, we believe that providing supplemental non-GAAP measures that exclude these items allows management and investors to consider the ongoing operations of the business both with and without such expenses.

Restructuring

We have recorded restructuring expense to streamline operations and reduce operating costs by closing and consolidating certain facilities and reducing our worldwide workforce. We review our restructuring accruals regularly and record adjustments (both expense and credits) to these estimates as required. We believe that excluding restructuring expense and credits facilitates the comparison of our financial results to our historical operating results and to other companies in our industry, as there are no future revenue streams or other benefits associated with these costs.

Gain on the Sale of Intangible Asset

In the second quarter of 2017, we sold an intangible asset that we had acquired in connection with a previous acquisition. This amount is included as a component of other income, net. We believe that such gains are not part of our core business or ongoing operations, we had not used the intangible asset in connection with revenue-producing activities and would not have used it as such in the future. Accordingly, we believe that excluding from our results the other income arising from this sale facilitates the comparison of our financial results to our historical results and to other companies in our industry.

Tax Benefits Arising from Purchase Accounting and Tax Reform

In the third quarter of 2018, we reduced our valuation allowance in connection with our acquisition of Edgewater, resulting in an income tax benefit of $0.8 million. In the fourth quarter of 2018, we recorded an adjustment to that amount, resulting in income tax expense of $0.1 million for a net tax benefit of $0.7 million related to this acquisition. In the fourth quarter of 2017, we reduced our valuation allowance in connection with the GENBAND transaction, resulting in an income tax benefit of $16.4 million. In addition, we recognized an income tax benefit of $4.8 million related to the Tax Cut and Jobs Act of 2017. We believe that such benefits are not part of our core business or ongoing operations, as they are either the result of acquisitions or new tax legislation, neither of which relates to our revenue-producing activities. Accordingly, we believe that excluding the net benefits arising from these adjustments to our income tax provision facilitates the comparison of our financial results to our historical results and to other companies in our industry.

Adjusted EBITDA

We use Adjusted EBITDA as a supplemental measure to review and assess our performance. We calculate Adjusted EBITDA by excluding from net income (loss): interest income (expense), net; income tax benefit (provision); depreciation; and amortization of intangible assets. In addition, we exclude from net income (loss): adjustments to revenue and cost of revenue related to revenue reductions resulting from purchase accounting and adoption of the new revenue standard; stock-based compensation expense; settlement expense; certain litigation costs; merger integration costs; acquisition-related facilities adjustments; acquisition- and integration-related expense; restructuring; and other income, net. In general, we add back the expenses that we consider to be non-cash and/or not part of our ongoing operations. Adjusted EBITDA is a non-GAAP financial measure that is used by our investing community for comparative and valuation purposes. We disclose this metric to support and facilitate our dialogue with research analysts and investors. Other companies may calculate Adjusted EBITDA differently than we do, limiting its usefulness as a comparative measure.

We believe that providing non-GAAP information to investors, in addition to the GAAP presentation, will allow investors to view the financial results in the way management views them. We further believe that providing this information helps investors to better understand our core financial and operating performance and evaluate the efficacy of the methodology and information used by our management to evaluate and measure such performance.

RIBBON COMMUNICATIONS INC.
(in thousands, except percentages)
(unaudited)

	Year ended December 31, 2018	Year ended December 31, 2017
GAAP Total revenue	$577,905	$329,942
Acquisition-related revenue adjustment	24,082	23,280
Adjustment for new revenue standard	10,045	—
Non-GAAP Total revenue	$612,032	$353,222
GAAP Net loss	$(76,810)	$(35,252)
Acquisition-related revenue adjustment	24,082	23,280
Acquisition-related cost of revenue adjustment	(1,977)	(10,364)
Adjustment for new revenue standard	10,045	—
Adjustment to cost of revenue for new revenue standard	(110)	—
Stock-based compensation	11,072	25,657
Amortization of intangible assets	49,723	17,112
Impairment of intangible assets	—	5,471
Acquisition-related facilities adjustments	966	—
Settlement expense	1,730	1,900
Litigation costs	7,682	373
Cancelled debt offering costs	1,003	—
Acquisition- and integration-related expense	16,951	14,763
Restructuring	17,015	9,436
Gain on the sale of intangible asset	—	(576)
Tax benefits arising from purchase accounting and tax reform	(718)	(21,155)
Non-GAAP net income	$60,654	$30,645
Earnings (loss) per share:		
GAAP Loss per share	$(0.74)	$(0.60)
Acquisition-related revenue adjustment	0.23	0.38
Acquisition-related cost of revenue adjustment	(0.02)	(0.17)
Adjustment for new revenue standard	0.10	—
Adjustment to cost of revenue for new revenue standard	*	—
Stock-based compensation	0.11	0.43
Amortization of intangible assets	0.48	0.29
Impairment of intangible assets	—	0.09
Acquisition-related facilities adjustments	0.01	—
Settlement expense	0.02	0.03
Litigation costs	0.07	0.01
Cancelled debt offering costs	0.01	—
Acquisition- and integration-related expense	0.16	0.25
Restructuring	0.16	0.16
Gain on the sale of intangible asset	—	(0.01)
Tax benefits arising from purchase accounting and tax reform	(0.01)	(0.35)
Non-GAAP Diluted earnings per share	$0.58	$0.51
Shares used to compute diluted earnings per share or (loss) per share		
GAAP Shares used to compute loss per share	103,916	58,822
Non-GAAP Shares used to compute diluted earnings per share	104,438	59,639
Adjusted EBITDA:		
GAAP Net loss	$(76,810)	(35,252)
Interest expense (income), net	4,230	(263)
Income tax provision	3,400	(18,440)
Depreciation	11,200	8,486
Amortization of intangible assets	49,723	17,112
Impairment of intangible assets	—	5,471
Acquisition-related revenue adjustment	24,082	23,280
Acquisition-related cost of revenue adjustment	(1,977)	(10,364)
Adjustment for new revenue standard	10,045	—
Adjustment to cost of revenue for new revenue standard	(110)	—
Stock-based compensation	11,072	25,657
Acquisition-related facilities adjustment	966	—
Settlement expense	1,730	1,900
Litigation costs	7,682	373
Cancelled debt offering costs	1,003	—
Acquisition- and integration-related expense	16,951	14,763
Restructuring	17,015	9,436
Other expense (income), net	3,772	(1,274)
Non-GAAP Adjusted EBITDA	$83,974	$40,885

* Less than $0.01 impact on earnings (loss) per share

RIBBON COMMUNICATIONS INC.
2019 INCENTIVE AWARD PLAN

1. *Purpose.*

The purpose of this Ribbon Communications Inc. 2019 Incentive Award Plan (as amended from time to time, the "Plan") is to advance the interests of the stockholders of Ribbon Communications Inc., a Delaware corporation (the "Company"), by enhancing the Company's ability to attract, retain and motivate persons who are expected to make important contributions to the Company and by providing such persons with equity ownership opportunities and performance-based incentives that are intended to align their interests with those of the Company's stockholders. Except where the context otherwise requires, the term "Company" shall include any of the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code") (and any other parent or subsidiary of the Company as defined and interpreted for purposes of Form S-8 under the Securities Act of 1933, as amended (the "Securities Act") or any successor form). The Plan shall be effective as of the date of approval by the Company's stockholders at its 2019 annual meeting of stockholders (the "Effective Date") and no Awards shall be granted prior to the Effective Date. No awards may be granted under the Company's Amended and Restated Stock Incentive Plan (the "Existing Plan") on or after the Effective Date; *provided* that, to the extent the Plan is not approved by the Company's stockholders at its 2019 annual meeting of stockholders, the Plan shall not become effective, the Existing Plan will remain in effect in accordance with its terms, and awards may be granted under the Existing Plan on and after the date of such annual meeting without regard for the terms herein.

2. *Eligibility.*

All of the Company's employees, officers, and non-employee directors (each, a "Director"), as well as consultants and advisors to the Company (as the terms consultants and advisors are defined and interpreted for purposes of Form S-8 under the Securities Act or any successor form) (each, an "Eligible Individual") are eligible to receive options, stock appreciation rights ("SARs"), restricted stock, restricted stock units (including, without limitation, performance stock units), and other stock- or cash-based awards (each, an "Award") under the Plan. Each Eligible Individual who receives an Award under the Plan is deemed a "Participant".

3. *Administration and Delegation.*

(a) *Administration.* Subject to any delegation pursuant to Sections 3(b) and (c), the Plan will be administered by the Board. The Board shall have authority to grant Awards and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Board may construe and interpret the terms of the Plan and any Award agreements entered into under the Plan. The Board may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem expedient to carry the Plan into effect and it shall be the sole and final judge of such expediency. All decisions by the Board shall be made in the Board's sole discretion and shall be final and binding on all persons having or claiming any interest in the Plan or in any Award. No director or person acting pursuant to the authority delegated by the Board shall be liable for any action or determination relating to or under the Plan or any Award, to the extent such action or determination is made in good faith.

(b) *Appointment of Committees.* To the extent permitted by applicable law, the Board may delegate any or all of its powers under the Plan to one or more committees or subcommittees of the

Board (each, a "Committee"). All references in the Plan to the "Board" shall mean the Board or a Committee or the officers referred to in Section 3(c) to the extent that the Board's powers or authority under the Plan have been delegated to such Committee or officers.

(c) *Delegation to Officers.* Subject to any requirements of applicable law (including as applicable Sections 152 and 157(c) of the General Corporation Law of the State of Delaware), the Board may delegate to one or more officers of the Company the power to grant Awards (subject to any limitations under the Plan) to Eligible Individuals and to exercise such other powers under the Plan as the Board may determine, provided that the Board shall fix the maximum number of shares subject to Awards that the officers may grant, and the time period in which the Awards may be granted; and provided further, that no officer shall be authorized to grant Awards to any "executive officer" of the Company (as defined by Rule 3b-7 under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) or to any "officer" of the Company (as defined by Rule 16a-1(f) under the Exchange Act).

4. *Stock Available for Awards.*

(a) *Number of Shares.* Subject to Section 4(b) and adjustment under Section 10, the aggregate number of shares of common stock, $0.0001 par value per share, of the Company (the "Common Stock") reserved for Awards under the Plan is equal to 7,000,000, plus the number of shares of Common Stock previously reserved for issuance under the Existing Plan that remained available for grant as of the Effective Date. Notwithstanding anything to the contrary herein, no more than 7,000,000 shares of Common Stock may be issued as Incentive Stock Options (as defined below) under the Plan. Shares issued under the Plan may consist in whole or in part of authorized but unissued shares or treasury shares (if any).

(b) *Share Count.* Shares issued pursuant to Awards will count against the shares of Common Stock available for issuance under the Plan as one (1) share for every one (1) share issued in connection with the Award. If any Award (or award under the Existing Plan, the Company's 2008 Stock Incentive Plan or the Company's 2012 Amended Performance Technologies, Incorporated Omnibus Incentive Plan (collectively, the "Prior Plans")) expires or is terminated, surrendered or canceled without having been fully exercised, is cash-settled, is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award (or award under a Prior Plan) being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right), then shares of Common Stock covered by such Award (or award under a Prior Plan) shall, to the extent of such termination, surrender, cancellation, cash-settlement or forfeiture, again become available for the grant of Awards under the Plan. Notwithstanding the foregoing, (i) shares tendered by the Participant or withheld by the Company in payment of the exercise price of an Option, (ii) shares tendered by the Participant or withheld by the Company to satisfy any tax withholding obligation with respect to an Award, (iii) shares subject to a SAR that are not issued in connection with its share settlement on exercise thereof, and (iv) shares of Common Stock repurchased by the Company on the open market using the proceeds from the exercise of an Award, shall not increase the number of shares of Common Stock available for the future grant of Awards. In the case of Incentive Stock Options, the foregoing provisions shall be subject to any limitations under the Code. Additionally, in the event that a company acquired by the Company or any subsidiary thereof or with which the Company or any subsidiary thereof combines has shares available under a pre-existing plan approved by its stockholders and not adopted in contemplation of such acquisition or combination, the shares available for grant pursuant to the terms of such pre-existing plan (as adjusted, to the extent appropriate, using the exchange ratio or other adjustment or valuation ratio or formula used in such acquisition or combination to determine the consideration payable to the holders of common stock of the entities party to such acquisition or combination) may be used for Awards under the Plan and shall not reduce the shares of Common Stock authorized for grant under the Plan (and shares of Common Stock

subject to such Awards shall not be added to the shares available for Awards under the Plan as provided in Section 4(a) above); provided that Awards using such available shares of Common Stock shall not be made after the date awards or grants could have been made under the terms of the pre-existing plan, absent the acquisition or combination, and shall only be made to individuals who were not employed by or providing services to the Company or its subsidiaries immediately prior to such acquisition or combination.

(c) *Limit on Awards to Directors.* Notwithstanding any provision to the contrary in the Plan, during any calendar year, the sum of the grant date fair value (determined in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718, or any successor thereto) of Awards and the amount of any cash fees granted or paid to a Director, in respect of such Director's services as a non-employee director for such year, shall not exceed $650,000. The Board may make exceptions to this limit for individual Directors in extraordinary circumstances, as the Board may determine in its discretion, provided that the Director receiving such additional compensation may not participate in the decision to award such compensation or in other contemporaneous compensation decisions involving Directors.

(d) *Substitute Awards.* In connection with a corporate transaction with another entity, such as a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Board may grant Awards in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof. Substitute Awards may be granted on such terms as the Board deems appropriate in the circumstances, notwithstanding any limitations on Awards contained in the Plan (subject to compliance with the applicable requirements of Section 424 of the Code and Section 409A of the Code (together with the Department of Treasury regulations and other interpretive guidance issued thereunder, "Section 409A")). Substitute Awards shall not count against the overall share limit set forth in Section 4(a), except as may be required by reason of Section 422 and related provisions of the Code.

5. *Stock Options.*

(a) *General.* The Board may grant options to purchase Common Stock (each, an "Option") and determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to applicable federal or state securities laws, as it considers necessary or advisable. An Option that is not an Incentive Stock Option shall be designated a "Nonstatutory Stock Option."

(b) *Incentive Stock Options.* An Option that the Board intends to be an "incentive stock option" as defined in Section 422 of the Code (an "Incentive Stock Option") shall only be granted to employees of the Company, any of its present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Code, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code, and shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. The Company shall have no liability to a Participant, or any other party, if an Option (or any part thereof) that is intended to be an Incentive Stock Option is not an Incentive Stock Option or for any action taken by the Board, including without limitation the conversion of an Incentive Stock Option to a Nonstatutory Stock Option.

(c) *Exercise Price.* The Board shall establish the exercise price of each Option and specify such exercise price in the applicable option agreement. Subject to Section 4(d), the exercise price shall be not less than 100% of the fair market value (as defined below) on the date the Option is granted.

(d) *Duration of Options.* Each Option shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable option agreement; provided that, notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of an Option (other than an Incentive Stock Option) (i) the exercise of the Option is prohibited by applicable law, as determined by the Company, or (ii) shares of Common Stock may not be purchased or sold by the applicable Participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the Option shall be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, however, in no event shall the extension last beyond the term of the applicable Option (which, in no event will exceed 10 years from the date of grant).

(e) *Exercise of Option.* Options may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Company, together with payment in full as specified in Section 5(f) for the number of shares for which the Option is exercised and any other documentation required by the Board. The form of such notice of exercise shall be determined by the Company in its sole discretion. Shares of Common Stock subject to the Option will be delivered by the Company as soon as reasonably practicable following exercise.

(f) *Payment Upon Exercise.* Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for as follows:

(i) in cash or by check, payable to the order of the Company (or, to the extent determined appropriate by the Company in lieu of cash or check, through electronic payment through a stock plan administrator or other third party);

(ii) except as may otherwise be provided in the applicable option agreement, by (A) delivery of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding, and (B) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(iii) to the extent provided for in the applicable option agreement or approved by the Board, in its sole discretion, (A) by the withholding of shares of Common Stock otherwise issuable under an Award or (B) by delivery (either by actual delivery or attestation) of shares of Common Stock owned by the Participant valued in the manner determined by (or in a manner approved by) the Board, provided (x) such method of payment is then permitted under applicable law, (y) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Board in its sole discretion and (z) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements;

(iv) to the extent permitted by applicable law and provided for in the applicable option agreement or approved by the Board, in its sole discretion, by payment of such other lawful consideration as the Board may determine; or

(v) by any combination of the above permitted forms of payment.

(g) *Fair Market Value.* Fair market value of a share of Common Stock for purposes of establishing the exercise price of each Option under Section 5(c) and the exercise price of each SAR under Section 6(c) will be determined as follows:

(i) if the Common Stock trades on a national securities exchange, the closing sale price (for the primary trading session) on the date of grant; or

(ii) if the Common Stock does not trade on any such exchange, the average of the closing bid and ask prices for the date of grant as reported by the principal market on which the Common Stock is then traded, or if there are no such closing bid and ask prices, the average of the bid and ask prices as reported by any other commercial service for the date of grant; or

(iii) if the Common Stock does not trade on any such exchange and there are no bid and asked prices available for determination under Section 5(g)(ii), the fair market value as determined by the Board in its discretion.

For any date that is not a trading day, the fair market value of a share of Common Stock for such date will be determined by using the closing sale price or average of the bid and asked prices, as appropriate, for the immediately following trading day and with the timing in the formulas above adjusted accordingly. The Board can substitute a particular time of day or other measure of "closing sale price" or "bid and asked prices" if appropriate because of exchange or market procedures or can, in its sole discretion, use weighted averages either on a daily basis or such longer period as complies with Section 409A.

(h) *Limitation on Repricing.* Other than pursuant to Section 10, the Board shall not without the approval of the Company's stockholders: (i) lower the exercise price of an Option, (ii) cancel an Option when the exercise price per share exceeds the fair market value of one share in exchange for cash or another Award (other than in connection with a Change in Control), or (iii) take any other action with respect to an Option that would be treated as a repricing under the rules and regulations of the principal U.S. national securities exchange on which the shares of Common Stock are listed.

(i) *No Reload Options.* No Option granted under the Plan shall contain any provision entitling the Participant to the automatic grant of additional Options in connection with the exercise of the original Option.

(j) *No Dividend Equivalents.* No Option shall provide for the payment or accrual of dividend equivalents.

6. *Stock Appreciation Rights.*

(a) *General.* The Board may grant Awards consisting of a SAR entitling the holder, upon exercise, to receive an amount in Common Stock or cash or a combination thereof (such form to be determined by the Board) determined in whole or in part by reference to appreciation, from and after the date of grant, in the fair market value of a share of Common Stock over the exercise price established pursuant to Section 6(c). The date as of which such appreciation or other measure is determined shall be the exercise date.

(b) *Grants.* SARs may be granted in tandem with, or independently of, Options granted under the Plan.

(1) *Tandem Awards.* When SARs are expressly granted in tandem with Options, (i) the SAR will be exercisable only at such time or times, and to the extent, that the related Option is exercisable (except to the extent designated by the Board in connection with a Reorganization

Event (as defined below)) and will be exercisable in accordance with the procedure required for exercise of the related Option; (ii) the SAR will terminate and no longer be exercisable upon the termination or exercise of the related Option, except to the extent designated by the Board in connection with a Reorganization Event and except that a SAR granted with respect to less than the full number of shares covered by an Option will not be reduced until the number of shares as to which the related Option has been exercised or has terminated exceeds the number of shares not covered by the SAR; (iii) the Option will terminate and no longer be exercisable upon the exercise of the related SAR; and (iv) the SAR will be transferable only with the related Option.

(2) *Independent SARs.* A SAR not expressly granted in tandem with an Option will become exercisable at such time or times, and on such conditions, as the Board may specify in the SAR Award.

(c) *Exercise Price.* The Board shall establish the exercise price of each SAR and specify it in the applicable SAR agreement. Subject to Section 4(d) and Section 6(i), the exercise price shall not be less than 100% of the fair market value on the date the SAR is granted; provided that if the Board approves the grant of a SAR with an exercise price to be determined on a future date, the exercise price shall be not less than 100% of the fair market value on such future date.

(d) *Term.* Each SAR shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable SAR agreement; provided that, notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of a SAR (i) the exercise of the SAR is prohibited by applicable law, as determined by the Company or (ii) shares of Common Stock may not be purchased or sold by the applicable Participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the SAR shall be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, however, in no event shall the extension last beyond the term of the applicable SAR (which, in no event will exceed ten (10) years from the date of grant).

(e) *Exercise.* SARs may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Company, together with any other documents required by the Board. The form of such notice of exercise shall be determined by the Company in its sole discretion.

(f) *Limitation on Repricing.* Other than pursuant to Section 10, the Board shall not without the approval of the Company's stockholders: (i) lower the exercise price of a SAR, (ii) cancel a SAR when the exercise price per share exceeds the fair market value of one share in exchange for cash or another Award (other than in connection with a Change in Control), or (iii) take any other action with respect to a SAR that would be treated as a repricing under the rules and regulations of the principal U.S. national securities exchange on which the shares of Common Stock are listed.

(g) *No Reload Rights.* No SAR granted under the Plan shall contain any provision entitling the grantee to the automatic grant of additional SARs in connection with the exercise of the original SAR.

(h) *No Dividend Equivalents.* No SAR shall provide for the payment or accrual of dividend equivalents.

(i) *Substitution of SARs.* The Board may provide in the applicable option agreement evidencing the grant of an Option that the Board, in its sole discretion, shall have the right to substitute a SAR for such Option at any time prior to or upon exercise of such Option; provided, that such SAR shall be exercisable with respect to the same number of shares of Common Stock for which such substituted Option would have been exercisable, and shall also have the same exercise price and remaining term as the substituted Option.

7. *Restricted Stock; Restricted Stock Units.*

(a) *General.* The Board may grant Awards entitling Participants to acquire shares of Common Stock ("Restricted Stock"), subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeiture of such shares if issued at no cost) from the Participant in the event that conditions specified by the Board in the applicable Award are not satisfied prior to the end of the applicable restriction period or periods established by the Board for such Award. Instead of granting Awards for Restricted Stock, the Board may grant Awards entitling the recipient to receive shares of Common Stock or cash to be delivered at the time of (or following) the vesting of such Award ("Restricted Stock Units") (Restricted Stock and Restricted Stock Units are each referred to herein as a "Restricted Stock Award").

(b) *Terms and Conditions for all Restricted Stock Awards.* The Board shall determine the terms and conditions of a Restricted Stock Award, including the conditions for vesting, settlement and repurchase (or forfeiture) and the issue price, if any.

(c) *Additional Provisions Relating to Restricted Stock.*

(1) *Dividends.* Any dividends (whether paid in cash, stock or property) declared and paid by the Company with respect to shares of Restricted Stock ("Unvested Dividends") shall be paid to the Participant only if and when such shares become free from the restrictions on transferability and forfeitability that apply to such shares. Each payment of Unvested Dividends will be made no later than the end of the calendar year in which the dividends are paid to stockholders of that class of stock or, if later, the 15th day of the third month following the lapsing of the restrictions on transferability and the forfeitability provisions applicable to the underlying shares of Restricted Stock. No interest will be paid on Unvested Dividends.

(2) *Stock Certificates.* The Company may require that any stock certificates issued in respect of shares of Restricted Stock, as well as dividends or distributions paid on such Restricted Stock, shall be deposited in escrow by the Participant, together with a stock power endorsed in blank, with the Company (or its designee). At the expiration of the applicable restriction periods, the Company (or such designee) shall deliver the certificates no longer subject to such restrictions to the Participant or if the Participant has died, to the beneficiary designated, in a manner determined by the Board, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death (the "Designated Beneficiary"). In the absence of an effective designation by a Participant, "Designated Beneficiary" shall mean the Participant's estate.

(d) Additional Provisions Relating to Restricted Stock Units.

(1) *Settlement.* Upon the vesting of and/or lapsing of any other restrictions with respect to each Restricted Stock Unit, the Participant shall be entitled to receive from the Company in settlement of such Restricted Stock Unit such number of shares of Common Stock or an amount of cash equal to the value determined by (or in a manner approved by) the Board of such number of shares of Common Stock, as provided in the applicable Award agreement. Subject to Section 409A, the Board may, in its sole discretion, provide that settlement of Restricted Stock Units shall be deferred, on a mandatory basis or at the election of the Participant.

(2) *Voting Rights.* A Participant shall have no voting rights with respect to any Restricted Stock Units.

(3) *Dividend Equivalents.* The Award agreement for Restricted Stock Units may provide Participants with the right to receive an amount, in cash and/or shares of Common Stock, equal to any dividends or other distributions declared and paid on an equal number of outstanding shares of Common Stock ("Dividend Equivalents"); except that any such Dividend Equivalents shall be subject to the same vesting conditions and restrictions on transfer and forfeitability applicable to the underlying Restricted Stock Unit with respect to which they are paid. No interest will be paid on Dividend Equivalents.

8. *Other Stock- or Cash-Based Awards.*

Other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock or other property ("Other Stock-Based Awards"), which may include, without limitation, deferred shares or deferred stock units, as well as cash payments and other cash bonus awards ("Cash-Based Awards"), may be granted hereunder to Participants, including, without limitation, Dividend Equivalents and Awards entitling recipients to receive shares of Common Stock or cash to be delivered in the future. Such Other Stock-Based Awards and Cash-Based Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan or as payment in lieu of compensation to which a Participant is otherwise entitled (including, without limitation, annual or other cash bonuses). Subject to the provisions of the Plan, the Board shall determine the terms and conditions of each Other Stock-Based Award and Cash-Based Award, including, without limitation, any exercise or purchase price, performance goals, transfer restrictions, or vesting and forfeiture conditions applicable thereto.

Any dividends or distributions (whether paid in cash, stock or property) declared and paid by the Company with respect to shares of Common Stock granted under an Other Stock-Based Award shall be paid to the Participant only if and when such shares become free from the restrictions on transferability and forfeitability that apply to such shares and will be paid no later than the end of the calendar year in which the dividends are paid to stockholders of that class of stock or, if later, the 15th day of the third month following the lapsing of the restrictions on transferability and the forfeitability provisions applicable to the underlying Other Stock-Based Award. Any Dividend Equivalent provided in an Award agreement with respect to an Other Stock-Based Award shall be subject to the same vesting conditions and restrictions on transfer and forfeitability applicable to the Other Stock-Based Award with respect to which paid. No interest will be paid on any such dividends or Dividend Equivalents.

9. *Performance Awards.*

(a) *Performance-Based Grants.* Any Award may be made subject to the achievement of performance goals consistent with this Section 9 ("Performance Awards").

(b) *Performance Measures.* For any Performance Award, the Board may specify that the degree of vesting, settlement and/or payout (or other term or condition of the Performance Award) shall be subject to the achievement of one or more performance measures established by the Board, which may include, without limitation, the relative or absolute attainment of specified levels of one or any combination of the following: (i) bookings, (ii) backlog, (iii) revenue, (iv) gross margin ($), (v) gross profit (%), (vi) operating expenses, (vii) operating income (loss), (viii) net income (loss), (ix) earnings (loss) per share, (x) earnings before interest, taxes, depreciation and/or amortization ("EBITDA"), (xi) adjusted EBITDA, (xii) earnings before interest and/or taxes ("EBIT"), (xiii) adjusted EBIT, (xiv) cost reduction or savings, (xv) productivity ratios or other similar metrics,

(xvi) performance against budget, (xvii) cash flow from operations, (xviii) stock price, (xix) financial ratings, (xx) financial metrics and ratios, (xxi) exit rate operating metrics, (xxii) total stockholder return (whether in the absolute or measured against or in relationship to other companies comparably, similarly or otherwise situated), (xxiii) regulatory achievements or compliance (including, without limitation, regulatory body approval for commercialization of a product), (xxiv) implementation or completion of critical projects, (xxv) economic value or economic value added, (xxvi) customer satisfaction, (xxvii) working capital targets, (xxviii) organization/transformation metrics, (xxix) return measures (including but not limited to, return on assets, capital, invested capital, equity, sales or revenue), (xxx) market share, and (xxxi) any other objective or subjective measure determined by the Board.

The Board may specify that such performance measures shall be adjusted to take into account any events or circumstances determined appropriate by the Board, including, without limitation, any one or more of the following: (A) extraordinary, nonrecurring or unusual items, (B) gains or losses on acquisitions or dispositions of assets or operations, (C) the cumulative effects of changes in tax laws or accounting principles, (D) the write-down of any asset, and (E) charges for restructuring and rationalization programs. Such performance measures may vary by Participant and may be different for different Awards and may be particular to a Participant or the department, branch, line of business, subsidiary or other unit in which the Participant works and may cover such period as may be specified by the Board. Such performance measures may be calculated on generally accepted accounting principles ("GAAP") or non-GAAP basis or otherwise in accordance with applicable accounting principles or such other methodology as determined appropriate by the Board.

(3) *Adjustments.* Notwithstanding any provision of the Plan, with respect to any Performance Award, the Board may adjust downwards or upwards, the cash or number of Shares payable pursuant to such Performance Award in its discretion, and the Board may waive the achievement of the applicable performance measures. The Board shall have the power to impose such other restrictions on Performance Awards as it may deem necessary or appropriate.

10. *Adjustments for Changes in Common Stock and Certain Other Events.*

(a) *Changes in Capitalization.* In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination or exchange of shares, consolidation, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend or any other change affecting the shares of Common Stock or the share price of the Common Stock (other than an Equity Restructuring), the Board may make equitable adjustments to reflect such change with respect to: (i) the number and class of securities available under the Plan, (ii) the number and class of securities and exercise price per share of each outstanding Option and SAR, (iii) the number of shares subject to and the repurchase price per share subject to each outstanding Restricted Stock Award, (iv) the number of shares subject to and the share- and per-share-related provisions and the purchase price, if any, of each outstanding Other Stock-Based Award, and (v) any other applicable the terms and conditions of outstanding Awards (including, without limitation, any applicable performance targets and criteria). Notwithstanding the foregoing, in the event of an Equity Restructuring, the Company shall equitably adjust in the manner determined by the Board the number and class of security subject to each outstanding Award and the exercise or purchase price thereof, if applicable (and such adjustments shall be nondiscretionary and final and binding on the affected Participants and the Company) and/or the aggregate number and class of security that may be issued under the Plan (including, without limitation, any share counting provisions related thereto). "Equity Restructuring" shall mean a nonreciprocal transaction between the Company and its stockholders, such as a stock dividend, stock split, spin-off, rights offering or recapitalization through a large, nonrecurring cash dividend, that affects the number or kind of shares of Common Stock (or other securities of the Company) or the share price of

Common Stock (or other securities) and causes a change in the per-share value of the Common Stock underlying outstanding Awards.

(b) *Reorganization Events.*

(1) *Definition.* A "Reorganization Event" shall mean: (a) any merger or consolidation of the Company with or into another entity as a result of which all of the Common Stock of the Company is converted into or exchanged for the right to receive cash, securities or other property or is cancelled, (b) any exchange of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange transaction, (c) any liquidation or dissolution of the Company, or (d) any event described in Section 10(a) or any other unusual or nonrecurring transaction or event affecting the Company or any of its subsidiaries (or their respective financial statements).

(2) *Consequences of a Reorganization Event on Awards.* In connection with a Reorganization Event, the Board may take any one or more of the following actions as to all or any (or any portion of) outstanding Awards on such terms as the Board determines: (i) provide that Awards shall be assumed, or substantially equivalent awards shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof), (ii) upon written notice to a Participant, provide that the Participant's unexercised Awards will terminate immediately prior to the consummation of such Reorganization Event unless exercised by the Participant within a specified period following the date of such notice, (iii) provide that outstanding Awards shall become exercisable, realizable, or deliverable, or restrictions applicable to an Award shall lapse, in whole or in part prior to or upon such Reorganization Event, (iv) in the event of a Reorganization Event under the terms of which holders of Common Stock will receive upon consummation thereof a payment of cash and/or property for each share surrendered in the Reorganization Event (the value of such payment, the "Acquisition Price"), make or provide for a payment of cash and/or property to a Participant with a value equal to the excess, if any, of (A) the Acquisition Price times the number of shares of Common Stock subject to the Participant's Awards (to the extent the exercise price does not exceed the Acquisition Price) over (B) the aggregate exercise price of all such outstanding Awards and any applicable tax withholdings, in exchange for the termination of such Awards (and, if as of the Reorganization Event, the Board determines in good faith that there is no such excess with respect to an Award, then such Award may be terminated by the Company without payment), (v) provide that Awards will be replaced with other rights or property selected by the Board (including, in connection with a liquidation or dissolution of the Company, conversion into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof and any applicable tax withholdings)), (vi) provide that Awards cannot vest, be exercised or become payable after the Reorganization Event, and (vii) any combination of the foregoing. In taking any of the actions permitted under this Section 10(b), the Board shall not be obligated by the Plan to treat all Awards, all Awards held by a Participant, or all Awards of the same type, identically.

For purposes of clause (i) above, an Option shall be considered assumed if, following consummation of the Reorganization Event, the Option confers the right to purchase, for each share of Common Stock subject to the Option immediately prior to the consummation of the Reorganization Event, the consideration (whether cash, securities or other property) received as a result of the Reorganization Event by holders of Common Stock for each share of Common Stock held immediately prior to the consummation of the Reorganization Event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); provided, however, that if the consideration received as a result of the Reorganization Event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or

succeeding corporation, provide for the consideration to be received upon the exercise of Options to consist solely of common stock of the acquiring or succeeding corporation (or an affiliate thereof) equivalent in value (as determined by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Reorganization Event.

(c) *Change in Control.* A "Change in Control" shall mean any of the following:

(i) a transaction or series of transactions (other than an offering of Common Stock to the general public through a registration statement filed with the Securities and Exchange Commission) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) directly or indirectly acquires beneficial ownership (within the meaning of Rules 13d-3 and 13d-5 under the Exchange Act) of securities of the Company possessing more than 50% of the total combined voting power of the Company's securities outstanding immediately after such acquisition; provided, however, that the following acquisitions shall not constitute a Change in Control under this subsection (i): (A) any acquisition by the Company; (B) any acquisition by an employee benefit plan maintained by the Company, (C) any acquisition which is not a Change in Control under Section 10(c)(iii) as a result of compliance with subsections (A), (B) and (C) of Section 10(c)(iii); or (D) in respect of an Award held by a particular Participant, any acquisition by the Participant or any group of persons including the Participant (or any entity controlled by the Participant or any group of persons including the Participant);

(ii) the Incumbent Directors cease for any reason to constitute a majority of the Board;

(iii) the consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination, (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(A) which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "Successor Entity")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities,

(B) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this subsection (B) as beneficially owning 50% or more of the combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction; and

(C) immediately after which at least a majority of the members of the board of directors (or the analogous governing body) of the Successor Entity were Board members at the time of the Board's approval of the execution of the initial agreement providing for such transaction; or

(iv) the effective date of a liquidation or dissolution of the Company.

For purposes of the foregoing, "Incumbent Directors" shall mean for any period of 12 consecutive months, individuals who, at the beginning of such period, constitute the Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in Section 10(c)(i) or 10(c)(iii)) whose election or nomination for election to the Board was approved by a vote of at least a majority (either by a specific vote or by approval of the proxy statement of the Company in which such person is named as a nominee for Director without objection to such nomination) of the Directors then still in office who either were Directors at the beginning of the 12-month period or whose election or nomination for election was previously so approved. No individual initially elected or nominated as a director of the Company as a result of an actual or threatened election contest with respect to Directors or as a result of any other actual or threatened solicitation of proxies by or on behalf of any person other than the Board shall be an Incumbent Director.

Notwithstanding the foregoing, if a Change in Control constitutes a payment event with respect to any Award (or any portion of an Award) that provides for the deferral of compensation that is subject to Section 409A , to the extent required to avoid the imposition of additional taxes under Section 409A, the transaction or event described in subsection (i), (ii), (iii) or (iv) with respect to such Award (or portion thereof) shall only constitute a Change in Control for purposes of the payment timing of such Award if such transaction also constitutes a "change in control event," as defined in Treasury Regulation Section 1.409A-3(i)(5).

The Board shall have full and final authority, which shall be exercised in its sole discretion, to determine conclusively whether a Change in Control has occurred pursuant to the above definition, the date of the occurrence of such Change in Control and any incidental matters relating thereto; provided that any exercise of authority in conjunction with a determination of whether a Change in Control is a "change in control event" as defined in Treasury Regulation Section 1.409A-3(i)(5) shall be consistent with such regulation.

11. *General Provisions Applicable to Awards.*

(a) *Transferability of Awards.* Awards (other than vested shares of Restricted Stock) shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an Incentive Stock Option, pursuant to a qualified domestic relations order, and, during the life of the Participant, shall be exercisable only by the Participant; provided, however, that the Board may permit or provide in an Award for the gratuitous transfer of the Award by the Participant to or for the benefit of any immediate family member, family trust or other entity established for the benefit of the Participant and/or an immediate family member thereof if, with respect to such proposed transferee, the Company would be eligible to use a Form S-8 for the registration of the sale of the Common Stock subject to such Award under the Securities Act; provided, further, that the Company shall not be required to recognize any such transfer until such time as the Participant and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument in form and substance satisfactory to the Company confirming that such transferee shall be bound by all of the terms and conditions of the Award. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees. For the avoidance of doubt, nothing contained in this Section 11(a) shall be deemed to restrict a transfer to the Company.

(b) *Documentation.* Each Award shall be evidenced in such form (written, electronic or otherwise) as the Board shall determine. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) *Board Discretion.* Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award need not be identical, and the Board need not treat Participants uniformly.

(d) *Termination of Status.* The Board shall determine the effect on an Award of the disability, death, termination of employment, authorized leave of absence or other change in the employment or other status of a Participant and the extent to which, and the period during which, the Participant, or the Participant's legal representative, conservator, guardian or Designated Beneficiary, may exercise rights under the Award.

(e) *Withholding.* The Participant must satisfy all applicable federal, state, and local or other income and employment tax withholding obligations before the Company will deliver stock certificates or otherwise recognize ownership of Common Stock under an Award. The Company may decide to satisfy the withholding obligations through additional withholding on salary or wages. If the Company elects not to or cannot withhold from other compensation, the Participant must pay the Company the full amount, if any, required for withholding or have a broker tender to the Company cash equal to the withholding obligations. Payment of withholding obligations is due before the Company will issue any shares on exercise or release from forfeiture of an Award or, if the Company so requires, at the same time as is payment of the exercise price unless the Company determines otherwise. If provided for in an Award or approved by the Board in its sole discretion, a Participant may satisfy such tax obligations in whole or in part by delivery of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued in the manner determined by (or in a manner approved by) the Board; provided, however, except as otherwise provided by the Board, that the shares retained to satisfy such tax obligations cannot exceed the aggregate amount of such tax obligation based on the maximum statutory withholding rates in the Participant's applicable jurisdiction for federal, state, local and foreign tax purposes, including payroll taxes, that are applicable to such taxable income. Shares surrendered to satisfy tax withholding requirements cannot be subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements.

(f) *Amendment of Award.* Subject to Sections 5(h) and 6(f), the Board may amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or realization, and converting an Incentive Stock Option to a Nonstatutory Stock Option, provided either (i) that the Participant's consent to such action shall be required unless the Board determines that the action, taking into account any related action, would not materially and adversely affect the Participant or (ii) that the change is permitted under Section 10 hereof.

(g) *Conditions on Delivery of Stock.* The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Company may consider appropriate to satisfy the requirements of any applicable laws, rules or regulations.

(h) *Acceleration.* The Board may, at any time, provide in an Award agreement or otherwise that any Award shall become immediately exercisable in full or in part, free from some or all of the restrictions or conditions applicable to such Award or otherwise realizable in full or in part, as the case may be, including, without limitation, (A) upon the death or disability of the Participant, (B) in connection with retirement, termination of employment or other separation from service, or (C) in connection with a Change in Control.

(i) *Limitations on Vesting.* Notwithstanding anything to the contrary in the Plan, no Award (other than Cash-Based Awards) or any portion thereof shall vest earlier than the first anniversary of its date of grant; provided, however, that notwithstanding the foregoing, such minimum vesting requirement shall not apply to (i) any substitute award described in Section 4(d), (ii) shares of Common Stock delivered in lieu of full-vested Cash-Based Award (or other cash awards or payments), (iii) Awards to non-employee directors of the Company that vest on the earlier of the one-year anniversary of the date of grant and the next annual meeting of stockholders which is at least 50 weeks after the immediately preceding year's annual meeting, and (iv) any additional Awards the Board may grant, up to a maximum of five percent (5%) of the available share reserve authorized for issuance under the Plan pursuant to Section 4 (subject to adjustment under Section 10); and, provided, further, that the foregoing restriction does not apply to the Board's discretion to provide for accelerated exercisability or vesting of any Awards pursuant to Section 11(h).

(j) *Treatment of Dividends and Dividend Equivalents on Unvested Awards.* Notwithstanding any other provision of the Plan to the contrary, with respect to any Award that provides for or includes a right to dividends or dividend equivalents, if dividends are declared during the period that an equity Award is outstanding, such dividends (or dividend equivalents) shall either (i) not be paid or credited with respect to such Award or (ii) be accumulated but remain subject to vesting requirement(s) to the same extent as the applicable Award and shall only be paid at the time or times such vesting requirement(s) are satisfied.

12. *Miscellaneous.*

(a) *No Right To Employment or Other Status.* No person shall have any claim or right to be granted an Award by virtue of adoption or amendment of the Plan, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan, except as expressly provided in the applicable Award.

(b) *No Rights As Stockholder; Clawback.* Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be issued with respect to an Award until becoming the record holder of such shares. In accepting an Award under the Plan, the Participant agrees to be bound by any clawback policy that the Company has in effect or may adopt in the future.

(c) *Effective Date and Term of Plan.* The Plan shall become effective on the Effective Date, subject to the approval by the Company's stockholders. No Awards shall be granted under the Plan after the tenth anniversary of the Effective Date, but Awards previously granted may extend beyond that date.

(d) *Amendment of Plan.* The Board may amend, suspend or terminate the Plan or any portion thereof at any time provided that (i) no amendment that would require stockholder approval under the rules of The NASDAQ Stock Market ("NASDAQ") (or other applicable exchange on which the Common Stock is traded) may be made effective unless and until such amendment shall have been approved by the Company's stockholders; and (ii) if the NASDAQ (or other applicable exchange on which the Common Stock is traded) amends its corporate governance rules so that such rules no longer require stockholder approval of "material amendments" to equity compensation plans, then, from and after the effective date of such amendment, no amendment to the Plan (A) materially increasing the number of shares authorized under the Plan (other than pursuant to Section 10), (B) expanding the types of Awards that may be granted under the Plan, or (C) materially expanding the class of participants eligible to participate in the Plan shall be effective unless stockholder approval is obtained.

In addition, if at any time the approval of the Company's stockholders is required as to any other modification or amendment under Section 422 of the Code or any successor provision with respect to Incentive Stock Options, the Board may not effect such modification or amendment without such approval. Unless otherwise specified in the amendment, any amendment to the Plan adopted in accordance with this Section 12(d) shall apply to, and be binding on the holders of, all Awards outstanding under the Plan at the time the amendment is adopted, provided the Board determines that such amendment does not materially and adversely affect the rights of Participants under the Plan.

(e) *Provisions for Foreign Participants.* The Board may modify Awards or Options granted to Participants who are foreign nationals or employed outside the United States or establish subplans or procedures under the Plan to recognize differences in laws, rules, regulations or customs of such foreign jurisdictions with respect to tax, securities, currency, employee benefit or other matters.

(f) *Compliance With Code Section 409A.* To the extent applicable, the Plan and all Awards shall be interpreted in accordance with Section 409A. Except as provided in individual Award agreements initially or by amendment, if and to the extent (i) any portion of any payment, compensation or other benefit provided to a Participant pursuant to the Plan in connection with his or her employment termination constitutes "nonqualified deferred compensation" within the meaning of Section 409A and (ii) the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i) of the Code, in each case as determined by the Company in accordance with its procedures, by which determinations the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six months plus one day after the date of "separation from service" (as determined under Section 409A) (the "New Payment Date"), except as Section 409A may then permit. The aggregate of any payments that otherwise would have been paid to the Participant during the period between the date of separation from service and the New Payment Date shall be paid to the Participant in a lump sum on such New Payment Date, and any remaining payments will be paid on their original schedule.

The Company and its employees, agents and representatives make no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under the Plan are determined to constitute nonqualified deferred compensation subject to Section 409A but do not to satisfy the conditions of that section. Notwithstanding any provision of the Plan to the contrary, in the event that following the Effective Date the Board determines that any Award may be subject to Section 409A, the Board may (but is not obligated to), without a Participant's consent, adopt such amendments to the Plan and the applicable Award or adopt other policies and procedures (including amendments, policies and procedures with retroactive effect), or take any other actions, that the Board determines are necessary or appropriate to (A) exempt the Award from Section 409A and/or preserve the intended tax treatment of the benefits provided with respect to the Award, or (B) comply with the requirements of Section 409A and thereby avoid the application of any penalty taxes under Section 409A.

(g) *Compliance with the Exchange Act.* Notwithstanding any other provision of the Plan to the contrary, no Participant who is a Director or an "executive officer" of the Company within the meaning of Section 13(k) of the Exchange Act shall be permitted to make payment with respect to any Awards granted under the Plan, or continue any extension of credit with respect to such payment, with a loan from the Company or a loan arranged by the Company in violation of Section 13(k) of the Exchange Act.

(h) *Data Privacy.* As a condition of receipt of any Award, each Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of personal data as described in this Section 12(h) by and among, as applicable, the Company and its subsidiaries for the exclusive purpose of implementing, administering and managing the Participant's participation in the

Plan. The Company and its subsidiaries may hold certain personal information about a Participant, including but not limited to, the Participant's name, home address and telephone number, date of birth, social security or insurance number or other identification number, salary, nationality, job title(s), any shares of stock held in the Company or any of its subsidiaries, details of all Awards, in each case, for the purpose of implementing, managing and administering the Plan and Awards (the "Data"). The Company and its subsidiaries may transfer the Data amongst themselves as necessary for the purpose of implementation, administration and management of a Participant's participation in the Plan, and the Company and its subsidiaries may each further transfer the Data to any third parties assisting the Company and its subsidiaries in the implementation, administration and management of the Plan. These recipients may be located in the Participant's country, or elsewhere, and the Participant's country may have different data privacy laws and protections than the recipients' country. Through acceptance of an Award, each Participant authorizes such recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Company or any of its subsidiaries or the Participant may elect to deposit any shares of Common Stock. The Data related to a Participant will be held only as long as is necessary to implement, administer, and manage the Participant's participation in the Plan. A Participant may, at any time, view the Data held by the Company with respect to such Participant, request additional information about the storage and processing of the Data with respect to such Participant, recommend any necessary corrections to the Data with respect to the Participant or refuse or withdraw the consents herein in writing, in any case without cost, by contacting his or her local human resources representative. The Company may cancel the Participant's ability to participate in the Plan and, in the Board's discretion, the Participant may forfeit any outstanding Awards if the Participant refuses or withdraws his or her consents as described herein. For more information on the consequences of refusal to consent or withdrawal of consent, Participants may contact their local human resources representative.

(i) *Governing Law.* The provisions of the Plan and all Awards made hereunder shall be governed by and interpreted in accordance with the laws of the State of Delaware, excluding choice-of-law principles of the law of such state that would require the application of the laws of a jurisdiction other than such state.

ribbon™

Form 10-K

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K/A
Amendment No. 1

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2018

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File Number 001-38267

RIBBON COMMUNICATIONS INC.
(Exact name of Registrant as specified in its charter)

DELAWARE	**82-1669692**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

4 Technology Park Drive, Westford, Massachusetts 01886
(Address of principal executive offices, including zip code)

(978) 614-8100
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, par value $0.0001	The Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☐ Accelerated filer ☒ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the common stock held by non-affiliates of Ribbon Communications Inc. was approximately $363,563,000 based on the closing price for its common stock on The Nasdaq Global Select Market on June 29, 2018. As of February 25, 2019, the Registrant had 107,270,854 shares of common stock, $0.0001 par value, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive Proxy Statement to be delivered to stockholders in connection with the Registrant's 2019 Annual Meeting of Stockholders are incorporated by reference into Part III of this report.

EXPLANATORY NOTE

Ribbon Communications Inc. (the "Company") filed its Annual Report on Form 10-K for the year ended December 31, 2018 (the "Original Filing") with the U.S. Securities and Exchange Commission (the "SEC") on March 4, 2019. The Company is filing this amendment (this “Amendment”) to the Original Filing due to an inadvertent omission of the conformed signature of Deloitte & Touche LLP on the Report of Independent Registered Public Accounting Firm related to its Opinion on the Financial Statements appearing in Item 8 of the Original Filing (the “Audit Report”). Accordingly, this Amendment amends the Original Filing to include the conformed signature to the Audit Report.

In addition, pursuant to the rules of the SEC, the exhibit list included in Item 15 of Part IV of the Original Filing has been amended to reference new certifications from the Company’s principal executive officer and principal financial officer, as required by Sections 302 and 906 of the Sarbanes-Oxley Act of 2002. The new certifications of the Company’s principal executive officer and principal financial officer are attached as exhibits to this Amendment.

Except as described above, this Amendment does not amend or update any other information contained in the Original Filing. This Amendment is presented as of the filing date of the Original Filing and does not reflect events occurring after that date. The Company has included a complete copy of the Original Filing, as amended per above, in this filing.

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RIBBON COMMUNICATIONS INC.
FORM 10-K
YEAR ENDED DECEMBER 31, 2018
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Cautionary Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which are subject to a number of risks and uncertainties. All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including statements regarding our future results of operations and financial position, anticipated restructuring and integration-related expenses, business strategy, plans and objectives of management for future operations and plans for future product development and manufacturing are forward-looking statements. Without limiting the foregoing, the words "anticipates", "believes", "could", "estimates", "expects", "intends", "may", "plans", "seeks" and other similar language, whether in the negative or affirmative, are intended to identify forward-looking statements, although not all forward looking statements contain these identifying words. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. We therefore caution you against relying on any of these forward-looking statements. Important factors that could cause actual results to differ materially from those in these forward-looking statements are discussed in Item 1A., "Risk Factors" of Part I and Items 7 and 7A., "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Quantitative and Qualitative Disclosures About Market Risk," respectively, of Part II of this Annual Report on Form 10-K. Also, any forward-looking statement made by us in this Annual Report on Form 10-K speaks only as of the date on which this Annual Report on Form 10-K was first filed. Factors or events that could cause our actual results to differ may emerge from time to time, and it is not possible for us to predict all of them. We undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.

Presentation of Information

Effective October 27, 2017, we completed the merger (the "Merger") of Sonus Networks, Inc. ("Sonus"), GENBAND Holdings Company, GENBAND, Inc. and GENBAND II, Inc. (collectively, "GENBAND").

Unless the context otherwise requires, references in this Annual Report on Form 10-K to "Ribbon," "Ribbon Communications," "Company," "we," "us" and "our" and "the Company" refer to (i) Sonus Networks, Inc. and its subsidiaries prior to the Merger and (ii) Ribbon Communications Inc. and its subsidiaries upon completion of the Merger, as applicable.

GLOSSARY OF CERTAIN INDUSTRY TERMS

The industry terms defined below are used throughout this Annual Report on Form 10-K for the year ended December 31, 2018 (this “10-K”).

API (*application programming interface*): A set of subroutine definitions, protocols, and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components.

Big Data: The use of data analytics and/or predictive analytics to extract value from large data sets. Analysis of large data sets may expose new correlations regarding business trends, infrastructure weaknesses and other related information.

CCaaS (Contact Center as a Service): A cloud-based delivery model that allows organizations to implement customer contact applications.

CPaaS (*Communications Platform as a Service*): A cloud-based delivery model that allows organizations to add real-time communication capabilities such as voice, video and messaging to business applications by deploying application program interfaces.

CPU (*central processing unit*): The electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output operations specified by the instructions.

Diameter: A next generation industry-standard protocol used to exchange authentication, authorization and accounting information in LTE and IMS networks.

DSC (*diameter signaling controller*): A device that helps communications service providers overcome Diameter signaling performance, scalability and interoperability challenges in LTE and IMS networks. Diameter is a next-generation industry-standard protocol used to exchange authentication, authorization and accounting information in LTE and IMS networks.

DSP (*digital signal processing*): The use of digital processing, such as by computers or more specialized digital signal processors, to perform a wide variety of signal processing operations. The signals processed in this manner are a sequence of numbers that represent samples of a continuous variable in a domain such as time, space, or frequency.

Edge: Appliances and/or software implemented on business customer premises that provides communications security and other capabilities for voice and data packet functions.

GPU (*graphical processing unit*): A specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display device.

HUC (*hosted unified communications*): A user-centric UC that supports traditional SIP-based endpoints as well as collaboration and video UC from PCs, Macs, and mobile devices.

IMS (*IP multimedia [sub]system*): An architectural framework for delivering IP multimedia services.

IP (*Internet Protocol*): A set of rules governing the format of data sent over the Internet or other network.

IP-PBX: SIP-based PBX.

ISP: Internet service provider.

LTE (*long term evolution*): A standard for high-speed wireless communication for mobile devices and data terminals for smooth and efficient transition toward more advanced leading-edge technologies to increase the capacity and speed of wireless data networks. Often used to refer to wireless broadband or mobile network technologies.

MSO (*multi-system operator*): An operator of multiple cable or direct-broadcast satellite television systems.

Network Edge Orchestration: Network Edge Orchestration uses intelligent edge solutions to monitor networks in real time, forwarding relevant information to a centralized management environment in the cloud. This model enables a service provider or an enterprise IT organization to proactively manage trends as well as react to issues or outages.

NFV (*network function virtualization*): A network architecture concept that uses the technologies of IT virtualization to virtualize entire classes of network node functions into building blocks that may connect, or chain together, to create communication services.

OTT (*Over-the-Top*): A media distribution practice that allows a streaming content provider to sell audio, video, and other media services directly to the consumer over the internet via streaming media as a standalone product, bypassing telecommunications, cable or broadcast television service providers that traditionally act as a controller or distributor of such content.

PBX (*private branch exchange*): A telephone system within an enterprise that switches calls between enterprise users on local lines while allowing all users to share a certain number of external phone lines.

PLMN (*public land mobile network*): A network that is established and operated by an administration or by a recognized operating agency for the specific purpose of providing land mobile telecommunications services to the public.

PSTN (*public switched telephone network*): The aggregate of the world's circuit-switched telephone networks that are operated by national, regional, or local telephony operators, providing infrastructure and services for public telecommunication.

RTC (*real-time communications*): A term used to refer to live telecommunications that occur without transmission delays. RTC is nearly instant with minimal latency. RTC data and messages are not stored between transmission and reception. RTC is generally a peer-to-peer, rather than broadcasting or multicasting, transmission.

SBC (*session border controller*): A device regularly deployed in VoIP networks to exert control over the signaling and the media streams involved in setting up, conducting, and tearing down telephone calls or other interactive media communications.

SDK: Software development kit.

SDN (*software-defined networking*): An umbrella term encompassing several kinds of network technology aimed at making the network as agile and flexible as the virtualized server and storage infrastructure of the modern data center.

SD-WAN (software-defined - wide area network): SD-WAN is a specific application of software-defined networking (SDN) technology applied to WAN connections such as broadband internet, 4G, LTE or MPLS. It connects enterprise networks including branch offices and data centers over large geographic distances.

SIP (*session initiation protocol*): A communications protocol for signaling and controlling multimedia communication sessions in applications of Internet telephony for voice and video calls, in private IP telephone systems, as well as in instant messaging over IP networks.

SMB: Small-medium business.

SMS (*short message service*): A text messaging service component of most telephone, World Wide Web, and mobile device systems, using standardized communication protocols to enable mobile devices to exchange short text messages.

SOHO: Small office and home office.

SSP: Standalone selling price.

STaaS (*SIP Trunking as a Service*): A VoIP technology and streaming media service based on SIP by which Internet telephony service providers deliver telephone services and UC to customers equipped with IP-PBX and UC facilities.

TDM (*time-division multiplexing*): A method of putting multiple data streams in a single signal by separating the signal into many segments, each having a very short duration. Each individual data stream is reassembled at the receiving end based on the timing.

TPE: Third-party evidence of selling price.

UC (*unified communications*): A business term describing the integration of enterprise communication services such as instant messaging (chat), presence information, voice (including IP telephony), mobility features (including extension mobility and single number reach), audio, web & video conferencing, fixed-mobile convergence, desktop sharing, data sharing (including web connected electronic interactive whiteboards), call control and speech recognition with non-real-time communication services such as unified messaging (integrated voicemail, e-mail, SMS and fax).

UCaas (unified communications as a service): The provision of business communications and phone system (PBX) services along with collaboration tools such as screen sharing and conferencing via a cloud-based pricing and delivery model.

VAR (*value added reseller*): A company that adds features or services to an existing product, then resells it (usually to end-users) as an integrated product or complete turn-key solution.

VMC (*virtualized mobile core*): A software platform enabling standard-based Wi-Fi Calling, LTE calling and VoLTE services for mobile network operators and mobile virtual network operators.

VNF (*virtual network function*): Responsible for handling specific network functions that run in one or more virtual machines on top of the appliance networking infrastructure, which can include routers, switches, servers, cloud computing systems and more.

VoIP (*Voice over Internet Protocol*): A methodology and group of technologies for the delivery of voice communications and multimedia sessions over IP networks, such as the Internet.

VoLTE (*Voice over LTE*): A standard for high-speed wireless communication for mobile phones and data terminals over a 4G LTE access network, rather than 2G or 3G connections.

VoWifi (*Voice over Wifi*): A complementary technology to VoLTE that utilizes IMS technology to provide the routing telephone calls and faxes over an existing data network rather than over the traditional PSTN.

VSOE (*vendor-specific objective evidence of selling price*): A method of revenue recognition allowed by U.S. GAAP that enables companies to recognize revenue on specific items on a multi-item sale based on evidence specific to a company that the product has been delivered.

Web-Scale: Historically, the term was associated with the massive cloud architectures developed by Facebook, Google and Amazon. The term has since evolved to reflect a company's adoption of private, efficient and scalable cloud environments that support flexibility, resiliency and on-demand infrastructure.

PART I

Item 1. Business

Overview

We are a leading provider of next generation ("NextGen") software solutions to telecommunications, wireless and cable service providers and enterprises across industry verticals. With over 1,000 customers around the globe, including some of the largest telecommunications service providers and enterprises in the world, we enable service providers and enterprises to modernize their communications networks through software and provide secure RTC solutions to their customers and employees. By securing and enabling reliable and scalable IP networks, we help service providers and enterprises adopt the next generation of software-based virtualized and cloud communications technologies for service providers to drive new, incremental revenue, while protecting their existing revenue streams. Our software solutions provide a secure way for our customers to connect and leverage multivendor, multiprotocol communications systems and applications across their networks and the cloud, around the world and in a rapidly changing ecosystem of IP-enabled devices, such as smartphones and tablets. In addition, our software solutions secure cloud-based delivery of UC solutions - both for service providers transforming to a cloud-based network and for enterprises using cloud-based UC. We sell our software solutions through both direct sales and indirect channels globally, leveraging the assistance of resellers, and we provide ongoing support to our customers through a global services team with experience in design, deployment and maintenance of some of the world's largest software IP networks.

We completed our acquisition of Edgewater Networks, Inc. ("Edgewater"), a market leader in Network Edge Orchestration for the distributed enterprise and UC market, in August 2018 (the "Edgewater Acquisition"), making us a software market leader in enterprise Session Border Controllers and allowing us to extend Edgewater software solutions internationally while expanding our cloud offerings and entering the SD-WAN market.

We completed our Merger with GENBAND, a global leader in NextGen software-enabled real-time communications solutions, in October 2017. Because of the Merger, we believe we improved our position to enable network transformations to IP and to cloud-based networks for service providers and enterprise customers worldwide, with a broader and deeper sales footprint, increased ability to invest in growth, more efficient and effective research and development, and a comprehensive RTC product offering.

Industry Background

Traditional TDM-based voice and data solutions are being supplanted by alternative NextGen IP-based networks and RTC software applications are being offered from the cloud in conjunction with the network and enterprise edge. Given this shift, today’s telecommunications service providers and enterprises are faced with two separate but related challenges: how to upgrade their aging and costly communications infrastructure, and how to implement new and innovative NextGen software, IP and cloud-based communications capabilities. Service providers in particular must address these challenges while at the same time responding to competition in the form of new web-scale communication providers, such as Microsoft Corp., Google LLC and Amazon.com, Inc.

To address these challenges, service providers and enterprises are modernizing their communications networks, network functions and communications applications from legacy environments to new environments using NextGen IP software, NFV, the cloud and the edge to take advantage of the many benefits that these technologies offer with an end goal of providing better and more productive communications experiences for their customers and employees.

Telecommunications Service Providers: Network Modernization

One of the most significant capital costs for telecommunications service providers has been and continues to be their infrastructure. In order to leverage past capital investments and deliver existing and new services, service providers must consolidate their infrastructure from costly, legacy infrastructures, such as the PSTN and the PLMN, into more efficient and flexible IP- and software-based network models, which are capable of driving revenue growth. Migrating from the PSTN to IP reduces real estate, power and operating costs. IP software networks allow the consolidation of voice, video and data within a single IP-based networking infrastructure over broadband and wireless access and enables new communications services, such as SIP Trunking and Hosted UCs. Similarly, modernizing mobile networks to the IMS-based 4G LTE and VoLTE networks enables mobile service providers to offer better and more efficient mobile communications experiences to end users. As consumers and businesses continue to demand more engaging and productive communications, we believe network modernization is and will continue to be essential to service providers' ability to compete effectively in the market for telecommunications services. As such, key market drivers include:

Modernization of Networks to IP

Communication trends have been shifting for the past several years. What was once an industry built on voice communications from central office switches and PBXs on the enterprise premise is now being replaced by the use of social networks, OTT service providers, mobile applications, and hosted service providers. Consumers are increasingly turning to OTT applications (i.e., WhatsApp, Apple's Facetime and iMessaging, or Amazon's Alexa). This shift has created an enhanced experience for consumers, heightened expectations for future products and services, and expanded related addressable markets.

Network modernization to IP NextGen software-based systems enables service providers to add modern communications service offers that blend traditional voice messaging capabilities with contemporary features, such as video messaging, visual voicemail, mobile messaging and e-mail integration, and an accelerated time-to-market for differentiated messaging services. Network infrastructures are also undergoing a transformation to IP and the cloud, migrating from hardware-centric appliances to software solutions for voice interconnect and wide area networking.

Enterprises, large and small, are re-architecting business processes and undergoing a digital transformation, building their own virtualized software solutions in the cloud or moving their IT applications entirely to public cloud applications, and adding RTC and collaboration to their customer service solutions. These new offerings improve customer service and create an e-commerce experience that blends online applications with the in-store environment, creating a seamless experience for customers.

As a result of these evolving communications environments, the complexity of network operations is also increasing significantly, requiring sophisticated NextGen software solutions based on machine learning and analytics to provide reliable network operations.

Secure Real-time Communications

The evolution by telecommunications service providers to IP NextGen software-based RTC exposes them to new security threats, as the "walled" protection offered by their voice network infrastructures no longer exists with SIP and data-based networks. With SIP-based systems, RTC applications such as voice, video and messaging become data applications, and without appropriate security measures in place, these networks are left open to security breaches and hacks. Additionally, the move to SIP has seen an increase in fraud in service provider networks in the form of robo-dialing and toll fraud schemes.

Given these threats, there is a need for sophisticated software security solutions to protect IP-based communications networks. Service providers have relied upon the software capabilities of SBCs, which are deployed within their networks and are designed to provide robust security as well as simplify interoperability, routing and other functions as a protection measure. By its nature, the SBC controlling software is application-aware and therefore can provide sophisticated data to software-based analytics platforms to detect and thwart security breaches. In conjunction with SBCs, big data analytics and machine learning solutions can enforce a network-wide security perimeter. We believe securing networks against threats is most effective when secure software solutions are deployed within networks into existing RTC investments and combined with network-wide approaches for secure RTC.

Edge Orchestration

As service providers deliver Hosted and Cloud UC services to enterprises, they need to be able to provide those services to the enterprise via the internet and IP infrastructure and must do so with service assurance, security and reliability in a cost-effective manner. Hybrid cloud and edge orchestration software offerings enable service providers to manage enterprise edge devices remotely from their cloud or network and provide the service in a cost-effective and reliable manner. Such solutions minimize service downtime and expensive visits to enterprise customer sites via truck rolls to work on the edge devices on the enterprise customer premise.

Network Function Virtualization

In addition to shifting from traditional TDM-based voice and data networks to secure IP NextGen software networks, telecommunications service providers are increasingly moving toward NFV in order to offer new services quickly to their customers, reduce costs and compete with Web-Scale companies. NFV provides a new way to design, deploy and manage networking services by decoupling network software functions from proprietary appliances so they may run in software. This

transformation enables better use of network infrastructure, creates agility, delivers rapid and elastic scaling, and enables faster time to market. Software-enabled VNFs can be deployed on generic computing platforms, hosted in private and public clouds, located in data centers, within other network elements or on computer platforms on end user premises.

Cloud and "as a Service" Models

As software communications applications are deployed in the cloud, telecommunications service providers gain the ability to offer a new class of business models commonly referred to "as a Service" solutions. These offerings include:

CPaaS: CPaaS is a cloud-based software platform that enables developers to add RTC features, such as voice, data, video, and messaging, in their own applications without requiring backend infrastructure and interfaces. CPaaS provides software developers the flexibility to "drag and drop" these features into their native applications or within web sites through simple APIs and SDKs. With CPaaS, enterprises can quickly build applications that tie RTC and their social channels to their business workflows and customer engagements. This software technology has not only moved real time communications off service provider networks, but also has greatly simplified the development and deployment of RTC capabilities.

UCaaS: Deploying NextGen UC software within the cloud helps enterprises provide flexibility and scalability for core business tasks. UCaaS features include enterprise messaging, presence technology, online meetings, team collaboration, telephony and video conferencing in lieu of traditional voice solutions, such as PBXs or carrier-based Centrex. UCaaS is also another offering for improving customer engagements and experiences.

STaaS: SIP software trunking enables service providers to bundle voice and data over a single converged IP connection and brings converged connectivity to the enterprise, creating a more economical offering than can be achieved with separate voice and data connections. STaaS delivers NextGen IP software connectivity to customers equipped with IP-PBX and UC facilities. With STaaS, customers have the flexibility to manage their own SIP trunks through simple and reliable software interfaces.

Enterprises: Network Modernization and Digital Transformation

Today's enterprises, including multi-national corporations, SMBs and government institutions, are undergoing not only a network modernization but also a digital business transformation. The focus is shifting from person-to-person communications to contextual collaboration and omni-channel customer experiences. Within this context, enterprises need a secure, scalable and innovative NextGen software alternative to proprietary PBX and UC products. As part of their digital transformation, enterprises have adopted the cloud, open interfaces, mobile, Big Data, and analytics. Seeing the advantages and cost savings from the cloud, enterprises are migrating their communications solutions to this same environment, thereby enabling connections between business processes, communications, and collaboration.

Network Modernization

Enterprises undergoing network modernization are focused on moving from TDM-based PBXs to SIP trunking and NextGen UC software and collaboration systems while ensuring interoperability during the transformation process. In addition, enterprises in certain industries will often be subject to specific requirements or standards before a network transformation is completed. For example, governments may require Joint Interoperability Test Command ("JITC") certification for secure deployments, and healthcare providers may need to achieve HIPAA certification.

When modernizing a network with software, the ability to interwork modern applications, such as Microsoft's Skype for Business, with legacy analog endpoints on premises becomes essential. Additionally, software capabilities of SBCs are vital in providing interworking and survivability options. SBCs play a crucial role in securing the modern network and for NextGen UC software, which is a top priority for any enterprise. Edge SBC software devices can also play an important role in providing SD-WAN capabilities for small and distributed enterprises. Due to the growing open nature of communications environments in the enterprise, the complexity of network operations is also increasing significantly, requiring sophisticated software solutions based on machine learning and analytics to provide reliable network operations.

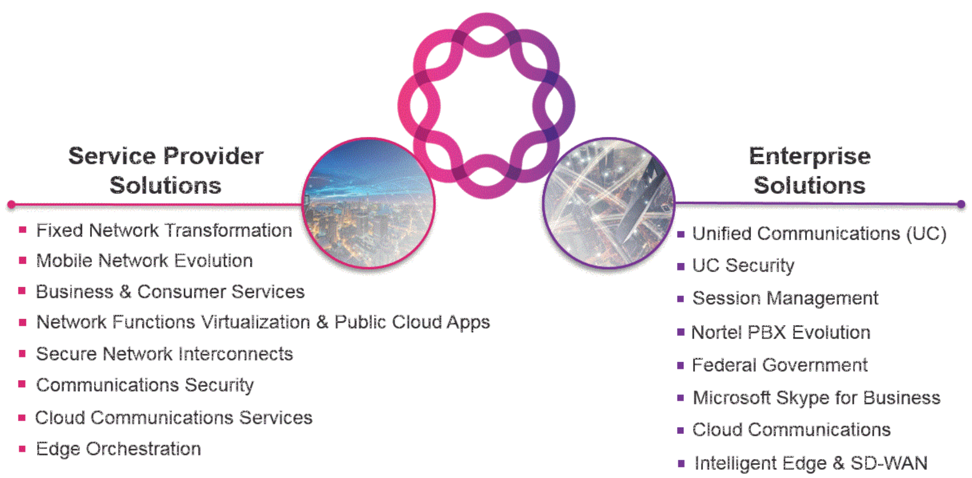
Digital Transformation

Successful enterprises today are focused on innovating their core product offerings and building a strategic advantage to reach and empower their customers. As technologies evolve and new mobile applications and connected devices proliferate, enterprises must adapt and innovate their communications solutions to create a "connected" experience anywhere, anytime, on any device. As part of this process, businesses are increasingly deploying "as a Service" offerings from the cloud (from either a service provider or a web-scale provider). UCaaS and CPaaS create a single software communications platform that changes the way enterprises deliver services and interact with customers. CPaaS software enables enterprises to quickly build applications that tie real time communications and their social channels to their business processes while UCaaS software delivers the underlying UC capabilities to ensure end users have the features and functionality required to enable reliable and scalable end-to-end communications.

Our Solutions, Products and Services

Ribbon Solutions

Ribbon provides secure NextGen RTC software-enabled appliances and cloud solutions for service providers and enterprises. Ribbon's software communications solutions are widely deployed at over 1,000 customers globally; provide high scale, reliability and performance; and are deployable from the public, private and hybrid cloud, in-network or on the enterprise premise and edge. As of December 31, 2018, our software solutions, which are a combination of our software products and services, for service providers and enterprises included the following:



Ribbon service provider software solutions enable fixed and wireless service providers, cable providers (or MSOs), ISPs and interconnect service providers to modernize their networks, quickly capitalize on growing market segments and introduce differentiating products, applications and services for their business and consumer customers. Ribbon's service provider network modernization software solutions include fixed network transformation, wireless network evolution (mobility), secure network interconnects, network functions virtualization, cloud communications as a Service, and communications security and edge orchestration solutions, enabling secure and innovative business and consumer communications services offerings. Ribbon software solutions help service providers connect people to each other wherever they happen to be, addressing the growing demands of today’s consumers and businesses for secure RTC.

Ribbon's enterprise software solutions allow enterprises to securely connect to SIP trunks and modernize their unified and cloud communications networks. Modernization solutions range from Intelligent Edge, legacy Nortel PBX evolution, securing UC and contact centers, migrating to Microsoft Skype for Business and Teams with Direct Routing, and providing session management, security and cloud communications software solutions to enable highly productive communications experiences for employees and customers using the web, mobile and fixed endpoints. Ribbon provides secure communications software solutions for the federal government vertical and has JITC certified solutions. Ribbon also provides RTC software solutions to other industry verticals, including higher education, finance and healthcare. Ribbon has significant experience and expertise in securing SIP communications with a portfolio of SBC software solutions and has deployed thousands of SBC software installations across different industry verticals. Our Intelligent Edge software solutions simplify UC deployments and enable SD-WAN for small and distributed enterprises. Our Microsoft Skype for Business and Teams software solutions secure those communications environments and assist in the migration of enterprise customers to those environments.

Ribbon Products

Ribbon software products enable service providers to take new services to market quickly and with scale and carrier class reliability, allowing such providers to compete effectively in the marketplace, and enable enterprises to make their employee and customer engagement experiences richer and more productive.

Ribbon’s software product lines enabling network transformation, mobile network evolution and interconnect solutions include Ribbon's call session controllers, media gateways, signaling, policy and routing software and a market leading portfolio of SBCs intelligent edge software products, all of which are mechanisms through which operators and enterprises deploy our secure RTC software solutions. Ribbon’s NextGen UC software solutions are enabled by the Ribbon Application Server, Client and Intelligent Messaging products, and are a software platform for business and residential multimedia communications across fixed, mobile, cable, and enterprise markets. Our software product portfolio facilitates the securing of SIP-based UC sessions in the enterprise core and edge networks, and the migration of legacy PBX-based enterprise communications networks (such as the Nortel PBX installed base) across different market verticals. Our software product portfolio includes element management and network management software to enable customers to configure, monitor and manage the solutions they purchase from us.

The software product portfolio also includes native mobile client products that allow service providers to enable Wi-Fi and LTE Calling services for their subscribers without the considerable cost of investing in, implementing and maintaining, a full VoLTE IMS network.

The Company's Cloud Communications “as a Service” portfolio, which includes CPaaS, UCaaS and STaaS offerings, is based on Kandy Cloud, which is a cloud-based RTC software platform that enables service providers, independent software vendors, systems integrators and enterprises to rapidly create and deploy high value embedded communications services for their customers. Utilizing Ribbon's communications technology, which is offered as a part of a white-label solution service, service providers may connect their networks to Kandy Cloud CPaaS via SIP trunks and APIs. The Kandy Cloud software platform provides APIs and SDKs for developers to build embedded communications applications. Kandy Cloud helps service providers grow revenue with quick to deploy, pre-packaged applications called Kandy Wrappers. Kandy Wrappers are fully functional software applications that can be delivered standalone or inserted into an enterprise website or into an enterprise application to endow it with embedded RTC capabilities. Kandy Cloud also delivers a suite of UCaaS solutions, such as Cloud PBX, Cloud Contact Center and Cloud Collaboration.

Ribbon Global Services

Our global services organization is responsible for all aspects of implementation and support of our solutions and products. Key portfolio components include solution and business consulting, system integration, deployment, and managed care services. Our technical support group provides constant support to keep customers' software operating at peak performance. Support services include managing software updates, appliance maintenance, appliance spare services and managed spares programs, and emergency assistance during disaster recovery.

With a local presence in over twenty countries on five continents, Ribbon Global Services provides both a U.S. presence and a global presence with complete coverage to help drive our customers’ success.

The Ribbon Global Services team provides our customers with the following:

A full-service portfolio including deployment and integration, testing and verification, migration, operational support, monitoring and managed services;

End-to-end project management and accountability via highly experienced program managers who follow a consistent, disciplined methodology;

Knowledgeable and experienced technical resources with in-depth skills and expertise on IP communications software solutions and network modernization;

Consistent execution in the design, deployment and support of the world's largest and most advanced software networks; and

Award winning, around-the-clock technical support services with dedicated technical support centers around the globe, including the United States, Canada, Mexico, United Kingdom, Spain, Germany, Czech Republic, Australia, Japan, Malaysia, Taiwan, China (Hong Kong) and India.

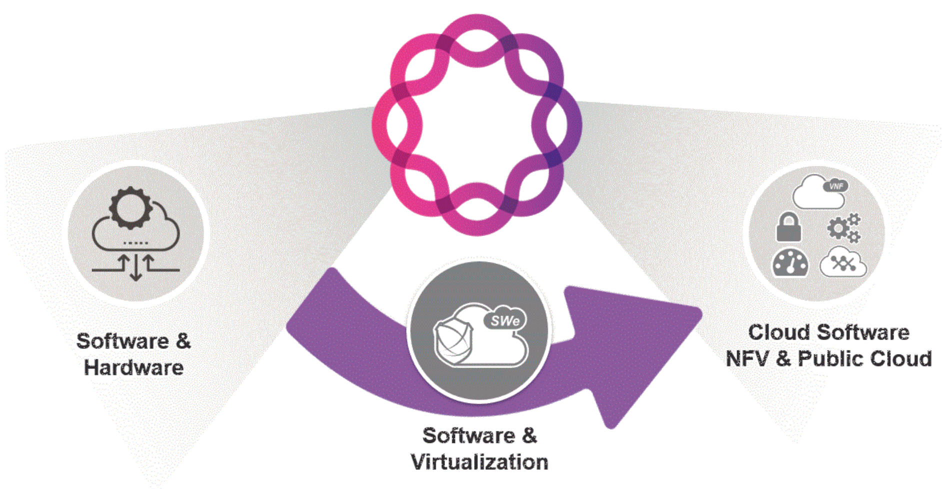
Our Strategy

Ribbon is a leader in enabling network modernization through NextGen software and we plan to continue to invest in our software solutions platform approach to increase our global reach and scale. We aim to enable service providers and enterprises to significantly expand their software-enabled RTC environments to provide better, more agile end customer experiences that contain their operational and capital expenditure costs. By doing so, we believe we will sustain our industry-leading position and succeed in our market. Our customers are key to the success of our business and our business model is focused on aligning with our customers through direct engagement, service and support as well as through our channel partners. This model allows us to target our sales and research and software development efforts based on the needs of our customers and we believe it is critical to our success.

Key elements of Ribbon's strategy include:

Selectively Invest in our Core Software Products and Solutions. In order to service our customers and support their key priorities and growth, we must strategically invest in research and development. We are committed to balancing our research and software development investments between existing software products and solutions and new growth-oriented product initiatives. In 2018, greater than 95% of our research and development investment was directed at software. In addition, we are focused on investing in products and solutions that will be profitable. We intend to continue to sunset certain less significant product offerings that are not aligned with our strategic direction and are not meaningful contributors to our profitability. We believe this will allow us to more effectively and efficiently deploy capital to our growth areas. Through targeted research and software development investments in core software products and solutions that will align with our strategy for growth, we are committed to helping our customers migrate their networks to software and virtualized and cloud environments.

Build on Growing our Customer Footprint and Global Reach. Ribbon has over 1,000 customers globally, in all of the major regions with many of the largest telecommunications service providers and enterprises in the world. This footprint allows us to sell additional software products and services from the Ribbon portfolio to that deployed base of existing customers and provides us with the opportunity to sell new software products and services to that customer base. We also continue to look for opportunities to expand our portfolio footprint and global reach to further diversify our customer base.



Disciplined Expansion into New Markets and New Solutions for Growth. We believe that a disciplined approach to targeting new markets is critical to growing our business. As such, we have taken actions to expand our software portfolio and offerings to our customers. We have expanded our investments in the enterprise market and have increased our revenue from enterprise customers. We are investing in growth initiatives focused on cloud communications and RTC security both for service providers and enterprises. Similarly, given our significant experience with securing IP network borders in the core and the edge with our SBC software, and the increasing importance of security in today's networks and communications, we are working on expanding our role in securing RTC with new software portfolio offerings.

Selectively Pursue Strategic Relationships, Alliances and Acquisitions. The ecosystem in which we operate is continually evolving and expanding. Accordingly, we continue to pursue strategic relationships, alliances and acquisitions that align our business with our customers' strategic goals and objectives as well as our own strategic goals for further extending our footprint, reach, scale and growth in the business.

Competitive Differentiation

In addition to our scale and global presence, we believe there are several factors that set us apart and allow us to compete effectively with comparable peers in terms of scope, size and scale.

Installed Base. Ribbon has a large, global deployed base of Nortel-, Sonus- and GENBAND-branded software products, including softswitches and media gateways in global service provider and enterprise networks supporting over 30 million switched access lines. These products are highly integrated into our customers' network environments and require specialized tools and intellectual property from Ribbon to consolidate and modernize those environments to newer IP software-based services with optimal capital expenditure investments. Similarly, our large, global deployed base of SBCs at service providers' networks and in enterprises offers Ribbon a unique platform for upgrading and cross-selling software products into that installed base.

Strong Technology in Virtualization. Ribbon has extensive network virtualization software products and technology as part of our overall portfolio and have deployed these software products to help our customers in the modernization of their networks to software-based virtualization and the cloud. A significant portion of our overall portfolio has software and virtualized offerings that can co-exist with appliance-based software products.

Security Experience and Technology. Our SBC and edge software, deployments and expertise are market leading. Ribbon has been in the SBC software market for over fifteen years, yielding us a strong advantage from which to launch additional security offerings into the market. We believe our SBC software products are unmatched in the market on reliability, performance and functionality at scale.

Media Processing, Transcoding and Signaling Technology Expertise. We have extensive experience in deploying mobile VoLTE and fixed network software solutions. Our voice media transcoding software technology that is supported by CPU, GPU or DSP options is industry leading. Our mobile network evolution software solutions are deployed in large-scale 4G VoLTE networks supporting over 250 million subscribers in total.

Intellectual Property

Intellectual property is fundamental to our business and our success, and we depend upon our ability to develop, maintain and protect our technology. We have defended, and intend to vigorously defend when necessary, our intellectual property from infringement. Therefore, we seek to safeguard our investments in technology and rely on a combination of United States and foreign patent, trademark, trade secret and copyright law and contractual restrictions to protect the proprietary aspects of our technology and to defend us against claims from others. Our general policy has been to seek to patent those patentable inventions that we plan to incorporate in our products or that we expect will be valuable otherwise. We have a program to file applications for and obtain patents, copyrights and trademarks in the United States and in specific foreign countries where we believe filing for such protection is appropriate.

As of December 31, 2018, we held patents and had pending patent applications both in the United States and abroad as follows: in the name of Sonus Networks, Inc., 239 United States patents with expiration dates ranging from May 2019 through May 2037, 33 patent applications pending in the United States, 50 foreign patents with expiration dates ranging from May 2020 through April 2030, and one patent application pending abroad; in the name of GENBAND US LLC, 326 United States patents with expiration dates ranging from June 2019 through April 2037, 59 patent applications pending in the United States, 219 foreign patents with expiration dates ranging from October 2019 through April 2035, and 51 patent applications pending abroad; and in the name of Edgewater Networks, Inc., six United States patents with expiration dates ranging from October 2022 through March 2035 and six patent applications pending in the United States.

Furthermore, as of December 31, 2018, we had 37 registered trademarks in the United States, as follows: 19 in the name of GENBAND US LLC, including GENBAND, GENBAND with design, G9, G9 with design, KANDY and BUSINESSCALL; 12 in the name of Sonus Networks, Inc., including SONUS, the SONUS logo and NETSCORE; two in the name of Network Equipment Technologies, Inc., including NET (and design); four in the name of Quintum Technologies, LLC, including TENOR; and five in the name of Edgewater Networks, including Edgewater and Edgeview. We also had 28 pending trademark applications in the United States in the name of Sonus Networks, Inc., including Ribbon and the Ribbon Logo as of December 31, 2018.

In addition to the protections described above, we seek to safeguard our intellectual property by:

Employing measures to safeguard against the unauthorized use or disclosure of the source and object code for our software, documentation and other written materials, and seeking protection of such materials under copyright and trade secret laws;

Licensing our software pursuant to signed license agreements, which impose restrictions on others' ability to use our software; and

Seeking to limit disclosure of our intellectual property by requiring employees and consultants with access to our proprietary information to execute confidentiality agreements.

We have incorporated third-party licensed technology into certain of our current products. From time to time, we may be required to license additional technology from third parties to develop new products or to enhance existing products. Based on experience and standard industry practice, we believe that licenses to use third-party technology generally can be obtained on commercially reasonable terms. Nonetheless, there can be no assurance that necessary third-party licenses will be available or continue to be available to us on commercially reasonable terms. As a result, the inability to maintain, license or re-license any third-party licenses required in our current products, or to obtain any new third-party licenses to develop new products and enhance existing products could require us to obtain substitute technology of lower quality or performance standards or at greater cost. This could delay or prevent us from making these products or enhancements, any of which could seriously harm our business, financial condition and operating results.

Please see generally the risks that are discussed in Item 1A. “Risk Factors” for risks related to our intellectual property.

Our Customers

We have over 1,000 customers globally. Our customers are located around the world in over 50 countries and include many of the leading global telecommunications service providers and enterprises. Service providers use our products to provide secure software-enabled RTC for the service providers (in the case of interconnects), enterprises and consumers they serve. Enterprises use our products to provide software-enabled RTC for their employees (including remote workers) as well as provide secure communications networks for their customer-facing components, such as contact centers.

Our global service provider customers include fixed-line, wireless, cable, internet and interconnect service providers. Our enterprise customers include businesses of all sizes, ranging from SOHO, SMB, and large and distributed enterprises across various industry verticals with a concentration in the federal government, healthcare and education sectors. We sell to customers via a direct sales team as well as through indirect channels that include VARs, system integrators and service providers. Independent software vendors also partner with Ribbon to source our software solutions and market them through their sales channels.

In both the years ended December 31, 2018 and 2017, approximately 17% of our revenue was derived from sales to one customer, Verizon Communications Inc., a service provider that provides interconnect, fixed line and mobile communications services. Verizon is transforming its TDM network from an appliance-centric network to a SIP and NFV based network, and Ribbon is playing a key role in this transformation. Our top five customers represented approximately 38% of our revenue in the year ended December 31, 2018 and approximately 41% of our revenue in the year ended December 31, 2017.

Competitive Conditions

Competition in the telecommunications market remains fierce. The market is shifting from a market dominated by a few large telecommunications legacy hardware equipment companies, such as Ericsson LM Telephone Company, Huawei Technologies Co. Ltd., and Nokia Corporation, to a market that is characterized by software, including network virtualization, migration to the cloud, and open interfaces. We believe this shift creates opportunities for us as well as our direct competitors in telecommunications and networking, including:

Network transformation: Mid-size vendors of networking and telecommunications equipment and specialty vendors, including AudioCodes Ltd., Dialogic Inc., Mavenir Systems, Inc., Metaswitch Networks Corporation, Oracle Corporation (Session Border Controller) and ADTRAN, Inc.;

Enterprise and cloud solutions: Microsoft, 8x8, Inc., Avaya Inc., Bandwidth Inc., Cisco Inc. (with Broadsoft, Inc.), Mitel Networks Corporation (with ShoreTel, Inc.), Plivo Inc., RingCentral, Inc., Twilio Inc., Telestax Inc., Fuze, Inc., Genesys and Vonage Holdings Corp. (with Nexmo, Inc. and Tokbox Inc.); and

Security and analytics: SecureLogix Corporation, RedShift Networks Corporation, Empirix Inc. and Oracle Corporation.

Other smaller private and public companies are also focusing on similar market opportunities. Mergers among any of the above companies or other competitors, as well as additional competitors with significant financial resources entering our markets, could further intensify competition. Mergers between service providers may also increase competition, as these reduce the number of customers and channels for products and solutions.

To compete effectively, we must deliver innovative software solutions that provide extremely high reliability and quality; deploy and scale easily and efficiently; interoperate with existing network infrastructures and multivendor solutions; provide effective network management; are accompanied by comprehensive customer support and professional services; provide a cost-effective and space-efficient solution for enterprises and service providers; meet price competition from low cost equipment providers; and offer solutions that are timely for the market and support where the industry is heading.

Although we believe we compete favorably because our software solutions are widely deployed, highly scalable and cost-effective for our customers, some of our competitors include products in their portfolios that we do not provide and may be able to devote greater resources to the development, promotion, sale and support of their products. In addition, some of our competitors have more extensive customer bases and broader customer relationships than we have, including relationships with our potential customers and established relationships with distribution partners.

Please see generally the risks that are discussed in Item 1A, "Risk Factors" for risks related to our customers and the competitive landscape in which we operate.

Sales and Marketing

We sell our software products, solutions and services to our customers with a direct internal sales force and also indirectly via channels and partnerships globally, leveraging the assistance of service provider channels and VARs such as Verizon Communications Inc. and Hawaiian Telecom, and distributors such as Westcon Group Inc., Ingram Micro, BlackBox and Arrow S3. Our channel partner programs are designed to serve particular markets and provide our customers with opportunities to purchase our products in combination with related services and products. For example, Ribbon is a Microsoft Gold Communications Partner and helps enterprises optimize Skype for Business (and Teams) deployments by securing those communications.

As a primary supplier of software solutions to Tier 1 service providers (a service provider that can reach every other network on the Internet without purchasing IP transit), we require a strong worldwide presence. We have an established sales presence throughout North America, Europe, Asia/Pacific, the Middle East, Africa and Central/South America. We also have a dedicated direct sales team focused on the enterprise, industry verticals and federal government sector in the United States.

Our marketing team is focused on promoting company brand awareness, increasing our software solutions, product, technology and services differentiation and awareness via webinars, company web sites, advertising and digital outreach, as well as generating qualified sales leads. We promote thought leadership on technology and our solutions within the industry by participating in and speaking at industry events and conferences and via social network campaigns and blogs. Our marketing team also provides briefings to industry analysts on a regular basis and at major industry events, communicates with the media in connection with noteworthy public announcements and supports our investor relations department on quarterly conference calls and regular investor updates.

Please see generally the risks that are discussed in Item 1A. "Risk Factors" for risks related to our sales strategy.

Manufacturing

A number of our software products are deployed on appliances. Where our products contain an appliance element, we utilize contract manufacturers to source and assemble these components. Our contract manufacturers provide comprehensive manufacturing services, including assembly and testing of our products and procurement of component materials on our behalf. We believe that outsourcing the manufacturing of any necessary appliance enables us to preserve working capital, allows for greater flexibility in meeting changes in demand and enables us to be more responsive in delivering diverse product offerings to our customers. As of December 31, 2018, we outsourced the manufacturing of our appliance products to four manufacturers, two upon which we primarily rely. However, we are currently in the process of transitioning our manufacturing to a single contract manufacturer. We and our contract manufacturers purchase several key components of our appliance products, including commercial digital signal processors, from single or limited sources. We purchase these components on a purchase order basis.

Our purchases of direct materials and components for manufacture of approximately $75 million in 2018 (approximately $64 million excluding the effects of the Edgewater Acquisition) increased compared with approximately $38 million in 2017 due to the inclusion of the GENBAND business since October 27, 2017 and Edgewater business since August 3, 2018 in our consolidated results. Going forward, we expect our overall trend of a reduction in direct material purchases to continue as the software richness within our products increases while the remaining appliance content declines.

Please see generally the risks that are discussed in Item 1A. "Risk Factors" for risks related to our manufacturing operations and use of contract manufacturers.

Research and Development

We believe that strong software product development capabilities are essential to our strategy of enhancing our core technology, developing additional security and network modernization features and maintaining comprehensive software and service offerings. Our research and development process leverages innovative technology in response to market data and customer feedback. As part of this process, we regularly review research and software development investments in our products and balance them against market demand.

We have assembled a team of highly skilled engineers with significant transcoding, UC application and networking industry experience. Our engineers have deep experience in software design and development. Our engineering effort is focused on NextGen UC, NFV, security and cloud-based architecture software product development.

As of December 31, 2018, we maintained research and development offices in Massachusetts, California, Illinois, Texas, New Jersey and North Carolina in the United States, as well as Canada, India and the United Kingdom.

Seasonality

We have experienced quarterly fluctuations in customer activity due to seasonal considerations. We typically experience increases in order volume in the fourth quarter due to greater spending on operating and capital expenditures by our service provider customers. We typically experience reductions in order volume toward the beginning of the calendar year, when our service provider customers are finalizing their annual budgets, which may result in lower revenue in the first quarter. These seasonal effects may vary and do not always correlate to our operating results. Accordingly, they should not be considered a reliable indicator of our future operating results.

Backlog

We sell products and services pursuant to purchase orders issued under master agreements that provide standard terms and conditions that govern the general commercial terms and conditions of the sale. These agreements typically do not obligate customers to purchase any minimum or guaranteed quantities, nor do they generally require upfront cash deposits. At any given time, we have orders for products that have not yet been shipped and for services (including our customer support obligations) that have not yet been performed. We also have orders relating to products that have been delivered and services that have been performed but have not yet been accepted by the customer under the applicable purchase terms. We include both of these situations in our calculation of backlog.

A backlogged order may not result in revenue in the quarter in which it was booked, and the actual revenue recognized in a quarter may not equal the total amount of related backlog. In addition, although we believe that the backlog orders are firm, purchase orders may be canceled by the customer prior to shipment without significant penalty. Therefore, we do not believe that our backlog, as of any particular date, is necessarily indicative of actual revenue for any future period.

We have begun to derive, and expect to continue to derive, a greater percentage of our revenue from the enterprise market and through sales channels where speed of fulfillment is essential to winning business. Consequently, we expect to earn a lower relative percentage of our total business from large service provider orders that are delivered over multiple quarters and years and that our backlog going forward will diminish both as a comparable metric to prior periods and as a relative percentage of total revenue (both service provider and enterprise). Our backlog was approximately $340 million at December 31, 2018 and approximately $370 million at December 31, 2017. Our prior period amount has been conformed to our current period presentation following the adoption of Accounting Standards Codification 606, *Revenue from Contracts with Customers* and no longer includes purchase orders where product delivery is not expected within twelve months.

Our Employees

At December 31, 2018, we had a total of 2,245 employees, comprised of 1,386 employees located in the Americas, 257 employees located in the Middle East, Africa and Europe and 602 employees located in the Asia Pacific region. Certain of our employees are represented by collective bargaining agreements, primarily in Europe. We believe our relationships with our employees are good.

Segment Information

We operate in a single segment. Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker in making decisions regarding resource allocation and assessing performance. To date, our chief operating decision maker has made such decisions and assessed performance at the company level, as one segment. Our chief operating decision maker is our President and Chief Executive Officer.

Our Company History

We were organized as a Delaware corporation on May 19, 2017, initially under the name Solstice Sapphire Investments, Inc., for the purpose of effecting the merger of Sonus and GENBAND. The Merger occurred on October 27, 2017. Upon completion of the Merger, Sonus and GENBAND became wholly-owned subsidiaries of Solstice Sapphire Investments, Inc., which concurrently changed its name to Sonus Networks, Inc. On November 28, 2017, Sonus Networks, Inc. changed its name to Ribbon Communications Inc. Ribbon succeeded to and continues to operate, directly or indirectly, the then existing businesses of Sonus and GENBAND.

Additional Information

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed with or furnished to the United States Securities and Exchange Commission (the "SEC"), are available free of charge through the SEC's Internet site (*http://www.sec.gov*) or our Internet site (*http://www.ribboncommunications.com*) as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

Item 1A. Risk Factors

Our business faces significant risks and uncertainties. Certain important factors may have a material adverse effect on our business prospects, financial condition and results of operations, and they should be carefully considered. Accordingly, in evaluating our business, we encourage you to consider the following discussion of risk factors in its entirety in addition to other information contained in or incorporated by reference into this Annual Report on Form 10-K and our other public filings with the Securities and Exchange Commission ("SEC"). Other events that we do not currently anticipate or that we currently deem immaterial may also affect our business, prospects, financial condition and results of operations.

Risks Related to the Sonus-GENBAND Merger

While we continue to integrate any remaining separate processes, policies, procedures, operations, technologies and systems, it is possible that such remaining integration activities may not be successful, and therefore, any remaining anticipated benefits and cost savings of the Sonus-GENBAND merger may not be realized, which could have a material adverse effect on our results of operations and financial condition.

Effective October 27, 2017, we completed the merger (the "Merger") of Sonus Networks, Inc. ("Sonus"), GENBAND Holdings Company, GENBAND, Inc., and GENBAND II, Inc. (collectively, "GENBAND").

While we continue to integrate any remaining separate processes, policies, procedures, operations, technologies and systems, it is possible that the integration process could still result in the loss of key employees, higher than expected costs, diversion of management attention, the disruption of our ongoing businesses or inconsistencies in standards, controls, procedures and policies that adversely affect the combined company's ability to maintain relationships with customers, vendors and employees or to achieve the anticipated benefits and cost savings of the Merger. If we experience difficulties with the integration process or are unable to successfully combine the businesses of Sonus and GENBAND in an efficient and effective manner, the anticipated benefits and cost savings of the Merger may not be realized fully or at all, or may take longer to realize than anticipated. An inability to realize the full extent of the anticipated benefits of the Merger, as well as any delays encountered in the integration process, could have an adverse effect upon our revenue, level of expenses and operating results, which may adversely affect the value of our common stock.

In addition, Sonus and GENBAND incurred, and we expect to continue to incur, significant costs in connection with integrating the operations of the two companies. These include implementing integration plans, including facilities and systems consolidation costs and employment-related costs. We may incur additional and unforeseen expenses during the integration process. Payment of these costs and expenses may adversely affect our liquidity, and the actual cost savings of the Merger could be less than expected and may take longer to achieve than anticipated or may not be realized at all.

We entered into a stockholders' agreement with certain GENBAND stockholders in connection with the consummation of the Merger, which provided them with certain rights that may differ from the rights of our other stockholders. Such GENBAND stockholders may decide to sell their shares in bulk or from time to time, which timing we cannot control.

On October 27, 2017, in connection with the consummation of the Merger, we entered into a principal stockholders' agreement (the "Stockholders Agreement") with Heritage PE (OEP) II, L.P. and Heritage PE (OEP) III, L.P. (collectively with any successor entities, the "OEP Stockholders"), principal stockholders of GENBAND prior to the Merger. The Stockholders Agreement sets forth certain arrangements and contains various provisions relating to board representation, standstill restrictions and transfer restrictions as further described therein, including the right of the OEP Stockholders to designate up to five directors for nomination to our nine-member board of directors, subject to the OEP Stockholders maintaining certain levels of beneficial ownership of our common stock. Therefore, the OEP Stockholders will be able to exert significant influence over matters requiring board approval, and our stockholders other than the OEP Stockholders will have limited or no ability to influence the outcome of certain key transactions. The interests of the parties to the Stockholders Agreement may differ from those of other holders of our common stock.

The OEP Stockholders own 46.7% of our common stock as of January 31, 2019, and may decide to sell their shares in bulk or from time to time, which timing we cannot control. The sale of their shares may increase the volatility of our stock price, and our stock price could decline as a result.

Risks Related to our Business and Industry

Our quarterly revenue and operating results are unpredictable and may fluctuate significantly from quarter to quarter, which could adversely affect our business, results of operations and the trading price of our common stock.

Our revenue and operating results may vary significantly from quarter to quarter due to a number of factors, many of which are outside of our control and any of which may cause our stock price to fluctuate. The primary factors that may affect our revenue and operating results include, but are not limited to, the following:

- consolidation within the telecommunications industry, including acquisitions of or by our customers;
- general economic conditions in our markets, both domestic and international, as well as the level of discretionary IT spending;
- competitive conditions in our markets, including the effects of new entrants, consolidation, technological innovation and substantial price discounting;
- fluctuation in demand for our products and services, and the timing and size of customer orders;
- fluctuations in foreign exchange rates;
- cancellation or deferral of existing customer orders or the renegotiation of existing contractual commitments;
- mix of product configurations sold;
- length and variability of the sales cycle for our products;
- application of complex revenue recognition accounting rules to our customer arrangements;
- timing of revenue recognition;
- changes in our pricing policies, the pricing policies of our competitors and the prices of the components of our products;
- market acceptance of new products, product enhancements and services that we offer;
- the quality and level of our execution of our business strategy and operating plan, and the effectiveness of our sales and marketing programs;
- new product announcements, introductions and enhancements by us or our competitors, which could result in deferrals of customer orders;
- our ability to develop, introduce, ship and successfully deliver new products and product enhancements that meet customer requirements in a timely manner;
- our reliance on contract manufacturers for the production and shipment of our appliance products;

- our or our contract manufacturers' ability to obtain sufficient supplies of sole or limited source components or materials;
- our ability to attain and maintain production volumes and quality levels for our products;
- variability and unpredictability in the rate of growth in the markets in which we compete;
- costs related to mergers, acquisitions and divestitures; and
- corporate restructurings.

Equipment purchases by communications service providers and enterprises continue to be unpredictable. As with other telecommunications product suppliers, we typically recognize a portion of our revenue in a given quarter from sales booked and shipped in the last weeks of that quarter. As a result, delays in customer orders may result in delays in shipments and recognition of revenue beyond the end of a given quarter. Additionally, we rely on the revenue provided by certain large customers. It can be difficult for us to predict the timing of receipt of major customer orders, and we are unable to control their timing decisions. In the past, we have experienced significant variability in the spending patterns and purchasing practices of our large customers on a quarterly and annual basis, and we expect that this variability will continue. Consequently, our quarterly operating results are difficult to predict even in the short term and a delay in an anticipated sale past the end of a particular quarter may negatively impact our results of operations for that quarter, or in some cases, that year. Therefore, we believe that quarter-to-quarter comparisons of our operating results are not a good indication of our future performance. If our revenue or operating results fall below the expectations of investors or securities analysts or below any guidance we may provide to the market, the price of our common stock could decline substantially. Such a stock price decline could also occur even if we meet our publicly stated revenue and/or earnings guidance.

A significant portion of our operating expenses is fixed in the short term. If revenue for a particular quarter is below expectations, we may not be able to reduce costs and expenses proportionally for that quarter. Any such revenue shortfall would, therefore, have a significant effect on our operating results for that quarter.

We have incurred net losses and may incur additional net losses.

We incurred net losses in fiscal years 2018, 2017 and 2016. We may incur additional net losses in future quarters and years. Our revenue may not grow, and we may never generate sufficient revenue to sustain profitability. Any failure by us to achieve, sustain or increase profitability on a consistent basis could cause the value of our common stock to decline.

If we fail to compete successfully against telecommunications equipment and networking companies, our ability to increase our revenue and achieve profitability will be impaired.

Competition in the telecommunications market is intense. The market is shifting from a market dominated by a few large incumbent telecommunications equipment companies, such as Ericsson LM Telephone Company, Huawei Technologies Co. Ltd. and Nokia Corporation, to a market with competitors that are characterized by network virtualization, migration to the cloud, and open interfaces. We believe this shift creates opportunities for us, as well as our direct competitors in telecommunications and networking, including:

- Within the network transformation space, mid-size vendors of networking and telecommunications equipment and specialty vendors, including AudioCodes Ltd., Dialogic Inc., Mavenir Systems, Inc., Metaswitch Networks Corporation, Oracle Corporation (Session Border Controller), and ADTRAN, Inc.;
- Within the enterprise and cloud solutions space, 8x8, Inc., Avaya Inc., Bandwidth Inc., Cisco Inc. (with Broadsoft, Inc.), Mitel Networks Corporation (with ShoreTel, Inc.), Plivo Inc., RingCentral, Inc., Twilio Inc., Telestax Inc., Fuze, Inc., Genesys and Vonage Holdings Corp. (with Nexmo, Inc. and Tokbox Inc.); and
- Within the audio and video security and analytics space, SecureLogix Corporation, RedShift Networks Corporation, Empirix Inc. and Oracle Corporation.

Mergers among any of these or other competitors could strengthen their ability to compete against us, and additional competitors with significant financial resources entering our markets could further intensify competition.

Many of our current and potential competitors have significantly greater selling and marketing, technical, manufacturing, financial and other resources than we have. Further, some of our competitors sell significant amounts of other products to our current and prospective customers and have the ability to offer lower prices to win business. Our competitors' broad product portfolios, coupled with already existing relationships, may cause our customers to buy our competitors' products or harm our ability to attract new customers.

To compete effectively, we must deliver innovative products that:

- provide extremely high reliability and quality;
- deploy and scale easily and efficiently;
- interoperate with existing network infrastructures and multivendor solutions;
- provide effective network management;
- are accompanied by comprehensive customer support and professional services;
- provide a cost-effective and space-efficient solution for enterprises and service providers;
- meet price competition from low cost equipment providers; and
- offer solutions that are timely for the market and support where the industry is heading.

If we are unable to compete successfully against our current and future competitors, we could experience price reductions, order cancellations and loss of customers and revenue, and our operating results could be adversely affected.

We will not be successful if we do not grow our customer base or if we are unable to generate recurring business from our existing customers.

We rely on certain key customers, and our future success will depend on our ability to generate recurring business from our existing customers and to attract additional customers beyond our current customer base. One customer, Verizon Communications Inc., contributed 17% of our revenue in both 2018 and 2017, and one customer, AT&T Inc., contributed 12% of our revenue in 2016. In addition, our top five customers contributed approximately 38% of our revenue in 2018 and approximately 41% of our revenue in 2017. Factors that may affect our ability to grow our customer base include but are not limited to the following:

- economic conditions that discourage potential new customers from making the capital investments required to adopt new technologies;
- deterioration in the general financial condition of service providers and enterprises, or their ability to raise capital or access lending sources;
- new product introductions by our competitors; and
- the development of our channel partner program.

Due to the nature of certain of our product offerings, the per-order revenue from orders placed by the majority of our new customers is generally lower than the per-order revenue generated from our historical customer orders. If we are unable to expand our customer base, we will be forced to rely on generating recurring revenue from existing customers, which may not be successful. We expect that, for the foreseeable future, the majority of our revenue will continue to depend on sales of our products to a limited number of existing customers or sales to customers with lower per-order revenue than those generated from our historical sales. Factors that may affect our ability to generate recurring revenue from our existing customers include but are not limited to the following:

- customer willingness to implement our products;
- pricing pressures due to the commoditization of our products;
- the timing of industry transitions to new network technologies;
- acquisitions of or by our customers;
- delays or difficulties that we may incur in completing the development and introduction of our planned products or product enhancements;
- failure of our products to perform as expected; and
- difficulties we may incur in meeting customers' delivery requirements or with software development, appliance design, manufacturing or marketing of our products and/or services.

The loss of any significant customer, or any substantial reduction in purchase orders or deferral of purchasing decisions from these customers, could materially adversely affect our results of operations and financial condition.

Third parties may terminate or alter existing contracts or relationships with us.

Third parties, including customers, suppliers, vendors, landlords, licensors and other business partners, with whom either, or both, Sonus and GENBAND had relationships, may terminate or otherwise reduce the scope of their relationship with us. Any such disruptions could cause us to suffer a loss of potential future revenue and/or lose rights that are material to our business.

Consolidation in the telecommunications industry could harm our business.

The telecommunications industry, including many of our customers, has experienced consolidation, including, in the carrier space:

- the pending merger between T-Mobile US, Inc. and Sprint Corporation (announced in April 2018);
- the acquisition of Hawaiian Telecom, Inc. by Cincinnati Bell Inc. in July 2018;
- the acquisition of Level 3 Communications Inc. by CenturyLink Inc. in November 2017;
- the acquisition of XO Communications, LLC by Verizon Communications Inc. in February 2017; and
- the acquisition of Time Warner Cable Inc. and Bright House Networks, LLC by Charter Communications, Inc. in May 2016.

Further, consolidation has occurred in the vendor space, including:

- the acquisition of Spoken Communications Inc. by Avaya Holdings Corp. in March 2018;
- the acquisition of Broadsoft, Inc. by Cisco Systems, Inc. in February 2018;
- the acquisition of ShoreTel Inc. by Mitel Networks Corporation in September 2017;
- the combination of Mitel Mobility, Inc., Xura, Inc. and Ranzure Networks, Inc, and re-branding as Mavenir Systems, Inc., by Siris Capital Group LLC, a private equity investment firm, in December 2016;
- the acquisition of Alcatel-Lucent S.A. by Nokia Corporation in November 2016;
- the acquisition of Polycom, Inc. by Siris Capital Group LLC, in September 2016;
- the acquisition of Nexmo, Inc. by Vonage Holdings Corp. in June 2016;
- the acquisition of Tropo Inc. by Cisco Systems, Inc. in May 2015;
- the acquisition of Aruba Networks, Inc. by HP Inc. in May 2015;
- the acquisition of Riverbed Technology, Inc. by Thoma Bravo, LLC, a private equity investment firm, in April 2015;
- the acquisition of Dialogic Inc. by Novacap TMT IV, L.P. in 2014; and
- the acquisitions of Acme Packet, Inc. and Tekelec, Inc. by Oracle Corporation in 2013.

We expect this trend to continue. Consolidation among our customers may cause delays or reductions in capital expenditure plans by such customers and/or increased competitive pricing pressures as the number of available customers declines and the relative bargaining power of customers increases in relation to suppliers. Any of these factors could materially adversely affect our business.

Restructuring activities could adversely affect our ability to execute our business strategy.

We recorded net restructuring expense of $29.2 million in the aggregate in 2018, 2017 and 2016, comprised of $26.7 million for severance and related costs and $2.5 million related to facilities. We expect to record approximately $5 million of additional restructuring expense in 2019.

Our current restructuring and any future restructuring, should it become necessary for us to continue to restructure our business due to worldwide market conditions or other factors that reduce the demand for our products and services, could adversely affect our ability to execute our business strategy in a number of ways, including through:

- loss of key employees;
- diversion of management's attention from normal daily operations of the business;
- diminished ability to respond to customer requirements related to both products and services;
- decrease in cash and profits related to severance payments and facility termination costs;
- disruption of our engineering and manufacturing processes, which could adversely affect our ability to introduce new products and to deliver products both on a timely basis and in accordance with the highest quality standards; and/or
- reduced ability to execute effectively internal administrative processes, including the implementation of key information technology programs.

There can be no assurance that any restructuring actions we have taken in the past, or may take in the future, will improve our financial condition or results of operations.

We are exposed to the credit risk of some of our customers and to credit exposures in fragile financial markets, which could result in material losses.

Due to our reliance on significant customers, we are dependent on the continued financial strength of our customers. If one or more of our significant customers experience financial difficulties, it could result in uncollectable accounts receivable and our loss of significant customers and anticipated revenue.

Most of our sales are on an open credit basis, with typical payment terms of 30 to 90 days. We evaluate and monitor individual customer payment capability in granting such open credit arrangements, seeking to limit such open credit to amounts we believe our customers can pay and maintain reserves that we believe are adequate to cover exposure to doubtful accounts. However, there can be no assurance that our open credit customers will pay the amounts they owe to us or that the reserves we maintain will be adequate to cover such credit exposure. Our sales derived through our distributors, in particular, represent sources of increased credit risk as distributors tend to have more limited financial resources than other resellers and end-user customers.

Our customers' failure to pay and/or our failure to maintain sufficient reserves could have a material adverse effect on our results of operations and financial condition. Additionally, in the event that turmoil in the credit markets makes it more difficult for some customers to obtain financing, those customers' ability to pay could be adversely impacted, which in turn could have a material adverse impact on our business, results of operations and financial condition.

Disruptions to, or our failure to effectively develop relationships with and manage, distributors, resellers, system integrators and other channel partners, and the processes and procedures that support them, could adversely affect our ability to generate revenue from the sale of our products and services.

We continue to enhance our sales strategy, which we expect will include more partner sales engagements to resell our products and services through authorized distributors, VARs, system integrators and other channel partners. Our future success is dependent upon establishing and maintaining successful relationships with a variety of distributors, VARs, system integrators and other channel partners. We may also need to pursue strategic partnerships with vendors that have broader technology or product offerings in order to compete with end-to-end solution providers. In addition, many of the enterprise markets we are pursuing require a broad network of resale partners in order to achieve effective distribution.

Many of our distribution and channel partners sell competitive products and services, and the loss of, or reduction in sales by, these partners could materially reduce our revenue. Our sales through channel partners typically involve the use of our products as components of a larger solution being implemented by systems integrators. In these instances, the purchase and sale of our products are dependent on the channel partners, who typically control the timing, prioritization and implementation of projects. Project delays, changes in priority or solution re-design decisions by the systems integrator can adversely affect our product sales. If we fail to maintain relationships with our distribution, VAR and systems integration partners, fail to develop new relationships with other partners in new markets, fail to manage, train or provide incentives to our existing partners effectively, or if these partners are not successful in their sales efforts, sales of our products and services may decrease and our operating results could suffer. Moreover, if we do not have adequate personnel, experience and resources to manage the relationships with our partners and to fulfill our responsibilities under such arrangements, any such shortcomings could have a material adverse impact on our business and results of operations.

In addition, we recognize some of our revenue based on a drop-ship model using information provided by our partners. If those partners provide us with inaccurate or untimely information, the amount or timing of our revenue could be adversely affected. We may also be impacted by financial failure of our partners, which could result in our inability to collect accounts receivable in full, and thereby materially adversely affect our results of operations and financial condition.

If our strategic plan, including our research and development of innovative new products and the improvement of existing products, is not aligned with our customers' investments in the evolution of their networks, or if our products and services do not meet customers' demands, customers may not buy our products or use our services.

Success in our industry requires large investments in technology and creates exposure to rapid technological and market changes. We spend a significant amount of time, money and resources both developing new technology, products and solutions and acquiring new businesses or business assets. Our strategic plan includes a significant shift in our investments from mature technologies that previously generated significant revenue for us toward certain next-generation technologies, as well as working with channel partners to sell our products. Our choices of specific technologies to pursue, and those to de-emphasize, may prove to be inconsistent with our customers' investment spending. Moreover, if we invest in the development of technologies, products and solutions that do not function as expected, are not adopted by the industry, are not ready in time, are not accepted by our customers as quickly as anticipated or at all, mature more quickly than we anticipated or are not successful in the marketplace, our sales and earnings may suffer and, as a result, our stock price could decline.

In order for us to be successful, our technologies, products and solutions must be accepted by relevant standardization bodies and by the industry as a whole. To achieve market acceptance for our products, we must effectively anticipate, and adapt in a timely manner to, customer requirements and offer products and services that meet changing customer demands. Prospective

customers may require product features and capabilities that our current products do not have. The introduction of new or enhanced products also requires that we carefully manage the transition from older products in order to minimize disruption in customer ordering patterns and ensure that adequate supplies of new products can be delivered to meet anticipated customer demand. If we fail to develop products and offer services that satisfy customer requirements or if we fail to effectively manage the transition from older products, our ability to create or increase demand for our products and services could be seriously harmed, we may lose current and prospective customers and our results of operations and financial condition could be materially adversely affected.

If our products do not interoperate with our customers' existing networks, we may not retain current customers or attract new customers.

Many of our customers will require that our products be designed to interface with their existing networks, each of which may have different specifications. Issues caused by an unanticipated lack of interoperability may result in significant warranty, support and repair costs, divert the attention of our engineering personnel from our appliance and software development efforts and cause significant customer relations problems. If our products do not interoperate with those of our customers' networks, installations could be delayed or orders for our products could be canceled, which would seriously harm our gross margins and result in loss of revenue or customers.

We believe the telecommunications industry is in the early stages of a major architectural shift to the virtualization of networks. If the architectural shift does not occur, if it does not occur at the pace we predict, or if the products and services we have developed are not attractive to our customers after such shift takes place, our revenue could decline.

We believe the telecommunications industry is in the early stages of transitioning to the virtualization of networks, and we are developing products and services that we believe will be attractive to our customers and potential customers who make that shift. While we anticipate that the industry shift to a software-centric cloud-based architecture is likely to happen, fundamental changes like this often take time to accelerate. In addition, our customers may adapt to such changes at varying rates. As our customers take time to determine their future network architectures, we may encounter delayed timing of orders, deferred purchasing decisions and reduced expenditures by our customers. These longer decision cycles and reduced expenditures may negatively impact our revenue or make it difficult for us to accurately predict our revenue, either of which could materially adversely affect our results of operations and cause our stock price to decline.

Virtualization of our product portfolio could slow our revenue growth.

Virtualization of our product portfolio could slow our revenue growth as we move away from appliance products and increasingly focus on software-based products. Historically, we have produced highly complex products that incorporate appliances with embedded software components. As we virtualize our product portfolio, we expect our margins to improve due to decreased costs tied to production and sales of our appliance products, including costs related to our reliance on third-party contract manufacturers, interruptions or delays in the supply of appliance components from such third-party sources, and existing appliance support services. While we expect our margins to improve as a result of such reductions in cost, our revenue may decline as a result of the decreases in sales of appliance products, many of which have generated higher revenue on a per-unit basis than certain of our software products.

If the market for our voice infrastructure products continues to significantly decline and if our Security and Application products sales do not accelerate as quickly as we anticipate, our operating results could suffer.

In 2018, the macro-environment for our media gateway trunking and softswitch business continued to face significant declining revenue. Our customers are consolidating, which is both delaying and curtailing their capital spending. Even though we continue to transform our company from a media gateway trunking business to a Security and Applications Business (comprised of Session Border Controllers, Kandy and Unified Communications servers), a portion of our current revenue remains dependent upon the commercial success of our voice infrastructure products, which we believe will also remain true for the foreseeable future. If the market for these products declines more than anticipated and if our Security and Application products sales to not accelerate as quickly as we anticipate, our operating results could suffer.

The market for some of our products depends on the availability and demand for other vendors' products.

Some of our products, particularly those addressing the Unified Communications market, are designed to function with other vendors' products. In these cases, demand for our products is dependent upon the availability, demand for, and sales of the other vendors' products, as well as the degree to which our products successfully interoperate with the other vendors' products and add value to the solution being provided to the customer. If the other vendors change the design of their products, delay the issuance of new releases, fail to adequately market their products, or are otherwise unsuccessful in building a market for their products, the demand for our products will be adversely affected, which could adversely affect our business, results of operations and financial condition.

Failure by our strategic partners or by us in integrating products provided by our strategic partners could harm our business.

Our solutions include the integration of products supplied by strategic partners, who offer complementary products and services. We rely on these strategic partners in the timely and successful deployment of our solutions to our customers. If the products provided by these partners have defects or do not operate as expected, if the services provided by these partners are not completed in a timely manner, if our partners have organizational or supply issues, or if we do not effectively integrate and support products supplied by these strategic partners, then we may have difficulty with the deployment of our solutions that may result in:

- loss of, or delay in, revenue;
- increased service, support and warranty costs and a diversion of development resources; and
- network performance penalties.

In addition to cooperating with our strategic partners on specific customer projects, we also may compete in some areas with these same partners. If these strategic partners fail to perform or choose not to cooperate with us on certain projects, in addition to the effects described above, we could experience:

- loss of customers and market share; and
- failure to attract new customers or achieve market acceptance for our products.

Our large customers have substantial negotiating leverage, and they may require that we agree to terms and conditions that may have an adverse effect on our business.

Large communications service providers have substantial purchasing power and leverage in negotiating contractual arrangements with us. These customers may, among other things, require us to develop additional features, require penalties for failure to deliver such features, require us to partner with a certain reseller before purchasing our products and/or seek discounted product and/or service pricing. As we sell more products to this class of customer, we may be required to agree to terms and conditions that are less favorable to us, which may affect the timing of revenue recognition, amount of deferred revenue or product and service margins and may adversely affect our financial position and cash flows in certain reporting periods.

We depend upon contract manufacturers. If our contract manufacturers fail to perform, or if we change or consolidate manufacturers, we may fail to meet the demands of our customers and damage our customer relationships, which could materially adversely affect our business.

While we currently work with four contract manufacturers, we primarily rely upon two large global manufacturers to assemble our products according to our specifications and to fulfill orders on a timely basis. Reliance on a third-party manufacturer involves a number of risks, including a lack of control over the manufacturing process, inventory management and the potential absence or unavailability of adequate capacity. As we do not have the internal manufacturing capabilities to meet our customers' demands, any difficulties or failures to perform by our contract manufacturers could cause delays in customer product shipments, which could negatively affect our relationships with customers and result in delayed revenue.

In addition, any future changes to or consolidations of our current contract manufacturers could lead to material shortages or delays in the supply of our products. Qualifying a new contract manufacturer to commence commercial scale production or consolidating to a reduced number of contract manufacturers are expensive and time-consuming activities and could result in a significant delay in the supply of our products, which could negatively affect our relationships with customers and result in delayed revenue.

We and our contract manufacturers rely on single or limited sources for supply of some components of our products and if we fail to adequately predict our manufacturing requirements or if our supply of any of these components is disrupted, we will be unable to ship our products in a timely manner, or at all.

We and our contract manufacturers currently purchase several key components of our products, including commercial digital signal processors, from single or limited sources. Depending upon the component, there may or may not be alternative sources

of substitutes. We purchase these components on a purchase order basis. If we overestimate our component and finished goods requirements, we could have excess inventory, which would increase our costs. If we underestimate our requirements, we may not have an adequate supply, which could interrupt manufacturing of our products and result in delays in shipments and revenue. Additionally, if any of our contract manufacturers underestimates our requirements, it may not have an adequate supply, which could interrupt manufacturing of our products and result in delays in shipments and revenue. If any of our sole or limited source suppliers experiences capacity constraints, work stoppages or other reductions or disruptions in output, it may not be able to meet, or may choose not to meet, our delivery schedules. Moreover, we have agreed to compensate our contract manufacturers in the event of termination or cancellation of orders, discontinuance of product or excess material.

We currently do not have long-term supply contracts with our component suppliers and they are not required to supply us with components for any specified periods, in any specified quantities or at any set price, except as may be specified in a particular purchase order. In the event of a disruption or delay in supply or our inability to obtain components, we may not be able to develop an alternate source in a timely manner or at favorable prices, or at all. While we regularly monitor our inventory of supplies, a failure to find acceptable alternative sources could hurt our ability to deliver high-quality products to our customers and negatively affect our operating margins.

Reliance on our suppliers exposes us to potential supplier production difficulties, quality variations and unforeseen price increases. Our customers rely upon our ability to meet committed delivery dates, and any disruption in the supply of key components would seriously adversely affect our ability to meet these dates and could result in loss of customers, harm to our ability to attract new customers, or legal action by our customers. Defense-expedite rated orders from the U.S. federal government, which by law receive priority, can also interrupt scheduled shipments to our other customers. Additionally, any unforeseen increases in the prices of components could reduce our profitability or force us to increase our prices, which could result in a loss of customers or harm our ability to attract new customers and could have a material adverse effect on our results of operations.

Our customer contracts also generally allow customers to reschedule delivery dates or cancel orders within certain time frames before shipment without penalty and outside those times frames with a penalty. Because of these and other factors, there are risks of excess or inadequate inventory that could negatively affect our expenses and results of operations.

If we are unable to obtain necessary licenses or on-going maintenance and support of third-party technology at acceptable prices, on acceptable terms, or at all, it could harm our operating results or business.

We have incorporated third-party licensed technology, including open source software, into our current products. From time to time, we may be required to license additional technology from third parties to develop new products or product enhancements. Third-party licenses and on-going maintenance and support may not be available or continue to be available to us on commercially reasonable terms or may be available to us but only at significantly escalated pricing. Additionally, we may not be able to replace the functionality provided by third-party software currently offered with our products if that software becomes obsolete, defective or incompatible with future versions of our products or is not adequately maintained or updated. If we are unable to maintain or re-license any third-party licenses required in our current products or obtain any new third-party licenses to develop new products and product enhancements, or in the case of any defects in these third-party software products, we could be required to obtain substitute technology of lower quality or performance standards or at greater cost, and we may be delayed or prevented from making these products or enhancements, any of which could seriously harm our sales and the competitiveness of our products unless and until we can secure an alternative source. Such alternate sources may not provide us with the same functionality as that currently provided to us.

The appliance products that we purchase from our third-party vendors have life cycles, and some of those products have reached the end of their life cycles. If we are unable to correctly estimate future requirements for these products, it could harm our operating results or business.

Some of the appliance products that we purchase from our third-party vendors have reached the end of their life cycles. It may be difficult for us to maintain appropriate levels of the discontinued appliances to adequately ensure that we do not have a shortage or surplus of inventory of these products. If we do not correctly forecast the demand for such appliances, we could have excess inventory and may need to write off the costs related to such purchases. The write-off of surplus inventory could materially adversely affect our operating results. However, if we underestimate our forecast and our customers place orders to purchase more products than are available, we may not have sufficient inventory to support their needs. If we are unable to provide our customers with enough of these products, it could make it difficult to retain certain customers, which could have a material and adverse effect on our business.

Because our larger scale products are sophisticated and designed to be deployed in complex networks around the world, they may have errors or defects that we find only after full deployment. These defects, and any failure to establish a support infrastructure and maintain required support levels, could seriously harm our business.

Our larger scale products are sophisticated and are designed to be deployed in large and complex networks around the world. Because of the nature of our products, they can only be fully tested when substantially deployed in these networks. Some of our customers may discover errors or defects in the software or appliances, or the products may not operate as expected only after full deployment. As we continue to expand our distribution channel through distributors and resellers, we will need to rely on and support their service and support organizations. If we are unable to fix errors or other performance problems that may be identified after full deployment of our products, we could experience:

- loss of, or delay in, revenue or increased expense;
- loss of customers and market share;
- failure to attract new customers or achieve market acceptance for our products;
- increased service, support and warranty costs and a diversion of development resources; and/or
- costly and time-consuming legal actions by our customers.

Our customers expect us to establish a support infrastructure and maintain demanding support standards to ensure that their networks maintain high levels of availability and performance. To continue to support our customers with these larger scale products, our support organization will need to provide service and support at a high level throughout the world. If we are unable to provide the expected level of support and service to our customers, we could experience:

- loss of customers and market share;
- failure to attract new customers in new markets and geographies;
- increased service, support and warranty costs and a diversion of development resources; and/or
- network performance penalties.

Any errors or defects in our products, and any failure to establish a support infrastructure and maintain required support levels, could materially adversely affect our business and results of operations.

Disruptions to, or our failure to effectively develop, manage and maintain our government customer relationships could adversely affect our ability to generate revenue from the sales of our products to these customers. Further, such government sales are subject to potential delays and cutbacks, may require specific testing efforts, or impose significant compliance obligations.

A portion of our total revenue from product sales comes from contracts with U.S. federal government agencies, none of which currently contemplates long-term purchase commitments. Disruptions to, or our failure to effectively develop, manage and maintain our government customer relationships, could adversely affect our ability to generate revenue from the sales to such customers. Governments routinely investigate and audit government contractors' administrative processes, and any unfavorable audit could result in the government refusing to continue buying our products and services, a reduction of revenue or fines or civil or criminal liability if the audit uncovers improper or illegal activities, which could materially adversely impact our operating results.

Furthermore, a majority of our government sales involve products that have or will soon reach the end of their life cycles, and such government sales for these older products have declined substantially in recent periods. Sales of our newer products to governmental agencies for broad deployment may not develop quickly, if at all, or be sufficient to offset future declines in sales of these legacy products. Additionally, spending by government customers fluctuates based on budget allocations and the timely passage of the annual federal budget.

Among the factors that could impact federal government spending and which would reduce our federal government contracting and subcontracting business are a significant decline in, or reapportioning of, spending by the federal government, changes as a result of the current presidential administration, changes, delays or cancellations of federal government programs or requirements, the adoption of new laws or regulations that affect companies that provide services to the federal government, federal government shutdowns or other delays in the government appropriations process, changes in the political climate, including with regard to the funding for products we provide, delays in the payment of our invoices by government payment offices, and general economic conditions. The loss or significant curtailment of any government contracts or subcontracts, whether due to our performance or due to interruptions or changes in governmental funding for such contracts or subcontracts, could have a material adverse effect on our business, results of operations and financial condition.

Further, sales to government customers may require specific testing efforts or impose significant compliance or certification obligations. For example, the Department of Defense ("DOD") has issued specific requirements for IP networking products for features and interoperability. In order for a vendor's product to be used to connect to the DOD network, that product must pass a series of significant tests and be certified by the Joint Interoperability Test Command ("JITC"). Certain of our products are already certified by JITC. However, if we are unable to obtain JITC certification as needed, our DOD sales, and hence our revenue and results of operations, may suffer.

If we fail to realize the anticipated benefits from any recent acquisitions, such as our acquisition of Edgewater Networks, Inc. ("Edgewater") in August 2018 (the "Edgewater Acquisition"), on a timely basis, or at all, our business and financial condition may be adversely affected.

We may fail to realize the anticipated benefits from any recent acquisitions, including the Edgewater Acquisition, on a timely basis, or at all, for a variety of reasons, including but not limited to the following:

- problems or delays in assimilating or transitioning to us the acquired assets, operations, systems, processes, controls, technologies, products or personnel;
- loss of acquired customer accounts;
- unanticipated costs associated with the acquisitions;
- failure to identify in the due diligence process or assess the magnitude of certain liabilities we assumed in the acquisitions, which could result in unexpected litigation or regulatory exposure, unfavorable accounting treatment, unexpected increases in taxes due, significant issues with product quality or development or other adverse effects on our business or results of operations;
- multiple or overlapping product lines as a result of the acquisitions that are offered, priced and supported differently, which could cause customer confusion and delays;
- higher than anticipated costs in continuing support and development of acquired products and services;
- diversion of management's attention from our core business and the challenges of managing larger and more widespread operations from the acquisitions;
- adverse effects on existing business relationships of any of the acquired businesses with their respective suppliers, licensors, contract manufacturers, customers, distributors, resellers and industry experts;
- significant impairment, exit and/or restructuring charges if the products or technologies acquired in the acquisitions do not meet our sales expectations or are unsuccessful;
- insufficient revenue to offset increased expenses associated with the acquisitions;
- risks associated with entering markets in which we have no or limited prior experience;
- potential loss of the employees we acquired in the acquisitions or our own employees; and/or
- failure to properly integrate internal controls and financial systems of the combined companies.

If we are unable to successfully manage these issues, the anticipated benefits and efficiencies of our recent acquisitions may not be realized fully or at all, or may take longer to realize than expected, and our ability to compete and our results of operations may be adversely affected.

Any future investments, mergers or acquisitions we make or enter into, as applicable, could be difficult to integrate, disrupt our business, dilute shareholder value and seriously harm our financial condition.

We are not currently a party to any material pending merger or acquisition agreements. However, we may merge with or acquire additional businesses, products or technologies in the future. No assurance can be given that any future merger or acquisition will be successful or will not materially adversely affect our business, operating results or financial condition. We continue to review opportunities to merge with or acquire other businesses or technologies that would add to our existing product line, complement and enhance our current products, expand the breadth of our product and service offerings, enhance our technical capabilities or otherwise offer growth opportunities. If we enter into a merger or make acquisitions in the future, we could, among other things:

- issue stock that would dilute existing stockholders' percentage ownership;
- incur debt or assume liabilities;
- reduce significantly our cash and investments;
- incur significant impairment charges related to the write-off of goodwill and intangible assets;
- incur significant amortization expenses related to intangible assets; and/or
- incur large and immediate write-offs for in-process research and development and stock-based compensation.

Mergers and acquisitions are inherently risky and subject to many factors outside of our control. Therefore, we cannot be certain that we would be successful in overcoming problems in connection with our past or future acquisitions. Our inability to do so could significantly harm our business, revenue, and results of operations.

Failure to hire and retain key personnel, or the loss of any of our executive officers, could negatively impact our ability to meet our business objectives and impair our future growth.

Our business depends upon highly skilled technical, managerial, engineering, sales, marketing and customer support personnel. Competition for these personnel is intense, especially during times of economic recovery or growth. Any failure to hire, assimilate in a timely manner and retain key qualified personnel, particularly engineering and sales personnel, could impair our growth and make it difficult to meet key objectives, such as timely and effective product introductions. The challenge of retaining key employees could be increasingly difficult due to strong industry competition. In addition, our ability to attract and retain key employees could be adversely impacted if we do not have a sufficient number of shares available under the Amended and Restated Stock Incentive Plan to issue to our employees, or if our stockholders do not approve requested share increases or a new equity incentive plan. We may not be able to locate suitable employees for any key employee who leaves or offer employment to potential replacements on reasonable terms.

Our future success also depends upon the continued services of our executive officers who have critical industry experience and relationships that we rely on to implement our business plan. With the exception of certain key employees based in the European Union, none of our officers or key employees is bound by an employment agreement for any specific term. The loss of the services of any of our executive officers or key employees could delay the development and introduction of, and negatively impact our ability to sell, our products and achieve our business objectives.

The terms of our credit agreement could adversely affect our operating flexibility and pose risks of default or springing maturity, which would negatively impact our liquidity and operations. In addition, we may not be able to refinance our debt or obtain additional financing on favorable terms, or at all.

Our credit facility with Silicon Valley Bank includes $100 million of commitments, the full amount of which is available for revolving loans, a $15 million sublimit that is available for letters of credit and a $15 million sublimit that is available for swingline loans. The senior secured credit facility is scheduled to mature in December 2021, subject to a springing maturity if, on or before July 14, 2020, the existing promissory note issued to certain shareholders is not converted or extended to March 2022 or later. The credit agreement includes procedures for additional financial institutions to become lenders, or for any existing lender to increase its commitment under the facility, subject to an available increase of $50 million for all incremental commitments under the credit agreement, without amendment. The credit agreement was amended on June 24, 2018, to, among other things, permit the acquisition of Edgewater and related transactions. Provisions in the credit agreement impose limitations on our ability to, among other things, incur additional indebtedness, create liens, make acquisitions or engage in mergers, enter into transactions with affiliates, dispose of assets, make certain investments and amend or repay certain junior debt.

In addition, we are required to meet certain financial covenants customary for financings of this type. Our failure to comply with these covenants may result in the declaration of an event of default, which could cause us to be unable to borrow under the credit facility or result in the acceleration of the maturity of indebtedness outstanding under the credit facility at such time. If the maturity of our indebtedness is accelerated, we may not have sufficient funds available for repayment or we may not have the ability to borrow or obtain sufficient funds to replace the accelerated indebtedness on terms acceptable to us, or at all.

The United Kingdom's Financial Conduct Authority, which regulates the London Inter-bank Offered Rate ("LIBOR"), has announced that it intends to stop encouraging or requiring banks to submit LIBOR rates after 2021, and it is unclear if LIBOR will cease to exist or if new methods of calculating LIBOR will evolve. We currently have the option to determine our interest rate that includes either the LIBOR rate or the base rate. If LIBOR ceases to exist or the methods of calculating LIBOR change from their current form, we may no longer have the ability to elect the LIBOR rate option under our current credit facility, and our current or future indebtedness may be adversely affected. This could impact our interest costs and our ability to borrow additional funds under this credit facility.

We had $55 million of borrowings outstanding at a weighted average interest rate of 5.96% under the credit facility as of December 31, 2018. In addition, we had $2.7 million of letters of credit outstanding at an interest rate of 1.75% under the credit facility as of December 31, 2018. If we are prevented from borrowing or if we are unable to extend, renew or replace the credit facility by the maturity date of December 2021, or an early springing maturity date, on favorable terms, or at all, this could have a material adverse effect on our liquidity and cause our business, operations and financial condition to suffer. If the

credit facility is subjected to the early springing maturity, we may not have sufficient funds available for repayment or we may not have the ability to borrow or obtain sufficient funds to replace the indebtedness on terms acceptable to us, or at all.

In addition, we cannot be sure that our current cash, cash equivalents, marketable securities and available borrowings under our credit facility will be sufficient to meet our future needs. If we are unable to generate sufficient cash flows in the future, and if availability under our current facility is not sufficient to support our operations, we may need to refinance our debt or obtain additional financing. We may not be able to refinance our debt or obtain additional financing on favorable terms or at all.

Litigation and government investigations could result in significant legal expenses and settlement payments, fines or damage awards.

From time to time, we are subject to litigation regarding intellectual property rights or other claims. In the past, we have also been named as a defendant in securities class action and stockholder derivative lawsuits. We are generally obliged, to the extent permitted by law, to indemnify our current and former directors and officers who are named as defendants in these lawsuits. Defending against litigation may require significant attention and resources of management. Regardless of the outcome, such litigation could result in significant legal expenses. For instance, we are involved in six patent infringement lawsuits involving Metaswitch Networks Ltd., Metaswitch Networks Corp. and Metaswitch Inc. (collectively, “Metaswitch”). In five of the six lawsuits, we are the plaintiff and, in three of the lawsuits, we are a counterclaim defendant. In the sixth case, we are the defendant. At this time, it is not possible to predict the outcome of the ongoing lawsuits, including whether or not any proceedings will continue, and when or how these matters will be resolved or whether we will ultimately receive, and in what sum, amounts previously awarded as a result of these proceedings. Regardless of whether we are ultimately successful in these lawsuits, we will likely elect to continue to incur substantial legal fees in connection with these matters.

We have also been subject to employment claims in connection with employee terminations and may be subject to additional claims in the future. In addition, companies in our industry whose employees accept positions with us may claim that we have engaged in unfair hiring practices. These claims may result in material litigation. We could incur substantial costs defending ourselves or our employees against these claims, regardless of their merits. Further, defending ourselves from these types of claims could divert our management's attention from our operations. The quantity and cost of employment claims may rise as a result of our increasing international expansion and the Merger.

In addition, we are from time to time subject to investigations by the government. For example, we fully cooperated with an SEC inquiry regarding the development and issuance of Sonus' first quarter 2015 revenue and earnings guidance. We reached an agreement with the SEC in principle to resolve this matter and on August 7, 2018, the SEC's Division of Enforcement issued a Cease and Desist Order (the "Order"). As part of the Order, the findings of which we neither admitted nor denied, we agreed to pay a $1.9 million civil penalty and agreed not to violate the securities laws in the future. There is no assurance that we will not be subject to similar investigations by the SEC or other government agencies in the future.

If the defenses we claim in our material litigation matters are ultimately unsuccessful, or if we are unable to achieve a favorable settlement with an adverse party or a government agency, we could be liable for large settlement payments, damage awards or fines that could have a material adverse effect on our business and results of operations.

A breach of the security of our information systems or those of our third-party providers could adversely affect our operating results.

We rely upon our information systems and, in certain circumstances, those of our third-party providers, such as vendors, consultants and contract manufacturers, to protect our sensitive or proprietary information and information of or about our customers, to develop and provide our products and services to customers, and to otherwise operate our business. Our information systems and those of our third-party providers are vulnerable to threats such as computer hacking, cyber-terrorism or other unauthorized activity that may result in third party access to or modification, corruption or deletion of our or our customers' sensitive or proprietary information or other disruptions to our business. Such cyberattacks and other cyber incidents are occurring more frequently, are constantly evolving, are becoming more sophisticated and can take many forms. While we believe that we leverage best-in-class detection and prevention systems and services and that we focus on continuous improvement based upon the latest attack vectors in the industry, we cannot guarantee that there will never be any information technology system failures, including a breach of our or our third-party providers' data security measures through a cyberattack, other cyber incident or otherwise, or the theft or loss of laptops, other mobile devices or electronic records used to back up our systems or our third-party providers' systems, which could result in a disclosure of customer, employee, or our information or otherwise disrupt our ability to function in the normal course of business by potentially causing, among other things, delays in the fulfillment or cancellation of customer orders or disruptions in the manufacture or shipment of products or delivery of services, any of which could have a material adverse effect on our operating results.

Additionally, the compromise of our information systems or the information systems of our third party providers and our customers could be compromised, which could lead to unauthorized tampering with our products. Unauthorized tampering may result in, among other things, the disruption of our customers' businesses, errors or defects occurring in the software due to such unauthorized tampering, and our products not operating as expected after such unauthorized tampering. These types of security breaches could also create exposure to lawsuits, regulatory investigations, and increased legal liability. As a provider of secure RTC solutions, the reputational harm of any actual or perceived breach, compromise, defect or error relating to the security of our information systems and the products and services we provide may result in substantial harm to our reputation, even if the legal or regulatory impact is minimal. In addition, the costs to remediate any cyberattack could be significant. Such consequences could be exacerbated if we or our third-party providers are unable to adequately recover critical systems in a timely manner following a systems failure. Our insurance coverage may be insufficient to cover all losses related to cyberattacks.

Worldwide efforts to contain capital spending and global economic conditions and uncertainties in the geopolitical environment have been and may continue to be materially adverse to our business.

One factor that significantly affects our operating results is the impact of economic conditions on the willingness of our current and potential customers to make capital investments. Given the general uncertainty regarding global economic conditions and uncertainties in the geopolitical environment, we believe that customers have tried to maintain or improve profitability through cost control and constrained capital spending, which places additional pressure on IT departments to demonstrate acceptable return on investment. Some of our customers have canceled or delayed, and current and prospective customers may continue to cancel and delay, spending on the development or roll-out of capital and technology projects with us due to economic uncertainty and, consequently, our results of operations have been, and may continue to be, adversely affected. In addition, current uncertain worldwide economic and political environments make it increasingly difficult for us, our customers and our suppliers to accurately forecast future product demand, which could result in an inability to satisfy demand for our products and a loss of market share. Our revenue is likely to decline in such circumstances, which may result in erosion of our profit margins and significant losses.

Moreover, economic conditions worldwide may contribute to slowdowns in the communications and networking industries, as well as to specific segments and markets in which we operate, particularly the wireline sector, resulting in, among other things:

- reduced demand for our products and services as a result of our customers choosing to refrain from building capital intensive networks;
- increased price competition for our products, not only from our competitors, but also as a consequence of customers disposing of unutilized products;
- risk of excess and obsolete inventories;
- excess facilities and manufacturing capacity; and/or
- higher overhead costs as a percentage of revenue and higher interest expense.

Continuing turmoil in the geopolitical environment in many parts of the world, as well as changes implemented by the current U.S. presidential administration, may continue to put pressure on global economic conditions which, in turn, could materially adversely affect our operating results.

Man-made problems, such as terrorism, and natural disasters may disrupt our operations and harm our operating results.

The continued threat of terrorism and heightened security and military action in response to this threat, or any future acts of terrorism, may cause disruptions to the economies of the United States and other countries. Events such as work stoppages or widespread blackouts could have similar negative impacts. Such disruptions or uncertainties could result in delays or cancellations of customer orders or the manufacture or shipment of our products and have a material adverse effect on our business and results of operations.

Natural catastrophic events, such as earthquakes, fire, floods, or tornadoes, may also affect our or our customers' operations. For example, two of our offices are located in the Silicon Valley area of Northern California, a region known for seismic activity. These facilities are located near the San Francisco Bay where the water table is quite close to the surface and where tenants in nearby facilities have experienced water intrusion problems. A significant natural disaster, such as an earthquake or flood, could have a material adverse effect on our business in this location.

If we fail to maintain appropriate internal controls in the future, we may not be able to report our financial results accurately, which may adversely affect our stock price and our business.

Section 404 of the Sarbanes-Oxley Act of 2002 and the related regulations require our management to report on, and our independent registered public accounting firm to attest to, the effectiveness of our internal control over financial reporting. We have committed and will be required to continue to commit significant financial and managerial resources in order to comply with these requirements.

Further, we are required to integrate Edgewater and other acquired businesses into our system of disclosure controls and procedures and internal control over financial reporting. As may be the case with other companies we acquire, prior to the Edgewater Acquisition, Edgewater was not required to implement or maintain the disclosure controls and procedures or internal control over financial reporting that are required of public companies, and we cannot provide assurance as to how long the integration process may take.

Internal control over financial reporting has inherent limitations, including human error, the possibility that controls could be circumvented or become inadequate because of changed conditions, and fraud. If we are unable to maintain effective internal controls, we may not have adequate, accurate or timely financial information, and we may be unable to meet our reporting obligations as a publicly traded company or comply with the requirements of the SEC or the Sarbanes-Oxley Act of 2002. This could result in a restatement of our financial statements, the imposition of sanctions, or investigation by regulatory authorities, and could cause investors to lose confidence in our reported financial information. Any such consequence or other negative effect of our inability to meet our reporting requirements or comply with legal and regulatory requirements, as well as any disclosure of an accounting, reporting or control issue, could adversely affect the trading price of our common stock and our business.

Changes to existing accounting pronouncements or taxation rules or practices may cause adverse fluctuations in our reported results of operations or affect how we conduct our business.

A change in accounting pronouncements or taxation rules or practices can have a significant effect on our reported results and may affect our reporting of transactions completed before the change is effective. New accounting pronouncements, taxation rules and varying interpretations of accounting pronouncements or taxation rules have occurred in the past and may occur in the future. For example, we were required to adopt the new revenue recognition standard in 2018 and have adopted the new lease accounting standard effective January 1, 2019. Any change to existing or any adoption of new accounting pronouncements or taxation rules, or the need for us to modify a current tax position may adversely affect our reported financial results or the way we conduct our business.

If our goodwill or intangible assets become impaired, we may be required to record a significant charge to earnings.

Under generally accepted accounting principles, we review our intangible assets for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Our intangible assets increased by approximately $57 million in 2018 as a result of the Edgewater Acquisition and by approximately $237 million in 2017 as a result of the Merger. Goodwill, which increased by approximately $48 million in 2018 as a result of the Edgewater Acquisition and by approximately $286 million in 2017 as a result of the Merger, is tested for impairment at least annually. Factors that may be considered a change in circumstances indicating that the carrying value of our goodwill or intangible assets may not be recoverable include significant underperformance relative to plan or long-term projections, strategic changes in business strategy, significant negative industry or economic trends, significant change in circumstances relative to a large customer, significant decline in our stock price for a sustained period and decline in our market capitalization to below net book value. Any material impairment of goodwill or intangible assets could adversely affect our results of operations.

Risks Relating to our Intellectual Property

Our business could be jeopardized if we are unable to protect our intellectual property. Additionally, in some jurisdictions, our rights may not be as strong as we currently enjoy in the United States.

We rely on a combination of security countermeasures within our deployed products, as well as patent, copyright, trademark and trade secret laws and contractual restrictions on disclosure to protect our intellectual property rights. Despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy or otherwise misappropriate our products or technology. Monitoring unauthorized use of our products is difficult and we cannot be certain that the steps we have taken will prevent unauthorized use of our technology, particularly in foreign countries where the laws may not protect our proprietary rights as fully as in the United States. The legal systems of many foreign countries do not protect or honor intellectual property rights to the same extent as the legal system of the United States. It may be very difficult, time-consuming and costly for us to attempt to enforce our intellectual property rights, especially in these foreign jurisdictions. If competitors are able to use our technology, our ability to compete effectively could be harmed, which could have a material adverse effect on our business.

Claims that our current or future products infringe or misappropriate the proprietary rights of others could adversely affect our ability to sell those products and cause us to incur additional costs.

Substantial litigation over intellectual property rights exists in the telecommunications industry. For instance, we are involved in six patent infringement lawsuits involving Metaswitch. In five of the six lawsuits, we are the plaintiff and, in three of the lawsuits, we are a counterclaim defendant. In the sixth case, we are the defendant. At this time, it is not possible to predict the outcome of the ongoing lawsuits, including whether or not any proceedings will continue, and when or how these matters will be resolved or whether we will ultimately receive, and in what sum, amounts previously awarded to us as a result of these proceedings.

We expect that we could be increasingly subject to third-party infringement claims as our revenue increases, the number of competitors grows and/or the functionality of products and technology in different industry segments overlaps. Third parties may currently have, or may eventually be issued, patents on which our current or future products or technologies may allegedly infringe. For example, we and our customers have received inquiries from intellectual property owners and may become subject to claims that we or our customers allegedly infringe the intellectual property rights of third parties. If a third party asserts that our products infringe upon their proprietary rights, we may be forced either to defend ourselves, our customers or contract manufacturers in litigation or to license their patents or other intellectual property for substantial royalty payments. These claims and any resulting licensing arrangement or lawsuit could subject us to significant royalty payments or liability for damages and invalidation of our proprietary rights. Any potential intellectual property litigation also could force us to do one or more of the following:

- delay shipments of, or stop selling, incorporating or using our products that use the challenged intellectual property;
- obtain from the owner of the infringed intellectual property right a license to sell or use the relevant technology, which license may not be available at acceptable prices, on acceptable terms, or at all; or
- redesign those products that use any allegedly infringing technology, if feasible.

Patent litigation, regardless of its outcome, will likely result in the expenditure of significant financial resources and the diversion of management's time and resources. In addition, patent litigation may cause negative publicity and adversely impact our ability to gain prospective customers. If a third party's claim of infringement against us in a particular patent litigation is successful, and we could not develop non-infringing technology or license the infringed or similar technology on a timely and cost-effective basis, our revenue may decrease substantially, and we could be exposed to significant liability. A court could enter orders that temporarily, preliminarily or permanently enjoin us or our customers from making, using, selling, offering to sell or importing our current or future products, or could enter an order mandating that we undertake certain remedial activities. In addition, costs relating to indemnification provisions in our product agreements may be significant.

Risks Relating to our International Operations

We may face risks associated with our international expansion that could impair our ability to grow our international revenue. If we fail to manage the operational and financial risks associated with our international operations, it could have a material adverse effect on our business and results of operations.

We have expanded, and expect to continue to expand, our operations in international and emerging markets. International operations are a significant part of our business, and such operations will continue to require significant management attention and financial resources to successfully develop direct and indirect international sales and support channels. In addition, our international operations are subject to other inherent risks, including:

- reliance on channel partners;
- greater difficulty collecting accounts receivable and longer collection cycles;
- difficulties and costs of staffing and managing international operations;
- impacts of differing technical standards outside the United States;
- compliance with international trade, customs and export control regulations;
- reduced protection for intellectual property rights in some countries;
- foreign government regulations limiting or prohibiting potential sales or increasing the cost of doing business in such markets, including adverse tax policies, tariffs, customs regulations, trade protection measures, export quotas and qualifications to transact business;
- differing regulatory requirements, including tax laws, data privacy laws and labor regulations;

- challenging pricing environments in highly competitive new markets;
- foreign currency exchange controls, restrictions on repatriation of cash and changes in currency exchange rates;
- management communication and integration problems related to entering new markets with different languages, cultures and political systems;
- potential exposure to liability or damage of reputation resulting from a higher incidence of corruption or unethical business practices in some countries;
- greater risk of a failure of employees to comply with both U.S. and foreign laws, including antitrust regulations, the U.S. Foreign Corrupt Practices Act ("FCPA") and any trade regulations ensuring fair trade practices;
- higher or more variable network service provider fees outside of the United States;
- any need to adapt and localize our products for specific countries;
- our ability to effectively price our products in competitive international markets;
- potentially adverse tax consequences; and
- political, social and economic instability, including as a result of the fragility of global financial markets, health pandemics or epidemics and/or acts of war or terrorism.

Our international revenue, both as a percentage of total revenue and absolute dollars, may vary from one period to the next, and accordingly, current data may not be indicative of future periods. If we are unable to support our business operations in international and emerging markets, or their further expansion, while balancing the higher operational and financial risks associated with these markets, our business and results of operations could be harmed.

In addition, we may not be able to develop international market demand for our products, which could impair our ability to grow our revenue. In many international markets, long-standing relationships between potential customers and their local suppliers and protective regulations, including local content requirements and approvals, create barriers to entry. We have limited experience marketing, distributing and supporting our products in certain international locations and, to do so, we expect that we will need to develop versions of our products that comply with local standards. Moreover, difficulties in foreign financial markets and economies and of foreign financial institutions, particularly in emerging markets, could adversely affect demand from customers in the affected countries.

Increases in tariffs, trade restrictions or taxes on our products could have an adverse impact on our operations.

We manufacture certain of our appliance products and purchase a portion of our raw materials and components from suppliers in China and other foreign countries. The commerce we conduct in the international marketplace makes us subject to tariffs, trade restrictions and other taxes when the raw materials or components we purchase, and the products we ship, cross international borders. Trade tensions between the United States and China and other countries have been escalating in recent months. Most notably, three rounds of U.S. tariffs were placed on Chinese goods being exported to the United States, with such tariffs taking effect in July, August and September 2018. Each of these U.S. tariff impositions against Chinese exports was followed by a round of retaliatory Chinese tariffs on United States exports to China. In December 2018, the United States and China agreed to a 90-day truce as they attempt to resolve the trade dispute. This window is set to expire on or around March 1, 2019. If the two countries fail to reach an agreement by this date, the tariffs are expected to be reinstated. Certain of the raw materials and components we purchase from China are subject to these tariffs. Although we have not experienced a significant resulting increase in our manufacturing costs, if we were to do so, this eventually could make our products less competitive than those of our competitors whose imports are not subject to these tariffs. In addition, the U.S. administration has threatened to impose tariffs on all products imported from China. If this were to occur, we may not be able to mitigate the impacts of these tariffs and our business, results of operations and financial position could be materially adversely affected. Products we sell into certain foreign markets could also become subject to similar retaliatory tariffs, making the products we sell uncompetitive to similar products not subject to such import tariffs. Further changes in U.S. trade policies, tariffs, taxes, export restrictions or other trade barriers, or restrictions on raw materials or components, may limit our ability to manufacture products, increase our manufacturing costs, decrease our profit margins, reduce the competitiveness of our products, or inhibit our ability to sell products or purchase raw materials or components, which could have a material adverse effect on our business, results of operations and financial condition.

We are exposed to fluctuations in currency exchange rates that could negatively impact our financial results and cash flows.

Because a portion of our business is conducted outside the United States, we face exposure to adverse movements in foreign currency exchange rates. These exposures may change over time as business practices evolve, and they could have a material adverse impact on our financial results and cash flows. An increase in the value of the U.S. dollar could increase the real cost to our customers of our products in those markets outside the United States where we often sell in dollars, and a weakened U.S. dollar could increase the cost of local operating expenses and procurement of raw materials from sources outside the United States. Therefore, changes in the value of the U.S. dollar against other currencies will affect our revenue, income from operations, net income and the value of balance sheet items originally denominated in other currencies. There is no guarantee that our financial results will not be adversely affected by currency exchange rate fluctuations.

Our business and operations in the United Kingdom are exposed to potential disruptions and uncertainty relating to Brexit.

In March 2017, Prime Minister Theresa May of the United Kingdom formally began the process of withdrawing the United Kingdom from the European Union, following the June 2016 referendum in which the majority of voters in the United Kingdom supported such withdrawal (known as Brexit). Brexit could cause disruptions to and create uncertainty surrounding our business and operations in the United Kingdom, including affecting relationships with existing and future customers, suppliers and employees. The effects of Brexit will depend on any agreements the United Kingdom makes to retain access to European Union markets either during a transitional period or more permanently. The measures could potentially disrupt the markets we serve and the tax jurisdictions in which we operate and adversely change tax benefits or liabilities in these or other jurisdictions. In addition, Brexit could lead to legal uncertainty and potentially divergent national laws and regulations as the United Kingdom determines which European Union laws to replace or replicate. These developments in turn may inhibit our sales, mobility of our personnel, and our access to capital. If the United Kingdom and the European Union are unable to negotiate acceptable withdrawal terms or if other Member States pursue withdrawal, barrier-free access between the United Kingdom and other Member States or among the European economic area overall could be diminished or eliminated. Additionally, political instability in the European Union as a result of Brexit may result in a material negative effect on credit markets and foreign direct investments in the European Union and United Kingdom.

Our use and reliance upon research and development resources in India may expose us to unanticipated costs and/or liabilities.

We have two offices in Bangalore, India. The employees at these facilities consist principally of research and development personnel. There is no assurance that our reliance upon development resources in India will enable us to achieve meaningful cost reductions or greater resource efficiency. Further, our development efforts and other operations in India involve significant risks, including:

- difficulty hiring and retaining appropriate engineering and management resources due to intense competition for such resources and resulting wage inflation;
- knowledge transfer related to our technology and resulting exposure to misappropriation of intellectual property or information that is proprietary to us, our customers and other third parties;
- heightened exposure to changes in economic, security and political conditions in India; and
- fluctuations in currency exchange rates and tax compliance in India.

Difficulties resulting from the factors noted above and other risks related to our operations in India could increase our expenses, impair our development efforts, harm our competitive position and damage our reputation.

Risks Relating to Legislation and Government Regulation

Failure to comply with the Foreign Corrupt Practices Act or the U.K. Bribery Act could subject us to significant civil or criminal penalties.

We earn a significant portion of our total revenue from international sales generated through our foreign direct and indirect operations. As a result, we are subject to the FCPA, and the U.K. Bribery Act of 2010 (the "UKBA"), which prohibit bribery in the conduct of business. The FCPA generally prohibits U.S. companies and their intermediaries from making corrupt payments to foreign officials for the purpose of obtaining or keeping business or otherwise obtaining favorable treatment and requires companies to maintain adequate record-keeping and internal accounting practices to accurately reflect the transactions of the company. The FCPA applies to companies, individual directors, officers, employees and agents. The UKBA is much broader and prohibits all bribery, in both the public and private sectors. Although the UKBA does not contain a separate financial records provision, such a requirement is captured under other U.K. legislation. Under the FCPA and the UKBA, U.S. companies, their subsidiaries, employees, senior officers and/or directors may be held liable for actions taken by strategic or local partners or representatives. In addition, the U.S. government or the U.K. government, as applicable, may seek to hold us liable for successor liability violations committed by companies we have acquired or may in the future acquire. If we or our intermediaries fail to comply with the requirements of the FCPA and the UKBA, governmental authorities in the United States and the United Kingdom, as applicable, could seek to impose civil and/or criminal penalties, which could have a material adverse effect on our reputation, results of operations and the trading price of our common stock.

We are subject to governmental export and import controls that could subject us to liability, require a license from the U.S. government or impair our ability to compete in international markets.

Certain of our products incorporating encryption technology are subject to export controls and may be exported only with the required level of export license or through an export license exception. Under these laws and regulations, we are responsible for obtaining all necessary licenses or other approvals, if required, for exports of appliances, software and technology, as well as the provision of service. If we were to fail to comply with export licensing, customs regulations, economic sanctions and other laws, we could be subject to substantial civil and criminal penalties, including fines for the Company and incarceration for responsible employees and managers, and the possible loss of export or import privileges. Similarly, various countries regulate the import of certain encryption technology and have enacted laws that could limit our ability to distribute our products or our customers' ability to implement our products in those countries.

In addition, if our distributors fail to obtain appropriate import, export or re-export licenses or permits, we may also be adversely affected through reputational harm and penalties. Obtaining export licenses can be difficult and time-consuming, and in some cases a license may not be available on a timely basis or at all.

Furthermore, export control laws and economic sanctions prohibit the shipment of certain products to embargoed or sanctioned countries, governments and persons. We cannot assure that a violation of these regulations will not occur, whether knowingly or inadvertently. Any such shipment could have negative consequences including government investigations, penalties, fines, civil and criminal sanctions, and reputational harm.

Additionally, any change in our products or in export or import regulations, economic sanctions or related legislation, shift in approach to the enforcement or scope of existing regulations or change in the countries, persons or technologies targeted by such regulations, could result in delays in the introduction of our products in international markets, decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential customers with international operations. Any decreased use of our products or limitation on our ability to export or sell our products would likely have a material adverse effect on our business and results of operations.

Regulation of the telecommunications industry, or changes in governmental regulation, interpretation or legislative reform could harm our operating results and future prospects.

The telecommunications industry is highly regulated and our business and financial condition could be adversely affected by changes in the regulations relating to the telecommunications industry. Currently, there are few laws or regulations that apply directly to access to or delivery of voice services on IP networks. We could be adversely affected by regulation of IP networks and commerce in any country where we operate, including the United States. Such regulations could include matters such as voice over the Internet or using Internet protocol, encryption technology, and access charges for service providers. The adoption of such regulations could decrease demand for our products, and at the same time increase the cost of selling our products, which could have a material adverse effect on our business and results of operations.

Other laws and regulations, including in the areas of advertising, consumer affairs, data protection, finance, marketing, privacy, publishing and taxation requirements, are subject to change and differing interpretations. Changes in the political climate or in existing laws or regulations, or their interpretations, or the enactment of new laws or the issuance of new regulations or changes in enforcement priorities or activity could adversely affect our business by, among other things, increasing our administrative, compliance and other costs; forcing us to undergo a corporate restructuring; limiting our ability to engage in inter-company transactions with its affiliates and subsidiaries; increasing our tax obligations, including unfavorable outcomes from audits performed by various tax authorities; affecting our ability to continue to serve our customers and to attract new customers; affecting cash management practices and repatriation efforts; forcing us to alter or restructure our relationships with vendors and contractors; increasing compliance efforts or costs; limiting our use of or access to personal information; restricting our ability to market our products; and/or requiring us to implement additional or different programs and systems.

Compliance with regulations is costly and time-consuming, and we may encounter difficulties, delays or significant expenses in connection with compliance, and we may be exposed to significant penalties, liabilities, reputational harm and loss of business in the event that we fail to comply. While it is not possible to predict when or whether fundamental policy or interpretive changes would occur, these or other changes could fundamentally change the dynamics of our industry or the costs associated with our operations. Changes in public policy or enforcement priorities could materially affect our profitability, our ability to retain or grow business, or in the event of extreme circumstances, our financial condition.

Risks Related to our Common Stock

Our stock price has been and may continue to be volatile.

The market for technology stocks has been, and will likely continue to be, volatile. The following factors, among others, could cause the market price of our common stock to fluctuate significantly:

- addition or loss of any major customer;
- continued significant declines in customer spending in the media gateway trunking business;
- decreased spending by customers in the SBC and/or DSC security businesses;
- consolidation among our customers and/or our competitors in the telecommunications industry;
- changes in the financial condition or anticipated capital expenditures of any existing or potential major customer;
- economic conditions for the telecommunications, networking and related industries;
- quarterly variations in our bookings, revenue and operating results;
- failure to meet our earnings guidance or securities analysts' estimates;
- changes in financial estimates by securities analysts;
- speculation in the press or investment community, and shorting of our stock by investors;
- announcements by us or our competitors of significant contracts, new products or acquisitions, distribution partnerships, joint ventures, mergers or capital commitments;
- activism by any single large stockholder or combination of stockholders;
- sales of common stock or other securities by us or by our stockholders, including the OEP Stockholders, in the future;
- securities and other litigation;
- developments with respect to intellectual property rights, including any related litigation;
- repurchases under our stock buyback program;
- departure of key personnel or other major changes in our board of directors or management;
- changes in governmental regulations;
- our ability to develop and market new and enhanced products on a timely basis;
- announcement of a stock split, reverse stock split, stock dividend or similar event; and/or
- emergence or adoption of new technologies or industry standards.

Furthermore, brokerage firms often do not permit stocks trading below $5.00 per share to be sold short, but often permit short-selling of shares which are traded at higher prices. As a result, to the extent our per-share trading price is consistently above $5.00, investors may short our stock. This may increase the volatility of our stock price.

Delaware law and our charter documents contain provisions that could discourage or prevent a potential takeover, even if such a transaction would be beneficial to our stockholders.

Some provisions in our amended and restated certificate of incorporation, our amended and restated by-laws, as well as provisions of Delaware law, may discourage, delay or prevent a merger or acquisition that may be deemed undesirable by our Board of Directors but that a stockholder may consider favorable. These include provisions:

- authorizing the Board of Directors to issue shares of preferred stock;
- limiting the persons who may call special meetings of stockholders;
- prohibiting stockholder actions by written consent;
- permitting the Board of Directors to increase the size of the Board and to fill vacancies;
- providing indemnification to our directors and officers;
- controlling the procedures for conduct and scheduling of Board and stockholder meetings;
- requiring a super-majority vote of our stockholders to amend our amended and restated by-laws and certain provisions of our amended and restated certificate of incorporation; and
- establishing advance notice requirements for nominations for election to the Board of Directors or for proposing matters that can be acted on by stockholders at stockholder meetings.

These provisions, alone or together, could delay hostile takeovers or changes in control of us or our management.

As a Delaware corporation, we are also subject to provisions of Delaware law, including Section 203 of the Delaware General Corporation law, which prevents some stockholders holding more than 15% of our outstanding common stock from engaging in certain business combinations without approval of the holders of substantially all of our outstanding common stock.

Any provision of our amended and restated certificate of incorporation, our amended and restated by-laws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock and could also affect the price that some investors are willing to pay for our common stock. Although we believe that our amended and restated certificate of incorporation, our amended and restated bylaws and provisions of Delaware law provide an opportunity for the Board of Directors to assure that our stockholders realize full value for their investment, they could have the effect of delaying or preventing a change of control that some stockholders may consider beneficial.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

As of December 31, 2018, we maintained the following facilities:

Location	Principal use	Square footage (approximate)	Lease expiration
Plano, Texas	Engineering/development, customer support, general and administrative and sales	100,300	February 2022
Paladium (Ottawa), Canada	Engineering/development, customer support and general and administrative	98,100	December 2029
Westford, Massachusetts	Corporate headquarters, engineering/ development, customer support, general and administrative and sales	97,500	August 2028
Research Triangle Park, North Carolina	Engineering/development, customer support, general and administrative and sales	71,300	April 2027
Bangalore, India	Engineering/development	60,100	October 2019
Durham, North Carolina	Warehouse	50,300	August 2021
San Jose, California	Engineering/development, customer support and sales	37,600	November 2023
Richardson, Texas	Customer testing	26,500	January 2020
Prague, Czech Republic	Customer support	22,600	October 2025
Maidenhead, United Kingdom (a)	Engineering/development, customer support and sales	20,400	July 2020
Bangalore, India	Engineering/development	16,200	June 2019
Fremont, California	Engineering/development and general and administrative	16,000	June 2020
Richardson, Texas (a)	Engineering/development, general and administrative and sales	15,600	September 2021
Freehold, New Jersey	Engineering/development	13,300	January 2024
Mexico City, Mexico	Customer support	11,900	October 2019
Swindon, United Kingdom	Engineering/development and customer support	5,800	March 2019
Galway, Ireland	General and administrative and sales	5,600	January 2023
Rochester, New York (b)	Engineering/development and customer support	5,400	October 2019
New York, New York	General and administrative and sales	5,100	August 2020
Tokyo, Japan	Sales and customer support	5,000	May 2020
Haryana, India	Storage	4,300	Month-to-month
Kuala Lampur, Malaysia	Technical support	4,200	October 2021
Madrid, Spain	Sales and customer support	4,100	September 2019
Montreal (Quebec), Canada	Engineering/development	4,000	November 2020
Immenstaad, Germany	Customer support	4,000	June 30, 2019
Sydney, Australia	Sales and customer support	3,400	October 2021
Schaumberg, Illinois	Engineering/development	2,700	October 2019
Dallas, Texas	Sales and customer support	2,600	April 2021
Gaithersburg, MD	Engineering/development and customer support	2,600	May 2022

(a) A portion of this facility was not in use at December 31, 2018 and is currently being subleased as part of a restructuring initiative.
(b) Facility was not in use at December 31, 2018 as part of a restructuring initiative and is currently being subleased.

We also lease small (under 1,000 square feet) short-term office space in various countries around the world for sales, marketing and services staff. We believe our existing facilities are adequate for our current needs and that suitable additional space will be available as needed.

Item 3. Legal Proceedings

We are involved in six lawsuits with Metaswitch Networks Ltd., Metaswitch Networks Corp. and Metaswitch Inc. (collectively, "Metaswitch"). In five of the lawsuits, we are the plaintiff and, in three of those five lawsuits, we are a counterclaim defendant. In the sixth case, we are the defendant.

On January 21, 2014, GENBAND and our indirectly-owned subsidiary, GENBAND US LLC, filed a complaint in the Eastern District of Texas, Marshall Division, alleging that Metaswitch infringed certain patents owned by GENBAND. Following unsuccessful mediation, a trial took place and on January 15, 2016 the jury awarded approximately $8.2 million in past royalty damages to GENBAND, which neither GENBAND nor we have recorded. On September 29, 2016, the district court confirmed the jury verdict following motions from both parties. On March 22, 2018, the district court entered final judgment awarding GENBAND $8.9 million in royalties for damages through January 15, 2016 at rates set by the district court, excluding pre- and post-judgment interest and costs. On April 10, 2018, the clerk of the district court set the awarded costs at $0.4 million. On April 19, 2018, Metaswitch filed a notice of appeal on the judgment with the United States Court of Appeals for the Federal Circuit, and Metaswitch filed its appeal brief on July 6, 2018. Oral argument on the appeal is set for March 8, 2019.

On April 18, 2018, through Sonus, we filed a complaint in the Eastern District of Texas, Marshall Division, alleging that Metaswitch is continuing to infringe the patents from the first lawsuit above through sales of Metaswitch's allegedly "redesigned" products. This suit seeks a finding that Metaswitch's infringement is willful. This suit also alleges false advertising and seeks monetary damages resulting from allegedly false and misleading statements Metaswitch made regarding the first lawsuit. The district court has set trial for September 9, 2019.

Through Sonus and GENBAND US LLC, we are involved as plaintiff and counterclaim defendant in a lawsuit with Metaswitch regarding claims that Metaswitch misappropriated trade secrets of GENBAND, and we are seeking monetary damages. This case is pending in state court in Dallas County, Texas, and stems from claims originally brought in a patent lawsuit between GENBAND and Metaswitch. The state court action was filed on March 28, 2017. Metaswitch filed its answer on April 21, 2017, in which it asserted counterclaims against GENBAND. On July 11, 2018, Metaswitch filed its fifth amended answer and counterclaims against GENBAND. The Texas state court has set a special setting for a trial for this case on April 22, 2019.

Through Sonus, we are involved as plaintiff and counterclaim defendant in two patent infringement lawsuits with Metaswitch, asserting infringement of a total of ten patents that came into the Company from Sonus, and we are seeking monetary damages. Sonus filed these two lawsuits in the Eastern District of Texas, Marshall Division, on March 8, 2018. Metaswitch filed its answers on May 15, 2018, in which it asserted counterclaims against Sonus, including alleged infringement by the Company and Sonus of a total of ten patents. The district court has set trials for these two cases to occur on February 18, 2020 and June 15, 2020.

On November 9, 2018, Metaswitch filed a complaint against us and several of our subsidiaries in the Southern District of New York alleging various antitrust violations based, in large part, on allegations that GENBAND should not have brought its successful patent infringement lawsuit against Metaswitch. Metaswitch is seeking monetary damages. We have not yet filed an answer, and the court has not yet set a schedule.

At this time, it is not possible to predict the outcome of the litigation matters with Metaswitch, but we do not expect the results of this suit to have a material adverse effect on our business or consolidated financial statements.

On November 8, 2018, Ron Miller, a purported stockholder of ours, filed a Class Action Complaint (the "Miller Complaint") in the United States District Court for the District of Massachusetts (the "Massachusetts District Court") against us and three of our former officers, Raymond P. Dolan, Mark T. Greenquist and Michael Swade (collectively, "the Defendants"), claiming to represent a class of purchasers of Sonus common stock during the period from January 8, 2015 through March 25, 2015 and alleging violations of the federal securities laws. Similar to a previous complaint entitled Sousa et al. vs. Sonus Networks, Inc. et al., which was dismissed with prejudice by Order dated June 6, 2017, the Miller Complaint claims that the Defendants made misleading forward-looking statements concerning Sonus' expected fiscal first quarter of 2015 financial performance, which statements were also the subject of an August 7, 2018 SEC Cease and Desist Order, whose findings we neither admitted nor denied. The Miller plaintiffs are seeking monetary damages.

After the Miller Complaint was filed, several parties filed and briefed motions seeking to be selected by the Massachusetts District Court to serve as a Lead Plaintiff in the action. Briefing on the issue was completed on January 30, 2019 and the Massachusetts District Court is expected to issue a decision shortly. We have not yet filed an answer, and the Massachusetts District Court has not yet set a schedule.

In addition, we are often a party to disputes and legal proceedings that we consider routine and incidental to our business. Management does not expect the results of any of these actions to have a material effect on our business or results of operations.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Effective November 29, 2017, our common stock was quoted on The Nasdaq Global Select Market under the symbol "RBBN." Our common stock began publicly trading on The Nasdaq Global Select Market on October 30, 2017 under the symbol "SONS," following the Merger.

Holders

At February 26, 2019, there were approximately 237 holders of record of our common stock.

Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

The following table summarizes repurchases of our common stock during the fourth quarter of 2018:

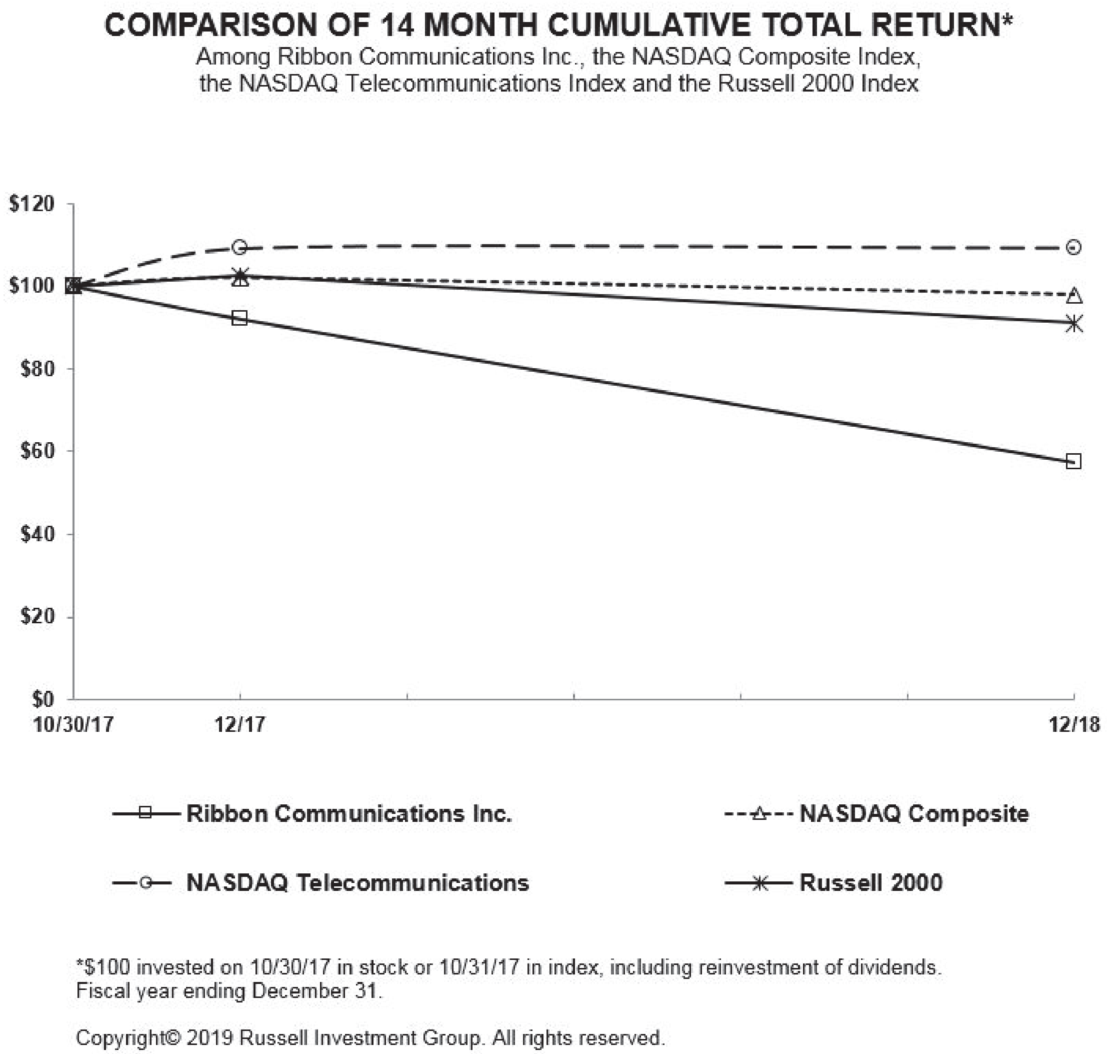
Period	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
October 1, 2018 to October 31, 2018	4,463	$ 6.76	—	$ —
November 1, 2018 to November 30, 2018	96,232	$ 6.12	—	$ —
December 1, 2018 to December 31, 2018	112,348	$ 5.10	—	$ —
Total	213,043	$ 5.60	—	$ —

(1) Upon vesting of restricted stock awards, certain of our employees may return to us a portion of the newly vested shares to satisfy the tax withholding obligations that arise in connection with such vesting. During the fourth quarter of 2018, 213,043 shares of restricted stock were returned to us by employees to satisfy tax withholding obligations arising in connection with vesting of restricted stock, which shares are included in this column.

Performance Graph

The following performance graph compares the cumulative total return to stockholders for our common stock for the period from October 30, 2017 (the date Ribbon's common stock began trading on Nasdaq) through December 31, 2018 with the cumulative total return over the same period on the Nasdaq Composite Index, the Nasdaq Telecommunications Index and the Russell 2000. The Company elected to include the Russell 2000 Index because it believes that such index is more comparable to the Company's specific business. The comparison assumes an investment of $100 on October 30, 2017 in our common stock and in each of the indices and, in each case, assumes reinvestment of all dividends, if any. The performance shown is not necessarily indicative of future performance.

This graph is not deemed to be "filed" with the SEC or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and should not be deemed to be incorporated by reference into any of our prior or subsequent filings under the Securities Act of 1933, as amended, or the Exchange Act.



	October 30, 2017	December 31, 2017	December 31, 2018
Ribbon Communications Inc.	$ 100.00	$ 92.13	$ 57.45
Nasdaq Composite	$ 100.00	$ 101.99	$ 97.95
Nasdaq Telecommunications	$ 100.00	$ 109.13	$ 109.30
Russell 2000	$ 100.00	$ 102.47	$ 91.18

Item 6. Selected Financial Data

On October 27, 2017, (the "Merger Date"), Sonus and GENBAND completed the Merger. The following table presents selected consolidated financial data of Sonus, prior to the Merger Date, and selected consolidated financial data of Ribbon, on and after the Merger Date. The selected consolidated financial data set forth below as of December 31, 2018 and 2017 and for each of the years ended December 31, 2018, 2017 and 2016 have been derived from the audited consolidated financial statements included elsewhere herein. The selected consolidated financial data set forth below as of December 31, 2016, 2015 and 2014 and for each of the years ended December 31, 2015 and 2014 have been derived from audited consolidated financial statements not included elsewhere herein. The following selected consolidated financial data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K.

Consolidated Statement of Operations Data	**Year ended December 31,**				
(In thousands, except per share amounts)	**2018 (1)**	**2017 (2)**	**2016 (3)**	**2015 (4)**	**2014 (5)**
Revenue:					
Product	$ 279,014	$ 181,119	$ 146,381	$ 141,913	$ 182,455
Service	298,891	148,823	106,210	107,121	113,871
Total revenue	577,905	329,942	252,591	249,034	296,326
Cost of revenue:					
Product	142,185	70,250	47,367	50,460	60,284
Service	127,388	58,196	37,613	36,917	42,637
Total cost of revenue	269,573	128,446	84,980	87,377	102,921
Gross profit	308,332	201,496	167,611	161,657	193,405
Operating expenses:					
Research and development	145,462	101,481	72,841	77,908	79,396
Sales and marketing	128,276	83,403	68,539	72,841	80,141
General and administrative	66,036	47,642	35,948	39,846	43,937
Acquisition- and integration-related expense	16,951	14,763	1,152	131	1,558
Restructuring expense	17,015	9,436	2,740	2,148	5,625
Total operating expenses	373,740	256,725	181,220	192,874	210,657
Loss from operations	(65,408)	(55,229)	(13,609)	(31,217)	(17,252)
Interest and other (expense) income, net	(8,002)	1,537	2,193	1,329	2,611
Loss from continuing operations before income taxes	(73,410)	(53,692)	(11,416)	(29,888)	(14,641)
Income tax benefit (provision)	(3,400)	18,440	(2,516)	(2,007)	(2,214)
Net loss	$ (76,810)	$ (35,252)	$ (13,932)	$ (31,895)	$ (16,855)
Loss per share:					
Basic	$ (0.74)	$ (0.60)	$ (0.28)	$ (0.64)	$ (0.34)
Diluted	$ (0.74)	$ (0.60)	$ (0.28)	$ (0.64)	$ (0.34)
Shares used to compute loss per share:					
Basic	103,916	58,822	49,385	49,560	50,245
Diluted	103,916	58,822	49,385	49,560	50,245

(1) Includes $21.5 million of revenue and $4.3 million of net loss attributable to Edgewater for the period subsequent to its acquisition by the Company on August 3, 2018.
(2) Includes $69.1 million of revenue and $12.5 million of net loss attributable to GENBAND for the period subsequent to the Merger on October 27, 2017.
(3) Includes $1.9 million of revenue and $4.7 million of net loss attributable to Taqua, LLC for the period subsequent to its acquisition by the Company on September 26, 2016.
(4) Includes the results of operations of the SDN Business of Treq Labs, Inc. for the period subsequent to its acquisition by the Company on January 2, 2015. The Company has not disclosed the revenue and earnings of the SDN Business for the periods since January 2, 2015, as these amounts are not significant to the Company's consolidated financial statements.

(5) Includes $14.8 million of revenue attributable to Performance Technologies Incorporated for the period subsequent to its acquisition by the Company on February 19, 2014. The impact on earnings is not significant.

Consolidated Balance Sheet Data	December 31,									
(In thousands)	**2018**		**2017**		**2016**		**2015**		**2014**	
Cash and cash equivalents	$	43,694	$	57,073	$	31,923	$	50,111	$	41,157
Marketable securities	$	7,284	$	17,224	$	61,836	$	58,533	$	64,443
Investments	$	—	$	9,031	$	32,371	$	33,605	$	42,407
Total assets	$	957,159	$	910,883	$	308,059	$	312,891	$	332,635
Revolving credit facility	$	55,000	$	20,000	$	—	$	—	$	—
Long-term debt, related party	$	24,100	$	22,500	$	—	$	—	$	—
Other long-term obligations	$	53,107	$	30,160	$	11,868	$	12,416	$	14,878

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Overview

We are a leading provider of next generation ("NextGen") software solutions to telecommunications, wireless and cable service providers and enterprises across industry verticals. With over 1,000 customers around the globe, including some of the largest telecommunications service providers and enterprises in the world, we enable service providers and enterprises to modernize their communications networks through software and provide secure RTC solutions to their customers and employees. By securing and enabling reliable and scalable IP networks, we help service providers and enterprises adopt the next generation of software-based virtualized and cloud communications technologies for service providers to drive new, incremental revenue while protecting their existing revenue streams. Our software solutions provide a secure way for our customers to connect and leverage multivendor, multiprotocol communications systems and applications across their networks and the cloud, around the world and in a rapidly changing ecosystem of IP-enabled devices, such as smartphones and tablets. In addition, our software solutions secure cloud-based delivery of UC solutions - both for service providers transforming to a cloud-based network and for enterprises using cloud-based UC. We sell our software solutions through both direct sales and indirect channels globally, leveraging the assistance of resellers, and we provide ongoing support to our customers through a global services team with experience in design, deployment and maintenance of some of the world's largest software IP networks.

Business Acquisitions

Edgewater Networks, Inc.

On August 3, 2018 (the "Edgewater Acquisition Date"), we completed our acquisition of Edgewater Networks, Inc. ("Edgewater"), a private company headquartered in San Jose, California (the "Edgewater Acquisition"). Edgewater is a market leader in Network Edge Orchestration for the small and medium enterprise and UC market. We believe that the acquisition of Edgewater will allow us to offer our global customer base a complete core-to-edge product portfolio, end-to-end service assurance and analytics solutions, and a fully integrated SD-WAN service.

As consideration for the Edgewater Acquisition, we paid, in the aggregate, approximately $46 million of cash, net of cash acquired, and issued 4.2 million shares of Ribbon common stock to Edgewater's selling shareholders and holders of vested in-the-money options and warrants to acquire common stock of Edgewater (the "Edgewater Selling Stakeholders") on the Edgewater Acquisition Date. The cash payment was funded through our existing credit facility. We had previously agreed to pay the Edgewater Selling Stakeholders an additional $30 million of cash, $15 million of which was to be paid six months from the Edgewater Acquisition Date and the other $15 million of which was to be paid as early as nine months from the Edgewater Acquisition Date and no later than 18 months from the Edgewater Acquisition Date (the exact timing of which would depend on the amount of revenue generated from the sales of Edgewater products in 2018) (the "Edgewater Deferred Consideration"). On February 15, 2019, we and the Edgewater Selling Stakeholders agreed to reduce the amount of Edgewater Deferred Consideration from $30 million to $21.9 million and agreed that all such deferred consideration will be payable on March 8, 2019.

The Edgewater Acquisition has been accounted for as a business combination and the financial results of Edgewater have been included in our consolidated financial statements for the period subsequent to the Edgewater Acquisition Date.

GENBAND

On October 27, 2017 (the "Merger Date"), Sonus Networks, Inc. ("Sonus") consummated an acquisition as specified in an Agreement and Plan of Merger (the “Merger Agreement”) with Solstice Sapphire Investments, Inc. ("NewCo") and certain of its wholly-owned subsidiaries, GENBAND Holdings Company, GENBAND Inc. and GENBAND II, INC. (collectively, "GENBAND") such that, following a series of mergers (collectively, the "Merger"), Sonus and GENBAND each became a wholly-owned subsidiary of NewCo.

As a result of the Merger, we believe we are better positioned to enable network transformations to IP and to cloud-based networks for service providers and enterprise customers worldwide, with a broader and deeper sales footprint, increased ability to invest in growth, more efficient and effective research and development, and a comprehensive RTC product offering.

Pursuant to the Merger Agreement, NewCo issued 50.9 million shares to the GENBAND equity holders, with the number of shares issued in the aggregate to the GENBAND equity holders equal to the number of shares of Sonus common stock outstanding immediately prior to the closing date of the Merger, such that former stockholders of Sonus would own approximately 50%, and former shareholders of GENBAND and the two related holding companies would own approximately 50%, of the shares of NewCo common stock issued and outstanding immediately following the consummation of the Merger.

The Merger has been accounted for as a business combination and the financial results of GENBAND have been included in our consolidated financial statements beginning on the Merger Date. On November 28, 2017, the Company changed its name to "Ribbon Communications Inc."

Taqua, LLC

On September 26, 2016 (the "Taqua Acquisition Date"), we acquired Taqua, LLC ("Taqua"), a leading supplier of IP communications systems, applications and services to mobile and fixed operators. Taqua enables the transformation of software-based service provider networks to deliver next-generation voice, video and messaging services, including VoIP, VoWiFi and VoLTE. The financial results of Taqua are included in our consolidated financial statements beginning on the Taqua Acquisition Date.

Anova Data, Inc.

On February 28, 2019, we acquired the business and technology assets of Anova Data, Inc. ("Anova"), a provider of advanced analytics solutions, for total purchase consideration of 3.3 million shares of our common stock. Anova is based in the U.S., and its NextGen products provide a cloud-native, streaming analytics platform for network and subscriber optimization and monetization. We believe that the proposed acquisition reinforces and extends our strategy to expand into network optimization, security and data monetization via big data analytics and machine learning. We do not expect that the acquisition will have a material effect on our consolidated financial statements in 2019.

Financial Overview

Financial Results

We reported losses from operations of approximately $65 million for 2018, $55 million for 2017 and $14 million for 2016. We reported net losses of approximately $77 million for 2018, $35 million for 2017 and $14 million for 2016.

Our revenue was approximately $578 million in 2018, $330 million in 2017 and $253 million in 2016. Our gross profit was approximately $308 million in 2018, $201 million in 2017 and $168 million in 2016. Our gross profit as a percentage of revenue ("total gross margin") was approximately 53% in 2018, 61% in 2017 and 66% in 2016.

Our operating expenses were approximately $374 million in 2018, compared to approximately $257 million in 2017 and approximately $181 million in 2016.

Our 2018 operating expenses included approximately $17 million of acquisition- and integration-related expenses, primarily related to the Merger and, to a lesser extent, to the recent acquisition of Edgewater, and approximately $17 million of restructuring expense, primarily related to severance and related costs.

Our 2017 operating expenses included approximately $15 million of acquisition- and integration-related expenses, nearly all related to the Merger, and approximately $9 million of restructuring expense. Our 2017 restructuring expense was primarily related to severance and related costs.

Our 2016 operating expenses included approximately $1 million of acquisition- and integration-related costs for professional and services fees related to our acquisition of Taqua and approximately $3 million of restructuring expense. Our 2016 restructuring expense was primarily related to severance and related costs.

We recorded stock-based compensation expense of approximately $11 million in 2018, $26 million in 2017 and $20 million in 2016. The expense recorded in 2017 includes approximately $9 million of incremental expense related to the acceleration of stock options and certain full value stock awards in connection with the Merger.

See "Results of Operations" in this Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") for additional discussion of our results of operations for the years ended December 31, 2018, 2017 and 2016.

Restructuring and Cost Reduction Initiatives

In connection with the Merger, we implemented a restructuring plan in the fourth quarter of 2017 to eliminate certain redundant positions and facilities within the combined companies (the "Merger Restructuring Initiative"). We recorded approximately $16 million of restructuring expense related to the Merger Restructuring Initiative in 2018, comprised of approximately $15 million for severance and related expenses and approximately $1 million in connection with redundant facilities located in the Czech Republic, Canada and the U.S. We recorded approximately $9 million of restructuring expense for severance and related expenses in 2017 related to the Merger Restructuring Initiative. We anticipate that we will record additional future expense in connection with this initiative for headcount and redundant facilities aggregating approximately $5 million. We believe that the severance payments currently accrued will be completed in 2019 and that the payments related to redundant facilities will be completed in 2029, when the last of the leases for these restructured facilities expires. We are actively seeking to sublease each of these facilities.

We assumed GENBAND's restructuring liability aggregating approximately $4 million at the Merger Date (the "GENBAND Restructuring Initiative"), primarily related to headcount reductions. In 2018, we recorded approximately $1 million of restructuring expense for changes in estimated costs for previously recorded initiatives, primarily changes in negotiated severance to employees in certain international locations and changes in estimated sublease income for restructured facilities. We do not expect to record additional expense in connection with this initiative except for adjustments for changes in estimated costs. We believe that the payments will be completed in 2020, when the lease for this restructured facility expires.

On July 25, 2016, we announced a program (the "2016 Restructuring Initiative") to further accelerate our investment in new technologies as the communications industry migrates to a cloud-based architecture and pursues new strategic initiatives, such as new products and an expanded go-to-market footprint in selected geographies and discrete vertical markets. We have recorded an aggregate of approximately $2 million of restructuring expense in connection with this initiative, primarily for severance and related costs. The amounts accrued for severance and related costs were fully paid in 2017. We expect that the amounts accrued for facilities will be paid by the end of 2019.

In connection with the acquisition of Taqua, we implemented a restructuring plan in the third quarter of 2016 to eliminate certain redundant positions within the combined companies. On October 24, 2016, the Audit Committee of our Board of Directors (the "Audit Committee") approved a broader Taqua restructuring plan related to headcount and redundant facilities (collectively, the "Taqua Restructuring Initiative"). In connection with this initiative, we have recorded approximately $2 million of restructuring expense for severance and related costs and estimated costs related to the elimination of redundant facilities, including adjustments recorded for changes in cost estimates for the planned restructuring activities. The actions under the Taqua Restructuring Initiative have been implemented and accordingly, we do not expect to record additional expense in connection with this initiative. The amounts accrued for severance and related costs were fully paid by the end of the third quarter of 2017. We expect that the amounts accrued for facilities costs will be paid in 2019.

Critical Accounting Policies and Estimates

Management's discussion and analysis of the financial condition and results of operations is based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosure of contingent assets and liabilities. We base our estimates and judgments on historical experience, knowledge of current conditions and beliefs of what could occur in the future given available information. We consider the following accounting policies to be both those most important to the portrayal of our financial condition and those that require the most subjective judgment. If actual results differ significantly from management's estimates and projections, there could be a material effect on our consolidated financial statements. The significant accounting policies that we believe are the most critical include revenue recognition, the valuation of inventory, loss contingencies and reserves, stock-based compensation, business combinations, goodwill and intangible assets, and accounting for income taxes.

Revenue Recognition. We account for revenue in accordance with Accounting Standards Codification ("ASC") 606, *Revenue from Contracts with Customers* ("ASC 606"), which we adopted on January 1, 2018 using the modified retrospective method.

We derive revenue from two primary sources: products (software and non-software products) and services. Software and non-software product revenue is generated from sales of our software with proprietary appliances that function together to deliver the products' essential functionality. Software and appliances are also sold on a standalone basis. Services include customer support (software updates and technical support), consulting, design services, installation services and training. A typical contract includes both product and services. Generally, contracts with customers contain multiple performance obligations. For these contracts, we account for individual performance obligations separately if they are distinct. The transaction price is allocated to the separate performance obligations on a relative standalone selling price basis. SSPs are typically estimated based on observable transactions when these services are sold on a standalone basis.

The software licenses typically provide a perpetual right to use our software. We also sell term-based software licenses that expire and Software-as-as-Service ("SaaS")-based software which are referred to as subscription arrangements. We do not customize our software nor are installation services required, as the customer has a right to utilize internal resources or a third-party service company. The software and appliances are delivered before related services are provided and are functional without professional services or customer support. We have concluded that our software licenses are functional intellectual property that are distinct, as the user can benefit from the software on its own. The product revenue is typically recognized upon transfer of control or when the software is made available for download, as this is the point that the user of the software can direct the use of, and obtain substantially all of the remaining benefits from, the functional intellectual property. We do not recognize software revenue related to the renewal of subscription software licenses earlier than the beginning of the subscription period. Appliance products are generally sold with software to provide the customer solution.

Service revenue includes revenue from customer support and other professional services. We offer warranties on our products. Certain of our warranties are considered to be assurance-type in nature and do not cover anything beyond ensuring that the product is functioning as intended. Based on the guidance in ASC 606, assurance-type warranties do not represent separate performance obligations. We also sell separately-priced maintenance service contracts which qualify as service-type warranties and represent separate performance obligations. We do not allow and have no history of accepting product returns.

Customer support includes software updates on a when-and-if-available basis, telephone support, integrated web-based support and bug fixes or patches. We sell our customer support contracts at a percentage of list or net product price related to the support. Customer support revenue is recognized ratably over the term of the customer support agreement, which is typically one year.

Our professional services include consulting, technical support, resident engineer services, design services and installation services. Because control transfers over time, revenue is recognized based on progress toward completion of the performance obligation. The method to measure progress toward completion requires judgment and is based on the nature of the products or services to be provided. We generally use the input method to measure progress for our contracts because we believe it best depicts the transfer of assets to the customer which occurs as we incur costs for the contracts. Under the cost-to-cost measure of progress, the progress toward completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. When the measure of progress is based upon expended labor, progress toward completion is measured as the ratio of labor time expended to date versus the total estimated labor time required to complete the performance obligation. Revenue is recorded proportionally as costs are incurred or as labor is expended. Costs to fulfill these obligations include internal labor as well as subcontractor costs.

We offer customer training courses, for which the related revenue is typically recognized as the training services are performed.

Our contracts with customers often include promises to transfer multiple products and services to the customer. Determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together may require significant judgment.

Judgment is required to determine the SSP for each distinct performance obligation. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we determine the SSP using information that may include market conditions and other observable inputs. We typically have more than one SSP for individual products and services due to the stratification of those products and services by customers and circumstances. In these instances, the Company may use information such as the size of the customer and geographic region in determining the SSP.

Valuation of Inventory. We review inventory for both potential obsolescence and potential loss of value periodically. In this review, we make assumptions about the future demand for and market value of the inventory and, based on these assumptions, estimate the amount of any excess, obsolete or slow-moving inventory.

We write down our inventories if they are considered to be obsolete or at levels in excess of forecasted demand. In these cases, inventory is written down to estimated realizable value based on historical usage and expected demand. Inherent in our estimates of market value in determining inventory valuation are estimates related to economic trends, future demand for our products and technical obsolescence of our products. If future demand or market conditions are less favorable than our

projections, additional inventory write-downs could be required and would be reflected in the cost of revenue in the period the revision is made. To date, we have not been required to revise any of our assumptions or estimates used in determining our inventory valuations.

We write down our evaluation equipment at the time of shipment to our customers, as it is not probable that the inventory value will be realizable.

Loss Contingencies and Reserves. We are subject to ongoing business risks arising in the ordinary course of business that affect the estimation process of the carrying value of assets, the recording of liabilities and the possibility of various loss contingencies. An estimated loss contingency is accrued when it is probable that a liability has been incurred or an asset has been impaired and the amount of loss can be reasonably estimated. We regularly evaluate current information available to determine whether such amounts should be adjusted and record changes in estimates in the period they become known. We are subject to various legal claims. We reserve for legal contingencies and legal fees when the amounts are probable and reasonably estimable.

Stock-Based Compensation. Our stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as expense over the requisite service period, which is generally the vesting period.

We use the Black-Scholes valuation model for estimating the fair value on the date of grant of employee stock options. Determining the fair value of stock option awards at the grant date requires judgment regarding certain valuation assumptions, including the volatility of our stock price, expected term of the option, risk-free interest rate and expected dividends. Changes in such assumptions and estimates could result in different fair values and could therefore impact our earnings. Such changes, however, would not impact our cash flows. The fair value of restricted stock awards, restricted stock units and performance-based awards is based upon our stock price on the grant date.

We grant performance-based stock units, some of which include a market condition, to certain of our executives. We use a Monte Carlo simulation approach to model future stock price movements based upon the risk-free rate of return, the volatility of each entity, and the pair-wise covariance between each entity. These results are then used to calculate the grant date fair values of the performance-based stock units.

The amount of stock-based compensation expense recorded in any period for unvested awards requires estimates of the amount of stock-based awards that are expected to be forfeited prior to vesting, as well as assumptions regarding the probability that performance-based stock awards without market conditions will be earned.

Business Combinations. We allocate the purchase price of acquired companies to identifiable assets acquired and liabilities assumed at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred over the net of the acquisition date fair values of the assets acquired and the liabilities assumed and represents the expected future economic benefits arising from other assets acquired in the business combination that are not individually identified and separately recognized. Significant management judgments and assumptions are required in determining the fair value of assets acquired and liabilities assumed, particularly acquired intangible assets which are principally based upon estimates of the future performance and cash flows expected from the acquired business and applied discount rates. While we use our best estimates and assumptions as part of the purchase price allocation process to accurately value assets acquired and liabilities assumed at a business combination date, our estimates and assumptions are inherently uncertain and subject to refinement. If different assumptions are used, it could materially impact the purchase price allocation and our financial position and results of operations. Any adjustments to assets acquired or liabilities assumed subsequent to the purchase price allocation period are included in operating results in the period in which the adjustments are determined. Intangible assets typically are comprised of in-process research and development, developed technology, customer relationships, trade names and internal use software.

Goodwill and Intangible Assets. Goodwill is not amortized, but instead is tested for impairment annually, or more frequently if indicators of potential impairment exist. Intangible assets with estimated lives and other long-lived assets are reviewed for impairment when events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of intangible assets with estimated lives and other long-lived assets is measured by comparing the carrying amount of the asset to future net undiscounted pretax cash flows expected to be generated by the asset. If these comparisons indicate that an asset is not recoverable, we will recognize an impairment loss for the amount by which the carrying value of the asset exceeds the related estimated fair value.

Judgment is required in determining whether an event has occurred that may impair the value of goodwill or identifiable intangible or other long-lived assets. Factors that could indicate an impairment may exist include significant underperformance relative to plan or long-term projections, strategic changes in business strategy, significant negative industry or economic trends, a significant change in circumstances relative to a large customer, a significant decline in our stock price for a sustained period and a decline in our market capitalization to below net book value. We must make assumptions about future control premiums, market comparables, cash flows, operating plans, discount rates and other factors to determine recoverability.

Our annual testing for impairment of goodwill is completed as of November 30. We operate as a single operating segment with one reporting unit and consequently we evaluate goodwill for impairment based on an evaluation of the fair value of the Company as a whole. We performed our step one assessments for each of the years ended December 31, 2018, 2017 and 2016 and determined each year that our fair value was in excess of our carrying value and accordingly, there was no impairment of goodwill. At certain times during 2018, including at our annual testing date of November 30, 2018, our market capitalization was below our book value. While we have concluded that the fair value exceeds carrying value at that date, we regularly monitor for changes in circumstances, including changes to our projections regarding performance of the business, that could result in impairment of goodwill.

Accounting for Income Taxes. Our provision for income taxes is comprised of a current and a deferred portion. The current income tax provision is calculated as the estimated taxes payable or refundable on tax returns for 2018. We provide for deferred income taxes resulting from temporary differences between financial and taxable income. Such differences arise primarily from tax net operating loss ("NOL") and credit carryforwards, depreciation, deferred revenue, stock-based compensation expense, accruals and reserves.

We assess the recoverability of any tax assets recorded on the balance sheet and provide any necessary valuation allowances as required. In evaluating our ability to recover our deferred tax assets, we consider all available positive and negative evidence including our past operating results, the existence of cumulative income in the most recent years, changes in the business in which we operate and our forecast of future taxable income. In determining future taxable income, we are responsible for assumptions utilized, including the amount of state, federal and international pre-tax operating income, the reversal of temporary differences and the implementation of feasible and prudent tax planning strategies. These assumptions require significant judgment about the forecasts of future taxable income and are consistent with the plans and estimates we are using to manage our underlying businesses. Such assessment is completed on a jurisdiction by jurisdiction basis.

At December 31, 2018, we had valuation allowances of approximately $82 million to offset net domestic deferred tax assets of approximately $83 million. In addition, we had valuation allowances to offset Canada federal credits carryovers of approximately $10 million and Ireland net deferred tax assets of $10 million. In the event we determine it is more likely than not that we will be able to use a deferred tax asset in the future in excess of its net carrying value, the valuation allowance would be reduced, thereby increasing net earnings and increasing equity in the period such determination is made. We have recorded net deferred tax assets in some of our international subsidiaries. These amounts could change in future periods based upon our operating results and changes in tax law.

We provide for income taxes during interim periods based on the estimated effective tax rate for the full year. We record a cumulative adjustment to the tax provision in an interim period in which a change in the estimated annual effective tax rate is determined.

We have provided for income taxes on the undistributed earnings of our non-U.S. subsidiaries as of December 31, 2018, with the exception of the Company's Irish subsidiary, as we do not plan to permanently reinvest these amounts outside the U.S. The repatriation of the undistributed earnings would result in withholding taxes imposed on the repatriation. Consequently, we have recorded a tax liability of $4.5 million, consisting of potential withholding and distribution taxes related to undistributed earnings from these subsidiaries as of December 31, 2018. Had the earnings of the Irish subsidiary been determined to not be permanently reinvested outside the U.S., no additional deferred tax liability would be required due to no withholding taxes or income tax expense being imposed on such repatriation.

We assess all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and we will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of recognized tax benefit is still appropriate. The recognition and measurement of tax benefits require significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act"). The Tax Act makes broad and complex changes to the U.S. tax code, including, but not limited to: reducing the U.S. federal corporate tax rate from 35% to 21%; requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries; generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; requiring a current inclusion in U.S. federal taxable income of certain earnings (Global Intangible Low-taxed Income) ("GILTI") of controlled foreign corporations; eliminating the corporate alternative minimum tax ("AMT") and changing how existing AMT credits can be realized; creating the base erosion anti-abuse tax; creating a new limitation on deductible interest expense; changing rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017; providing a tax deduction for foreign-derived intangible income; and changing rules related to deductibility of compensation for certain officers.

We completed our accounting for the effects of the Tax Act in the fourth quarter of 2018 and the effects of the Tax Act were reflected in in our 2018 tax provision. We considered the impact of the Base Erosion and Anti-Abuse Tax ("BEAT"), the GILTI, the deduction for foreign derived intangible income and other provisions of the Tax Act when preparing our 2018 tax provision. Based on this analysis, we recorded BEAT tax expense of $0.4 million in 2018 and recorded an adjustment to the provisional amounts previously recorded related to the Tax Act that decreased our deferred tax assets by $0.2 million.

Results of Operations

Years Ended December 31, 2018 and 2017

Revenue. Revenue for the years ended December 31, 2018 and 2017 was as follows (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2018	2017	$	%
Product	$ 279.0	$ 181.1	$ 97.9	54.1%
Service	298.9	148.8	150.1	100.8%
Total revenue	$ 577.9	$ 329.9	$ 248.0	75.2%

Our product revenue is generated from sales of software with attached appliances, software licenses and software subscription fees. Certain of our products may be included in more than one of our solutions (session solutions, network transformation solutions, and applications and security solutions), dependent upon the configuration of the individual customer solutions sold. Our software with attached appliances and software license revenues are primarily comprised of our media gateway, call controller, signaling, virtual mobile core and management (i.e., analytics, assurance, billing, etc.) products. Our software subscription fees revenue is primarily comprised of sales of our UC-related (i.e., application server, media server, etc.), Kandy Cloud and Ribbon Protect products. All three of our solutions portfolios address both the service provider and enterprise markets and are sold through both our direct sales program and from indirect sales through our channel partner program.

Our product revenue increased in 2018 compared to 2017 primarily due to the inclusion of GENBAND's product revenue for the full year in 2018 compared to the inclusion of two months of GENBAND's product revenue in 2017. Product revenue from sales of our software with attached appliances and software licenses contributed approximately $85 million in the aggregate to the increase in our product revenue in 2018, coupled with approximately $13 million of higher 2018 product revenue from sales of our software subscriptions.

In 2018, approximately 21% of our product revenue was attributable to sales to enterprise customers, compared to approximately 20% in 2017. These sales were made through both our direct sales team and indirect sales channel partners.

In 2018, approximately 25% of our product revenue was from indirect sales through our channel partner program, compared to approximately 24% in 2017.

The timing of the completion of customer projects and revenue recognition criteria satisfaction may cause our product revenue to fluctuate from one period to the next.

Service revenue is primarily comprised of appliance and software maintenance and support (“maintenance revenue”) and network design, installation and other professional services (“professional services revenue”).

Service revenue for the years ended December 31, 2018 and 2017 was comprised of the following (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2018	2017	$	%
Maintenance	$ 234.0	$ 114.7	$ 119.3	103.9%
Professional services	64.9	34.1	30.8	90.5%
Total service revenue	$ 298.9	$ 148.8	$ 150.1	100.8%

Our maintenance revenue increased in 2018 compared to 2017 primarily due to the inclusion of GENBAND maintenance revenue for the full year in 2018 compared to the inclusion of two months of GENBAND maintenance revenue in 2017.

The increase in our professional services revenue in 2018 compared to 2017 was primarily due to the inclusion of GENBAND professional services revenue for the full year in 2018 compared to the inclusion of two months of GENBAND professional services revenue in 2017.

The following customer contributed 10% or more of our revenue in the years ended December 31, 2018 and 2017:

	Year ended December 31,	
	2018	2017
Verizon Communications Inc.	17%	17%

Revenue earned from customers domiciled outside the United States was approximately 42% of revenue in 2018 and approximately 34% of revenue in 2017. Due to the timing of project completions, we expect that the domestic and international components as a percentage of our revenue may fluctuate from quarter to quarter and year to year.

Our deferred product revenue was approximately $14 million at December 31, 2018 and approximately $22 million at December 31, 2017. Our deferred service revenue was approximately $108 million at December 31, 2018 and approximately $93 million at December 31, 2017. Our deferred revenue balance may fluctuate as a result of the timing of revenue recognition, customer payments, maintenance contract renewals, contractual billing rights and maintenance revenue deferrals included in multiple element arrangements.

We expect that our product revenue in 2019 will increase compared with 2018 levels, primarily due to the inclusion of revenue attributable to our acquisition of Edgewater.

We expect that our service revenue in 2019 will increase compared with 2018 levels, primarily due to the inclusion of revenue attributable to our acquisition of Edgewater and the continued organic growth of our installed customer base. However, we expect to continue to encounter ongoing industry pricing pressure, third-party competition and legacy network product decommissioning.

Overall, we expect that total revenue in 2019 will increase compared with our 2018 total revenue, primarily due to the inclusion of revenue attributable to our acquisition of Edgewater.

In connection with the purchase price allocation to record our acquisition of GENBAND, we were required to record at fair value the assumed deferred revenue, resulting in a reduction of approximately $50 million to the assumed deferred revenue and future recognizable revenue. We recognized approximately $22 million less revenue in 2018 and expect to recognize approximately $7 million less revenue in 2019 than GENBAND would have recognized in the same period had we not acquired it. Our purchase price allocation to record our acquisition of Edgewater resulted in a reduction of approximately $4 million to the assumed deferred revenue and future recognizable revenue. We recognized approximately $2 million less revenue in the period of 2018 following the Edgewater Acquisition Date than Edgewater would have recognized in the same period had we not acquired it. We expect that these purchase accounting-related reductions to future revenue will continue through 2020, primarily related to future maintenance revenue.

Cost of Revenue/Gross Margin. Our cost of revenue consists primarily of amounts paid to third-party manufacturers for purchased materials and services, royalties and manufacturing and services personnel and related costs. Our cost of revenue and gross margins for the years ended December 31, 2018 and 2017 were as follows (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2018	2017	$	%
Cost of revenue				
Product	$ 142.2	$ 70.2	$ 72.0	102.4%
Service	127.4	58.2	69.2	118.9%
Total cost of revenue	$ 269.6	$ 128.4	$ 141.2	109.9%
Gross margin				
Product	49.0%	61.2%		
Service	57.4%	60.9%		
Total gross margin	53.4%	61.1%		

The decrease in product gross margin in 2018 compared to 2017 was primarily due to the inclusion of GENBAND product costs for the full year in 2018 compared to the inclusion of two months of GENBAND product costs in 2017, including the amortization of intangible assets arising from the Merger, which decreased our product gross margin by approximately six percentage points, coupled with product and customer mix, which also decreased our product gross margin by approximately six percentage points.

The decrease in service gross margin in 2018 compared to 2017 was primarily due to the inclusion of GENBAND service costs for the full year in 2018 compared to the inclusion of two months of GENBAND service costs in 2017, coupled with higher project-related service costs, each of which decreased our service gross margin by approximately two percentage points. Although service revenue increased by approximately $150 million in 2018 compared to 2017, the increase in service costs of approximately $69 million contributed to the decline in gross margin. Our service cost of revenue is relatively fixed in advance of any particular quarter and therefore, changes in service revenue will typically have a significant impact on service gross margins.

Our purchases of materials and components for manufacture increased in 2018 compared with 2017 due to the inclusion of GENBAND's operations since October 27, 2017 in our consolidated results. We expect our future purchases of materials and components to decrease as a result of the increase in software content of our products both in absolute terms and as a percentage of our revenue.

We believe that our total gross margin will increase in 2019, primarily due to the expected higher software content as a percentage of our total revenue, coupled with the impact of our restructuring and integration cost reduction initiatives.

Research and Development Expenses. Research and development expenses consist primarily of salaries and related personnel expenses and prototype costs for the design, development, testing and enhancement of our products. Research and development expenses for the years ended December 31, 2018 and 2017 were as follows (in millions, except percentages):

Year ended December 31,		Increase from prior year	
2018	2017	$	%
$ 145.5	$ 101.5	$ 44.0	43.3%

The increase in research and development expenses in 2018 compared to 2017 was attributable to approximately $18 million of higher employee-related expenses, approximately $14 million of higher product development expense (i.e., third-party development, prototype and test equipment costs) and approximately $12 million of higher infrastructure-related expense. The increase in employee-related expenses was primarily attributable to approximately $23 million of higher salary and related expenses, including our company-wide cash bonus program, partially offset by approximately $5 million of lower stock-based compensation expense. These increases were primarily attributable to the inclusion of GENBAND research and development expenses for the full year in 2018 compared to the inclusion of two months of GENBAND research and development expenses in 2017, partially offset by the cost reductions realized from our recent restructuring initiatives. Our research and development expenses in 2018 also included approximately $5 million of expense attributable to Edgewater since the Edgewater Acquisition Date, primarily for employee- and infrastructure-related expenses.

Some aspects of our research and development efforts require significant short-term expenditures, the timing of which may cause significant variability in our expenses. We believe that rapid technological innovation is critical to our long-term success, and we are tailoring our investments to meet the requirements of our customers and market. We believe that our research and development expenses in 2019 will increase from 2018 levels due to our continued increased investment in our software solutions and the impact of Edgewater's research and development expenses for the full year 2019, partially offset by savings from our ongoing restructuring and integration cost savings initiatives.

Sales and Marketing Expenses. Sales and marketing expenses consist primarily of salaries and related personnel costs, commissions, travel and entertainment expenses, promotions, customer trial and evaluations inventory and other marketing and sales support expenses. Sales and marketing expenses for the years ended December 31, 2018 and 2017 were as follows (in millions, except percentages):

Year ended December 31, 2018	Year ended December 31, 2017	Increase from prior year $	Increase from prior year %
$ 128.3	$ 83.4	$ 44.9	53.8%

The increase in sales and marketing expenses in 2018 compared to 2017 was primarily attributable to approximately $32 million of higher employee-related expenses, approximately $6 million of higher amortization of acquired intangible assets and approximately $6 million of higher infrastructure-related expenses. The increase in employee-related expenses was primarily attributable to $28 million of higher salary and commissions and related expenses, including our company-wide cash bonus program, and approximately $6 million of higher employee travel and training and related expenses, partially offset by approximately $2 million of lower stock-based compensation expense. These increases were primarily attributable to the inclusion of GENBAND sales and marketing expenses for the full year in 2018 compared to the inclusion of two months of GENBAND sales and marketing expenses in 2017, partially offset by the cost reductions realized from our recent restructuring initiatives. Our sales and marketing expenses in 2018 also included approximately $5 million of expense attributable to Edgewater for the period since the Edgewater Acquisition Date, primarily for employee- and infrastructure-related expenses.

We believe that our sales and marketing expenses will be essentially flat in 2019 compared with 2018, as we expect the inclusion of Edgewater's sales and marketing expenses for the full year 2019 will be offset by cost savings from our ongoing restructuring and integration cost savings initiatives.

General and Administrative Expenses. General and administrative expenses consist primarily of salaries and related personnel costs for executive and administrative personnel, and audit, legal and other professional fees. General and administrative expenses for the years ended December 31, 2018 and 2017 were as follows (in millions, except percentages):

Year ended December 31, 2018	Year ended December 31, 2017	Increase from prior year $	Increase from prior year %
$ 66.0	$ 47.6	$ 18.4	38.6%

The increase in 2018 general and administrative expenses was primarily attributable to approximately $11 million of higher professional fees (i.e., legal, audit and outside services), approximately $4 million of higher employee-related expenses, approximately $2 million of higher infrastructure-related expenses and approximately $1 million of net increases in other general and administrative expenses. The increase in our professional fees included approximately $8 million of fees related to ongoing litigation with one of our competitors and approximately $1 million of fees related to our planned convertible senior notes offering that we subsequently elected not to proceed with, as we believed that then-current market conditions were not conducive for an offering on terms that would be in the best interests of our stockholders. The increase in our employee-related expenses was primarily attributable to approximately $9 million of higher salary and related expenses, including expense in connection with our company-wide cash bonus program, partially offset by approximately $6 million of lower stock-based compensation expense. These increases were primarily attributable to the inclusion of GENBAND general and administrative expenses for the full year in 2018 compared to the inclusion of two months of GENBAND general and administrative expenses in 2017, partially offset by the cost reductions realized from our recent restructuring initiatives. Our general and administrative expenses in 2018 also included approximately $1 million of expense attributable to Edgewater, primarily for professional fees and employee- and infrastructure-related expenses.

We believe that our general and administrative expenses will decrease in 2019 compared with 2018, primarily due to savings from our restructuring and integration cost savings initiatives.

Acquisition- and Integration-Related Expenses. Acquisition- and integration-related expenses include those expenses related to acquisitions that we would otherwise not have incurred. Acquisition-related expenses include professional and services fees, such as legal, audit, consulting, paying agent and other fees, and expenses related to cash payments to certain former executives of the acquired businesses in connection with their employment agreements. Integration-related expenses represent incremental costs related to combining the Company's systems and processes with those of acquired businesses,

such as third-party consulting and other third-party services. We recorded approximately $17 million of acquisition- and integration-related expenses in 2018, comprised of $10 million of acquisition-related expenses and approximately $7 million of integration-related expenses. The acquisition-related expense primarily related to the Merger, with nominal amounts related to the acquisition of Edgewater and other acquisition-related activities. We recorded approximately $15 million of acquisition- and integration-related expenses in 2017, comprised of approximately $13 million of acquisition-related expense and approximately $2 million of integration-related expense. The acquisition-related expense was comprised of approximately $12 million for professional services fees and $1 million related to cash payments to certain former GENBAND executives. We estimate that we will incur additional integration-related expense in 2019 approximating $3 million.

Acquisition- and integration-related expenses are reported separately in the consolidated statements of operations.

Restructuring Expense. We have been committed to streamlining operations and reducing operating costs by closing and consolidating certain facilities and reducing our worldwide workforce. Please see the additional discussion of our restructuring initiatives in the "Restructuring and Cost Reduction Initiatives" section of the Overview of this Management's Discussion and Analysis of Financial Condition and Results of Operations.

We recorded restructuring expense of approximately $17 million in 2018, comprised of approximately $16 million in connection with our Merger Restructuring Initiative and approximately $1 million for changes in estimated costs in connection with our assumption of GENBAND's restructuring liability at the time of Merger.

We recorded net restructuring expense of approximately $9 million in 2017, comprised of approximately $9 million in connection with our Merger Restructuring Initiative, less than $1 million in connection with our Taqua Restructuring Initiative and less than $1 million in connection with our 2016 Restructuring Initiative. The net restructuring expense recorded included reversals for changes in estimated costs totaling less than $1 million in the aggregate in connection with the GENBAND Restructuring Initiative, the Taqua Restructuring Initiative and the 2016 Restructuring Initiative.

Although we have eliminated positions as part of our restructuring initiatives, we continue to hire in certain areas that we believe are important to our future growth. Restructuring expense is reported separately in the consolidated statements of operations.

Interest (Expense) Income, net. Interest expense and interest income for the years ended December 31, 2018 and 2017 were as follows (in millions, except percentages):

	Year ended December 31, 2018	Year ended December 31, 2017	Increase (decrease) from prior year $	Increase (decrease) from prior year %
Interest income	$ 0.3	$ 1.0	$ (0.7)	(69.4)%
Interest expense	(4.5)	(0.7)	3.8	573.0 %
Interest (expense) income, net	$ (4.2)	$ 0.3	$ (4.5)	(1,708.4)%

Interest expense in both 2018 and 2017 was primarily comprised of interest on the related party promissory note issued in connection with the Merger, the outstanding revolving credit facility balance, the amortization of debt issuance costs in connection with our revolving credit facilities and interest on capital lease obligations. Interest income consisted of interest earned on our cash equivalents, marketable securities and investments. The higher interest expense in 2018 compared with 2017 was primarily due to the promissory note and credit facility balances outstanding for the full year 2018, compared to approximately two months in 2017. The decrease in interest income in 2018 compared with 2017 was primarily due to the lower amounts available for investment in 2018.

Other (Expense) Income, Net. Other expense, net, in 2018 of approximately $4 million was primarily comprised of foreign currency losses. Other income, net, in 2017 of approximately $1 million was primarily comprised of the gain on the sale of an intangible asset and foreign currency gains.

Income Taxes. We recorded an income tax provision of approximately $3 million in 2018 and a benefit for income taxes of approximately $18 million in 2017. The provision recorded in 2018 was primarily the result of foreign operations. The benefit recorded in 2017 was primarily the result of the release of an approximately $16 million domestic valuation allowance as a result of net deferred tax liabilities acquired as part of the GENBAND acquisition.

During 2018 and 2017, we performed an analysis to determine if, based on all available evidence, we considered it more likely than not that some portion or all of the recorded deferred tax assets will not be realized in a future period. As a result of our evaluations, we concluded that there was insufficient positive evidence to overcome the more objective negative evidence related to our cumulative losses and other factors. Accordingly, we maintained a valuation against our domestic deferred tax asset. A similar analysis and conclusion were made with regard to the valuation allowance on the deferred tax assets of our Irish subsidiary. In analyzing the deferred tax assets related to our Canada subsidiaries, we concluded that it was more likely than not that the Canadian federal credits would not be realized in a future period.

Years Ended December 31, 2017 and 2016

Revenue. Revenue for the years ended December 31, 2017 and 2016 was as follows (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2017	2016	$	%
Product	$ 181.1	$ 146.4	$ 34.7	23.7%
Service	148.8	106.2	42.6	40.1%
Total revenue	$ 329.9	$ 252.6	$ 77.3	30.6%

The increase in product revenue in 2017 compared to 2016 was primarily the result of the inclusion of GENBAND's product revenue for the period following the Merger Date. Revenue from sales of our software with attached appliances and software licenses contributed approximately $32 million in the aggregate to the increase in product revenue in 2017, coupled with approximately $3 million of higher 2017 product revenue from sales of our software subscriptions.

In 2017, approximately 24% of our product revenue was from indirect sales through our channel partner program, compared to approximately 26% in 2016.

In 2017, approximately 20% of our product revenue was attributable to sales to enterprise customers, compared to approximately 19% in 2016. These sales were made through both our direct sales team and indirect sales channel partners.

Service revenue for the years ended December 31, 2017 and 2016 was comprised of the following (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2017	2016	$	%
Maintenance	$ 114.7	$ 87.0	$ 27.7	31.9%
Professional services	34.1	19.2	14.9	77.4%
Total service revenue	$ 148.8	$ 106.2	$ 42.6	40.1%

Our maintenance revenue increased in 2017 compared to 2016 primarily due to the inclusion of approximately $21 million of revenue attributable to GENBAND in 2017 for the period following the Merger Date and the inclusion of approximately $5 million of revenue attributable to Taqua.

The increase in our professional services revenue in 2017 compared to 2016 was primarily due to the inclusion of approximately $10 million of revenue attributable to GENBAND in 2017 for the period following the Merger Date, coupled with an increase in the volume of network transformation solutions projects completed in 2017 compared to 2016.

The following customers each contributed 10% or more of our revenue in at least one of the years ended December 31, 2017 and 2016:

	Year ended December 31,	
	2017	2016
Verizon Communications Inc.	17%	*
AT&T Inc.	*	12%

Revenue earned from customers domiciled outside the United States was approximately 34% of total revenue in 2017 and approximately 31% of revenue in 2016.

Our deferred product revenue was approximately $22 million at December 31, 2017 and approximately $7 million at December 31, 2016. Our deferred service revenue was approximately $93 million at December 31, 2017 and approximately $44 million at December 31, 2016.

Cost of Revenue/Gross Margin. Cost of revenue and gross margins for the years ended December 31, 2017 and 2016 were as follows (in millions, except percentages):

	Year ended December 31,		Increase from prior year	
	2017	2016	$	%
Cost of revenue				
Product	$ 70.2	$ 47.4	$ 22.8	48.3%
Service	58.2	37.6	20.6	54.7%
Total cost of revenue	$ 128.4	$ 85.0	$ 43.4	51.1%
Gross margin				
Product	61.2%	67.6%		
Service	60.9%	64.6%		
Total gross margin	61.1%	66.4%		

The decrease in product gross margin in 2017 compared to 2016 was primarily due to the inclusion of GENBAND for the period following the Merger Date, which decreased our product gross margin by approximately seven percentage points, and impairment expense of approximately $6 million related to the write-off of one of our previously acquired developed technology intangible assets, which decreased our product gross margin by approximately four percentage points. These decreases were partially offset by the impact of our product and customer mix, particularly sales of certain of our security and applications products, which increased our product gross margin by approximately five percentage points in 2017.

The decrease in service gross margin in 2017 compared to 2016 was primarily due to the inclusion of GENBAND expenses for the period following the Merger Date, which decreased our service gross margin by approximately four percentage points. Although service revenue increased by approximately $43 million in 2017 compared to 2016, the increase in service costs of approximately $21 million contributed to the decline in gross margin. Our service cost of revenue is relatively fixed in advance of any particular quarter and therefore, changes in service revenue will typically have a significant impact on service gross margins.

Research and Development Expenses. Research and development expenses for the years ended December 31, 2017 and 2016 were as follows (in millions, except percentages):

Year ended December 31,		Increase from prior year	
2017	2016	$	%
$ 101.5	$ 72.8	$ 28.7	39.3%

The increase in research and development expenses in 2017 compared to 2016 was attributable to approximately $19 million of higher employee-related expenses, approximately $7 million of higher product development expense, approximately $2 million of higher infrastructure-related expense and approximately $1 million of net increases in other research and development costs. The increase in employee-related expenses was attributable to approximately $14 million of higher salary and related expenses, approximately $2 million of higher stock-based compensation expense and approximately $3 million of higher combined expense in connection with our company-wide bonus program and employee travel, training and related expenses. Our 2017 research and development expenses included approximately $17 million of expense attributable to GENBAND, primarily comprised of approximately $9 million of employee-related expenses, approximately $5 million of product development costs, approximately $1 million of depreciation expense and approximately $1 million of infrastructure expense.

Sales and Marketing Expenses. Sales and marketing expenses for the years ended December 31, 2017 and 2016 were as follows (in millions, except percentages):

Year ended December 31,		Increase from prior year	
2017	2016	$	%
$ 83.4	$ 68.5	$ 14.9	21.7%

The increase in sales and marketing expenses in 2017 compared to 2016 was primarily attributable to the inclusion of GENBAND's expenses, aggregating approximately $14 million, for the 2017 period following the Merger Date, primarily comprised of approximately $10 million of employee-related expenses, $3 million of amortization of acquired intangible assets and $2 million of infrastructure-related expense.

General and Administrative Expenses. General and administrative expenses for the years ended December 31, 2017 and 2016 were as follows (in millions, except percentages):

Year ended December 31, 2017	Year ended December 31, 2016	Increase from prior year $	Increase from prior year %
$ 47.6	$ 35.9	$ 11.7	32.5%

Our 2017 general and administrative expenses included approximately $5 million of expense attributable to GENBAND for the period following the Merger Date. The increase in general and administrative expenses in 2017 compared to 2016 was attributable to approximately $10 million of higher employee-related expenses, approximately $3 million of higher professional fees and approximately $2 million of expense accrued for potential fines in connection with the then-ongoing SEC investigation. These increases were partially offset by approximately $3 million of lower infrastructure costs.

Acquisition- and Integration-Related Expenses. We recorded approximately $15 million of acquisition- and integration-related expenses in the year ended December 31, 2017, comprised of approximately $13 million of acquisition-related expense and approximately $2 million of integration-related expense. The acquisition-related expense was comprised of approximately $12 million for professional services fees and $1 million related to cash payments to certain former GENBAND executives. We recorded approximately $1 million of acquisition-related expenses in 2016 in connection with the acquisition of Taqua.

Restructuring Expense. We recorded net restructuring expense of approximately $9 million in 2017, comprised of approximately $9 million in connection with our Merger Restructuring Initiative, less than $1 million in connection with our Taqua Restructuring Initiative and less than $1 million in connection with our 2016 Restructuring Initiative, net of reversals for changes in estimated costs totaling less than $1 million in the aggregate in connection with the GENBAND Restructuring Initiative, the Taqua Restructuring Initiative and the 2016 Restructuring Initiative. We recorded restructuring expense aggregating approximately $3 million in 2016, primarily for severance and related costs, comprised of approximately $2 million under our 2016 Restructuring Initiative and approximately $1 million related to our Taqua Restructuring Initiative.

Interest Income, net. Interest income and interest expense for the years ended December 31, 2017 and 2016 were as follows (in millions, except percentages):

	Year ended December 31, 2017	Year ended December 31, 2016	Increase (decrease) from prior year $	Increase (decrease) from prior year %
Interest income	$ 1.0	$ 0.9	$ 0.1	7.9 %
Interest expense	(0.7)	(0.1)	0.6	591.8 %
Interest income, net	$ 0.3	$ 0.8	$ (0.5)	(65.8)%

Interest income consisted of interest earned on our cash equivalents, marketable securities and investments. Interest expense in 2017 was primarily comprised of interest on the outstanding revolving credit facility balance assumed in connection with the acquisition of GENBAND, amortization of debt issuance costs in connection with our revolving credit facilities and interest on capital lease obligations. Interest expense in 2016 was comprised of expense related to the amortization of debt issuance costs in connection with our revolving credit facility and expense related to interest on capital lease obligations.

Other Income, Net. Other income, net, in 2017 of approximately $1 million was primarily comprised of the gain on the sale of an intangible asset and foreign currency gains. Other income, net, in 2016 of approximately $1 million was primarily comprised of gains from the sale of intangible assets.

Income Taxes. We recorded a benefit for income taxes of approximately $18 million in 2017 and a provision for income taxes of approximately $3 million in 2016. The benefit recorded in 2017 was primarily the result of the release of an approximately $16 million domestic valuation allowance as a result of net deferred tax liabilities acquired as part of the GENBAND acquisition. The expense recorded in 2016 was primarily related to foreign operations. During 2017 and 2016,

we performed an analysis to determine if, based on all available evidence, we considered it more likely than not that some portion or all of the recorded deferred tax assets will not be realized in a future period. As a result of our evaluations, we concluded that there was insufficient positive evidence to overcome the more objective negative evidence related to our cumulative losses and other factors. Accordingly, we maintained a valuation against our domestic deferred tax asset. A similar analysis and conclusion were made with regard to the valuation allowance on the deferred tax assets of our Irish subsidiary. In analyzing the deferred tax assets related to our Canada subsidiaries, we concluded that it was more likely than not that the Canadian federal SRED credits would not be realized in a future period.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements that have or are reasonably likely to have a current or future material effect on our financial position, changes in financial position, revenue or expenses, results of operations, liquidity, capital expenditures or capital resources.

Liquidity and Capital Resources

Our consolidated statements of cash flows are summarized as follows (in millions):

Year ended December 31, 2018 compared to year ended December 31, 2017	Year ended December 31, 2018	Year ended December 31, 2017	Change
Net loss	$ (76.8)	$ (35.2)	$ (41.6)
Adjustments to reconcile net loss to cash flows (used in) provided by operating activities	77.1	35.0	42.1
Changes in operating assets and liabilities	(9.9)	8.3	(18.2)
Net cash (used in) provided by operating activities	$ (9.6)	$ 8.1	$ (17.7)
Net cash (used in) provided by investing activities	$ (35.4)	$ 21.0	$ (56.4)
Net cash provided by (used in) financing activities	$ 31.8	$ (4.5)	$ 36.3

Year ended December 31, 2017 compared to year ended December 31, 2016	Year ended December 31, 2017	Year ended December 31, 2016	Change
Net loss	$ (35.2)	$ (13.9)	$ (21.3)
Adjustments to reconcile net loss to cash flows provided by (used in) operating activities	35.0	35.0	—
Changes in operating assets and liabilities	8.3	(1.9)	10.2
Net cash provided by operating activities	$ 8.1	$ 19.2	$ (11.1)
Net cash provided by (used in) investing activities	$ 21.0	$ (27.3)	$ 48.3
Net cash used in financing activities	$ (4.5)	$ (9.9)	$ 5.4

Our cash, cash equivalents and short- and long-term investments totaled approximately $51 million at December 31, 2018 and $83 million at December 31, 2017. We had cash held by our non-U.S. subsidiaries aggregating approximately $11 million at December 31, 2018 and $14 million at December 31, 2017. If we elect to repatriate all of the funds held by our non-U.S. subsidiaries as of December 31, 2018, we do not believe that the amounts of potential withholding taxes that would arise from the repatriation would have a material effect on our liquidity.

On November 13, 2018, we announced that we intended to offer, subject to market conditions and other factors, $150 million aggregate principal amount of convertible senior notes due 2023 in a private offering to qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended. We expected to grant the initial purchasers a 30-day option to purchase up to an additional $25 million aggregate principal amount of such notes, solely to cover over-allotments, if any. On that same day, we decided not to proceed with our previously-announced offering and consequently did not sell any securities as part of such offering. We believed that then-current market conditions were not conducive for an offering on terms that would be in the best interests of our stockholders. In connection with this offering, we incurred $1 million of expense, primarily for professional fees, which is included as a component of General and administrative expense in our consolidated statement of operations for the year ended December 31, 2018.

On the Merger Date and in connection with the Merger, we assumed GENBAND's Senior Secured Credit Agreement (the "Prior Credit Agreement") with Silicon Valley Bank ("SVB"), which had outstanding borrowings and letters of credit totaling approximately $18 million and $3 million, respectively, and an average interest rate of 4.67%. GENBAND had entered into the Prior Credit Agreement with SVB effective July 1, 2016. The Prior Credit Agreement had a maturity date of July 1, 2019 and provided for revolving loans, including letters of credit and swingline loans, not to exceed $50 million in total, with potential further increases of up to $75 million available for a total revolving line of credit of up to $125 million. The Prior Credit Agreement was superseded by a Senior Secured Credit Agreement, as amended, which was entered into on December 21, 2017 and is discussed below.

On December 21, 2017, we entered into a Senior Secured Credit Agreement (as amended, the "Credit Facility") with SVB, which refinanced the Prior Credit Agreement. The Credit Facility includes $100 million of commitments, the full amount of which is available for revolving loans, a $15 million sublimit that is available for letters of credit and a $15 million sublimit that is available for swingline loans. The Credit Facility is scheduled to mature in December 2021, subject to a springing maturity if, on or before July 14, 2020, the existing promissory note issued to certain shareholders is not converted or extended to March 2022 or later. The Credit Facility contains procedures for additional financial institutions to become lenders, or for any existing lender to increase its commitment under the facility, subject to an available increase of $50 million for all incremental commitments under the Credit Facility without amendment. On June 24, 2018, we amended the Credit Facility to, among other things, permit the Edgewater Acquisition and related transactions.

The indebtedness and other obligations under the Credit Facility are unconditionally guaranteed on a senior secured basis by us and each of our other material U.S. domestic subsidiaries (collectively, the "Guarantors"). The Credit Agreement is secured by first-priority liens on substantially all of our assets.

The Credit Facility requires periodic interest payments on outstanding borrowings until maturity. We may prepay all revolving loans under the Credit Facility at any time without premium or penalty (other than customary LIBOR breakage costs), subject to certain notice requirements.

Revolving loans under the Credit Facility bear interest at our option at either the Eurodollar (LIBOR) rate plus a margin ranging from 2.50% to 3.00% per year or the base rate (the highest of the Federal Funds rate plus 0.50%, or the prime rate announced from time to time in The Wall Street Journal) plus a margin ranging from 1.50% to 2.00% per year (such margins being referred to as the "Applicable Margin"). The Applicable Margin varies depending on our consolidated leverage ratio (as defined in the Credit Agreement). The base rate and the LIBOR rate are each subject to a zero percent floor.

We are charged a commitment fee ranging from 0.25% to 0.40% per year on the daily amount of the unused portions of the commitments under the Credit Facility. Additionally, with respect to all letters of credit outstanding under the Credit Facility, we are charged a fronting fee of 0.125% per year and an outstanding letter of credit fee equal to the Applicable Margin for base rate loans ranging from 1.50% to 2.00% times the amount of the outstanding letters of credit.

The Credit Facility requires compliance with certain financial covenants, including a minimum consolidated quick ratio, minimum consolidated interest coverage ratio and maximum consolidated leverage ratio, all of which are defined in the Credit Agreement and tested on a quarterly basis. In addition, the Credit Facility contains various covenants that, among other restrictions, limit our and our subsidiaries' ability to enter into certain types of transactions, including, but not limited to: incurring or assuming indebtedness, making acquisitions or engaging in mergers, making investments, repurchasing equity and paying dividends, selling or otherwise transferring assets, changing the nature of our business and amending or making prepayments on certain junior debt. We were in compliance with all covenants of the Credit Facility at December 31, 2018 and 2017.

The Credit Facility contains events of default that are customary for a secured credit facility. If an event of default relating to bankruptcy or other insolvency events with respect to a borrower occurs, all obligations under the Credit Facility will immediately become due and payable. If any other event of default exists under the Credit Facility, the lenders may accelerate the maturity of the obligations outstanding under the Credit Facility and exercise other rights and remedies, including charging a default rate of interest equal to 2.00% per year above the rate that would otherwise be applicable. In addition, if any event of default exists under the Credit Facility, the lenders may commence foreclosure or other actions against the collateral.

If any default exists under the Credit Facility, or if the Borrower is unable to make any of the representations and warranties as stated in the Credit Agreement at the applicable time, the Borrower will be unable to borrow funds or have letters of credit issued under the Credit Facility, which, depending on the circumstances prevailing at that time, could have a material adverse effect on the Borrower's liquidity and working capital.

On December 21, 2017, concurrently with the completion of the Credit Facility, we repaid in full all outstanding amounts under the Prior Credit Agreement and terminated the agreement. We did not incur any early termination penalties in connection with the termination of the Prior Credit Agreement.

At December 31, 2018, we had an outstanding debt balance of $55 million at a weighted average interest rate of 5.96% and approximately $3 million of outstanding letters of credit at an interest rate of 1.75% under the Credit Facility. At December 31, 2017, we had an outstanding debt balance of $20 million at an interest rate of 4.51% and approximately $3 million of outstanding letters of credit at an interest rate of 2.00% under the Credit Facility.

In connection with the Merger, on October 27, 2017, we issued a promissory note for approximately $23 million to certain of GENBAND's equity holders (the "Promissory Note"). The Promissory Note does not amortize and the principal thereon is payable in full on the third anniversary of its execution. Interest on the promissory note is payable quarterly in arrears and accrued at a rate of 7.5% per year for the first six months after issuance, and thereafter at a rate of 10% per year. The failure to make any payment under the Promissory Note when due and, with respect to payment of any interest, the continuation of such failure for a period of thirty days thereafter, constitutes an event of default under the Promissory Note. If an event of default occurs under the Promissory Note, the payees may declare the entire balance of the Promissory Note due and payable (including principal and accrued and unpaid interest) within five business days of the payees' notification to the Company of such acceleration. Interest that is not paid on the interest payment date will increase the principal amount of the Promissory Note. At December 31, 2018, the Promissory Note balance was $24.1 million, comprised of $22.5 million of principal plus $1.6 million of interest converted to principal.

Sonus maintained a credit facility by and among Sonus, as Borrower, Bank of America, N.A. ("Bank of America"), as Administrative Agent, Swing Line Lender and L/C Issuer, and the other lenders from time to time party thereto entered into on June 27, 2014 (as amended, the "Sonus Credit Agreement"). The Sonus Credit Agreement expired by its terms on June 30, 2017 and was not renewed.

Our operating activities used approximately $10 million of cash in 2018 and provided approximately $8 million of cash in 2017 and $19 million of cash in 2016.

Cash used in operating activities in 2018 was primarily the result of lower accrued expenses and other long-term liabilities and accounts payable, coupled with higher accounts receivable and other operating assets. These were partially offset by higher deferred revenue, lower inventory, and the net impact of non-cash items against our net loss. The decrease in accrued expenses and other long-term liabilities is primarily related to lower accruals for taxes and professional fees. The decrease in accounts payable relates to the timing and amounts of purchases of both services and tangible goods and their related payment arrangements. The increase in accounts receivable primarily relates to the Edgewater Acquisition. Deferred revenue balances may fluctuate as a result of the timing of invoicing and revenue recognition. Our net loss, adjusted for non-cash items such as depreciation, amortization, stock-based compensation, deferred income taxes and other non-cash items, including foreign currency exchange losses, was virtually break-even.

Cash provided by operating activities in 2017 was primarily the result of higher deferred revenue and accounts payable, coupled with decreases in inventory and other operating assets. These were partially offset by higher accounts receivable and lower accrued expenses and other long-term liabilities, plus the impact of our net loss, adjusted for non-cash items. The increase in accounts payable relates to the timing of purchases of both services and tangible goods and their related payment arrangements. The increase in accounts receivable primarily relates to higher revenue in 2017 compared to 2016, partially offset by our continued focus on our collection efforts. Our net loss, adjusted for non-cash items such as depreciation, amortization, stock-based compensation, impairment of intangible assets and deferred income taxes, was virtually break-even.

Cash provided by operating activities in 2016 was primarily the result of decreases in inventory and other operating assets and higher deferred revenue, partially offset by lower accrued expenses and accounts payable, higher accounts receivable and our net loss. The decrease in accrued expenses primarily relates to lower accruals in connection with our Company-wide cash bonus program, for which we changed the timing of bonus payments in 2016 such that a portion of the bonus was paid in August 2016 based on our results against certain internal goals for the first half of the year. Bonuses for the remainder of 2016 were paid in early 2017 based on our results for the second half of 2016. The increase in accounts receivable primarily relates to higher revenue in 2016 compared to 2015, partially offset by the results of our continued focus on our collection efforts. Our net loss, adjusted for non-cash items such as depreciation, amortization, stock-based compensation and deferred income taxes, provided approximately $21 million of cash.

Our investing activities used approximately $35 million of cash in 2018, provided approximately $21 million of cash in 2017 and used approximately $27 million of cash in 2016. In 2018, we used approximately $46 million to pay the cash consideration for the Edgewater Acquisition and approximately $8 million to purchase property and equipment, partially offset by approximately $19 million of sales and maturities of our investments in marketable securities. In 2017, net sales of our investments in marketable securities provided approximately $67 million of cash, of which we used approximately $43 million to pay the cash consideration for GENBAND. We used approximately $4 million to purchase property and equipment. In 2016, we used approximately $21 million of cash, net of cash acquired, for business acquisitions, approximately $5 million of cash for the purchase of property and equipment, and approximately $3 million for net investments in marketable securities. The amount used for business acquisitions was comprised of $20 million, net of cash acquired, for the acquisition of Taqua, and slightly under $1 million paid as the final consideration installment for a previous acquisition.

Our financing activities provided approximately $32 million of cash in 2018 and used approximately $4 million of cash in 2017 and $10 million in 2016. The 2018 amount was primarily comprised of approximately $35 million of net borrowings against our Credit Facility, partially offset by approximately $2 million used to pay withholding obligations related to the net share settlement of restricted and performance-based stock grants upon vesting and approximately $1 million in the aggregate used to make principal payments on our capital lease obligations and debt issuance costs related to our Credit Facility. The 2017 amount was primarily comprised of approximately $8 million used to pay withholding obligations related to the net share settlement of restricted and performance-based stock grants upon vesting and $1 million to pay debt issuance costs related to our Credit Facility, partially offset by approximately $2 million of net borrowings against our Credit Facility, $1 million of proceeds from the sale of our common stock in connection with our Amended and Restated 2000 Employee Stock Purchase Plan, as amended, and approximately $1 million of proceeds from the exercise of stock options. The 2016 amount was primarily comprised of approximately $10 million used for the repurchase of common stock under our stock buyback program.

Contractual Obligations

Our contractual obligations at December 31, 2018 consisted of the following (in millions):

	Payments due by period				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Capital lease obligations	$ 2.3	$ 1.0	$ 1.3	$ —	$ —
Operating lease obligations *	57.4	10.7	15.8	11.1	19.8
Purchase obligations	40.4	37.8	2.6	—	—
Restructuring severance obligations	1.9	1.9	—	—	—
Debt obligations - principal **	79.1	—	24.1	55.0	—
Employee postretirement defined benefit plans	7.0	0.1	0.1	0.3	6.5
Uncertain tax positions ***	4.1	4.1	—	—	—
	$ 192.2	$ 55.6	$ 43.9	$ 66.4	$ 26.3

* Includes restructuring payments aggregating approximately $1 million, approximately 50% of which is due in less than one year and the remainder is due in one to three years. Excludes current estimated sublease income aggregating approximately $125,000 over the remaining lease terms of the restructured facilities.

** Debt obligations - principal represents both our Promissory Note payable of $24.1 million and the outstanding balance on our Credit Facility of $55.0 million at December 31, 2018. We periodically make payments and borrow on the revolving credit facility, and accordingly, we have included it in current liabilities in our consolidated balance sheet. However, we have reported the outstanding balance payment due in the table above in the "3-5 years" column based solely on the expiration date of the Credit Facility.

*** This liability is not subject to fixed payment terms and the amount and timing of payments, if any, that we will make related to this liability are not known. See Note 19 to our consolidated financial statements appearing in this Annual Report on Form 10-K for additional information.

Based on our current expectations, we believe our current cash, cash equivalents, marketable securities and available borrowings under the Credit Agreement will be sufficient to meet our anticipated cash needs for working capital and capital expenditures for at least twelve months. However, we cannot be sure that our current cash, cash equivalents, marketable securities and available borrowings under our credit facility will be sufficient to meet our future needs. If we are unable to generate sufficient cash flows in the future, and if availability under our credit facility is not sufficient to support our

operations, we may need to refinance our debt or obtain additional financing. We may not be able to refinance our debt or obtain additional financing on favorable terms or at all.

The rate at which we will consume cash will be dependent on the cash needs of future operations, including changes in working capital, which will, in turn, be directly affected by the levels of demand for our products, the timing and rate of expansion of our business, the resources we devote to developing our products and any litigation settlements. We anticipate devoting substantial capital resources to continue our research and development efforts, to maintain our sales, support and marketing, to complete merger-related integration activities and for other general corporate activities. However, it is difficult to predict future liquidity requirements with certainty. See Note 22 to our consolidated financial statements for a description of our other contingencies.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2014-09, its new standard on revenue from contracts with customers, along with additional ASUs which, among other things, clarified the implementation of the new revenue guidance and delayed the adoption by one year, to January 1, 2018 (the "New Revenue Standard"). The New Revenue Standard outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that an entity recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. In applying the revenue model to contracts within its scope, an entity identifies the contract(s) with a customer, identifies the performance obligations in the contract, determines the transaction price, allocates the transaction price to the performance obligations in the contract and recognizes revenue when (or as) the entity satisfies a performance obligation. Effective January 1, 2018, we adopted the New Revenue Standard using the modified retrospective option and have identified the necessary changes to our policies, processes, systems and controls. Under the modified retrospective method, we are applying the New Revenue Standard to all contracts not yet completed as of January 1, 2018, recognizing in beginning Accumulated deficit an adjustment for the cumulative effect of the change and providing additional disclosures comparing results to those as if we were still following the previous accounting standards. Under ASC 605, we concluded we did not have VSOE for certain elements in software bundled arrangements, which resulted in revenue being recognized ratably over the longest performance period. The majority of the transition adjustments related to these arrangements. In connection with the adoption of ASC 606, as of January 1, 2018, the Company recorded an adjustment to decrease Accumulated deficit by approximately $12 million and capitalized certain commission costs resulting directly from securing contracts which were previously expensed.

In May 2017, the FASB issued ASU 2017-09, *Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting* ("ASU 2017-09"), which amends the scope of modification accounting for share-based payment arrangements such that an entity would not apply modification accounting if the fair value, vesting conditions and classification of the awards are the same immediately before and after the modification. ASU 2017-09 became effective for us beginning January 1, 2018 for both interim and annual reporting periods. The adoption of ASU 2017-09 did not have a material impact on our condensed consolidated financial statements.

In March 2017, the FASB issued ASU 2017-07, *Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post Retirement Benefit Cost* ("ASU 2017-07"). ASU 2017-07 amends the requirements in ASC 715, *Compensation - Retirement Benefits* ("ASC 715") to require entities to disaggregate the current-service-cost component from the other components of net benefit cost (the "other components") and include it with other current compensation costs for related employees, present the other components elsewhere in the income statement and outside of income from operations if such a subtotal is presented and disclose the income statement lines that contain the other components if they are not presented on appropriately described separate lines. ASU 2017-07 became effective for us beginning January 1, 2018 for both interim and annual reporting periods. The adoption of ASU 2017-07 did not have a material impact on our condensed consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), which adds or clarifies guidance on eight cash flow issues, including debt prepayment or debt extinguishment costs, settlement of zero-coupon debt instruments or certain other debt instruments, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies, distributions received from equity method investees, beneficial interests in securitization transactions and separately identifiable cash flows and application of the predominance principle. ASU 2016-15 became effective for us beginning January 1, 2018 for both interim and annual reporting periods.

Entities must apply the guidance retrospectively to all periods presented but may apply it prospectively from the earliest date practicable if retrospective application would be impracticable. The adoption of ASU 2016-15 did not have a material impact on our condensed consolidated financial statements.

In August 2018, the FASB issued ASU 2018-15, *Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* ("ASU 2018-15"), which provides guidance on implementation costs incurred in a cloud computing arrangement ("CCA") that is a service contract. ASU 2018-15 amends ASC 350, Intangibles - Goodwill and Other ("ASC 350") to include in its scope implementation costs of a CCA that is a service contract and clarifies that a customer should apply the guidance in ASC 350-40 to determine which implementation costs should be capitalized in such a CCA. ASU 2018-15 is effective for us beginning January 1, 2020. We are currently assessing the potential impact of the adoption of ASU 2018-15 on our consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842) Section A - Leases: Amendments to the FASB Accounting Standards Codification* ("ASU 2016-02"), its new standard on accounting for leases. ASU 2016-02 introduces a lessee model that brings most leases onto the balance sheet. ASU 2016-02 eliminates the current GAAP requirement for an entity to use bright-line tests in determining lease classification. ASU 2016-02 became effective for us for both interim and annual periods beginning January 1, 2019. Upon adoption of ASU 2016-02, we will recognize lease obligations for the right to use these assets in connection with our existing lease agreements. In July 2018, the FASB issued ASU 2018-11, Leases (Topic 842): Targeted Improvements ("ASU 2018-11") and ASU 2018-10, Codification Improvements to Topic 842, Leases, both of which provided improvements to certain aspects of the guidance in ASC 842, Leases. In January 2018, the FASB issued ASU 2018-01, Leases (Topic 842): Land Easement Practical Expedient for Transition to Topic 842, which provided additional clarification and implementation guidance. We have elected to use the alternative transition method as described in ASU 2018-11, which allows entities to initially apply ASU 2016-02 at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings, with no subsequent adjustments to prior period lease costs for comparability. To illustrate the magnitude of this change, the amount of our off-balance sheet operating leases at December 31, 2018 is disclosed in Note 22 to our consolidated financial statements. Beginning on January 1, 2019, our operating leases, excluding those with terms less than 12 months, were discounted and recorded as assets and liabilities on our consolidated balance sheet.

In addition, the FASB has issued the following accounting pronouncements, none of which we believe will have a material impact on our consolidated financial statements:

In August 2018, the FASB issued ASU 2018-14, *Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans* ("ASU 2018-14"), which amends ASC 715 to add, remove and clarify disclosure requirements related to defined benefit pension and other postretirement plans. ASU 2018-14 is effective for us beginning January 1, 2020.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement* ("ASU 2018-13"), which changes the fair value measurement requirements of ASC 820, *Fair Value Measurement* ("ASC 820"). ASU 2018-13 is effective for us beginning January 1, 2020 for both interim and annual reporting.

In July 2018, the FASB issued ASU 2018-09, *Codification Improvements* ("ASU 2018-09"), which contains amendments to clarify, correct errors in or make minor improvements to the Codification. ASU 2018-09 makes improvements to multiple topics, including but not limited to comprehensive income, debt, income taxes related to both stock-based compensation and business combinations, fair value measurement and defined contribution benefit plans. ASU 2018-09 became effective for us beginning January 1, 2019.

In June 2018, the FASB issued ASU 2018-07, *Compensation - Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07"), which expands the scope of ASC 718, *Compensation - Stock Compensation* ("ASC 718"), to include all share-based payment arrangements related to the acquisition of goods and services from both nonemployees and employees. As a result, most of the guidance in ASC 718 associated with employee share-based payments, including most of its requirements related to classification and measurement, applies to nonemployee share-based payment arrangements. ASU 2018-07 became effective for us beginning January 1, 2019.

In February 2018, the FASB issued ASU 2018-02, *Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income* ("ASU 2018-02"), which amends ASC 220, Income Statement - Reporting Comprehensive Income, to allow a reclassification from accumulated other comprehensive

income to retained earnings for stranded tax effects resulting from the Tax Act and requires entities to provide certain disclosures regarding stranded tax effects. ASU 2018-02 became effective for us beginning January 1, 2019.

In October 2016, the FASB issued ASU 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory* ("ASU 2016-16"), which removes the prohibition in ASC 740, Income Taxes, against the immediate recognition of the current and deferred income tax effects of intra-entity transfers of assets other than inventory. ASU 2016-16 is effective for us beginning January 1, 2019 for both interim and annual reporting periods.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"), which adds an impairment model that is based on expected losses rather than incurred losses. Under ASU 2016-13, an entity recognizes as an allowance its estimate of expected credit losses, which the FASB believes will result in more timely recognition of such losses. ASU 2016-13 is effective for us beginning January 1, 2020 for both interim and annual reporting periods, with early adoption permitted.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to a variety of market risks, including changes in interest rates affecting the return on our investments and foreign currency fluctuations.

At December 31, 2018, our cash, cash equivalents and marketable securities totaled $51 million. We maintain an investment portfolio of various holdings, types and maturities which may include money market funds, commercial paper, corporate notes, certificates of deposit and government debt securities. A sharp rise in market interest rates could have a material adverse impact on the fair value of our investment portfolio. Conversely, declines in market interest rates could have a material impact on the interest earnings of our investment portfolio. We do not currently hedge these interest rate exposures. We place our investments with high quality issuers and have policies limiting, among other things, the amount of credit exposure to any one issuer. We seek to limit default risk by purchasing only investment grade securities. We manage potential losses in fair value by investing in relatively short-term investments, thereby allowing us to hold our investments to maturity. A hypothetical movement of plus or minus 50 basis points in market interest rates would have had an immaterial effect on the value of our investment portfolio for the year ended December 31, 2018. However, we have the ability to hold our investments until maturity, and therefore do not expect our operating results or cash flows to be affected to any significant degree by the effect of a sudden change in market interest rates on our investment portfolio.

Based on a hypothetical 10% adverse movement in all foreign currency exchange rates, our revenue for the year ended December 31, 2018 would have been adversely affected by approximately $9 million and our net loss for the year ended December 31, 2018 would have been adversely affected by approximately $2 million, although the actual effects may differ materially from this hypothetical analysis.

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Ribbon Communications Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Ribbon Communications Inc. and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 4, 2019, expressed an unqualified opinion on the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, the Company adopted Accounting Standards Codification (ASC) Topic 606, “Revenue from Contracts with Customers,” using the modified retrospective adoption method on January 1, 2018.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Deloitte & Touche LLP
Boston, Massachusetts
March 4, 2019

We have served as the Company's auditor since 2005.

RIBBON COMMUNICATIONS INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2018	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 43,694	$ 57,073
Marketable securities	7,284	17,224
Accounts receivable, net	187,853	165,156
Inventory	22,602	21,303
Other current assets	17,002	21,463
Total current assets	278,435	282,219
Property and equipment, net	27,042	24,780
Intangible assets, net	251,391	244,414
Goodwill	383,655	335,716
Investments	—	9,031
Deferred income taxes	9,152	8,434
Other assets	7,484	6,289
	$ 957,159	$ 910,883
Liabilities and Stockholders' Equity		
Current liabilities:		
Revolving credit facility	$ 55,000	$ 20,000
Accounts payable	45,304	45,851
Accrued expenses and other	84,263	76,380
Deferred revenue	105,087	100,571
Total current liabilities	289,654	242,802
Long-term debt, related party	24,100	22,500
Deferred revenue, net of current	17,572	14,184
Deferred income taxes	4,738	2,787
Other long-term liabilities	30,797	13,189
Total liabilities	366,861	295,462
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.01 par value; 10,000,000 shares authorized; none issued and outstanding	—	—
Common stock, 240,000,000 shares authorized, $0.0001 par value, 106,815,636 shares issued and outstanding at December 31, 2018; 101,752,856 shares issued and outstanding at December 31, 2017	11	10
Additional paid-in capital	1,723,576	1,684,768
Accumulated deficit	(1,136,992)	(1,072,426)
Accumulated other comprehensive income	3,703	3,069
Total stockholders' equity	590,298	615,421
	$ 957,159	$ 910,883

See notes to the consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Consolidated Statements of Operations
(in thousands, except per share data)

	Year ended December 31,		
	2018	2017	2016
Revenue:			
Product	$ 279,014	$ 181,119	$ 146,381
Service	298,891	148,823	106,210
Total revenue	577,905	329,942	252,591
Cost of revenue:			
Product	142,185	70,250	47,367
Service	127,388	58,196	37,613
Total cost of revenue	269,573	128,446	84,980
Gross profit	308,332	201,496	167,611
Operating expenses:			
Research and development	145,462	101,481	72,841
Sales and marketing	128,276	83,403	68,539
General and administrative	66,036	47,642	35,948
Acquisition- and integration-related	16,951	14,763	1,152
Restructuring	17,015	9,436	2,740
Total operating expenses	373,740	256,725	181,220
Loss from operations	(65,408)	(55,229)	(13,609)
Interest (expense) income, net	(4,230)	263	769
Other (expense) income, net	(3,772)	1,274	1,424
Loss before income taxes	(73,410)	(53,692)	(11,416)
Income tax (provision) benefit	(3,400)	18,440	(2,516)
Net loss	$ (76,810)	$ (35,252)	$ (13,932)
Loss per share:			
Basic	$ (0.74)	$ (0.60)	$ (0.28)
Diluted	$ (0.74)	$ (0.60)	$ (0.28)
Shares used to compute loss per share:			
Basic	103,916	58,822	49,385
Diluted	103,916	58,822	49,385

See notes to the consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Consolidated Statements of Comprehensive Loss
(in thousands)

	Year ended December 31, 2018	2017	2016
Net loss	$ (76,810)	$ (35,252)	$ (13,932)
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	220	(1,940)	54
Unrealized gain on available-for-sale marketable securities, net of reclassification adjustments for realized amounts	45	146	51
Employee retirement benefits	369	(578)	—
Other comprehensive income (loss), net of tax	634	(2,372)	105
Comprehensive loss, net of tax	$ (76,176)	$ (37,624)	$ (13,827)

See notes to the consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Consolidated Statements of Stockholders' Equity
(in thousands, except share data)

	Common stock Shares	Common stock Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income (loss)	Total stockholders' equity
Balances, January 1, 2016	**49,473,789**	**$ 49**	**$ 1,240,803**	**$ (1,023,242)**	**$ 5,416**	**$ 223,026**
Issuance of common stock in connection with employee stock purchase plan	225,031		1,360			1,360
Exercise of stock options	23,070		153			153
Vesting of restricted stock awards and units	792,773	1	(1)			—
Vesting of performance-based stock awards and units	18,438					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(231,620)		(1,810)			(1,810)
Repurchase of common stock	(1,259,600)	(1)	(9,529)			(9,530)
Stock-based compensation expense			19,768			19,768
Other comprehensive income					87	87
Net loss				(13,932)		(13,932)
Balances, December 31, 2016	**49,041,881**	**49**	**1,250,744**	**(1,037,174)**	**5,503**	**219,122**
Issuance of common stock in connection with employee stock purchase plan	249,621		1,252			1,252
Exercise of stock options	105,688		617			617
Vesting of restricted stock awards and units	2,160,553					—
Vesting of performance-based stock awards and units	145,357					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(807,952)		(7,523)			(7,523)
Shares issued as consideration in connection with acquisition of GENBAND	50,857,708	5	413,977			413,982
Stock-based compensation expense			25,657			25,657
Reclassification between Common stock and Additional paid-in capital to record change in par value of common stock		(44)	44			—
Other comprehensive loss					(2,434)	(2,434)
Net loss				(35,252)		(35,252)
Balances, December 31, 2017	**101,752,856**	**10**	**1,684,768**	**(1,072,426)**	**3,069**	**615,421**
Adoption of Accounting Standards Codification 606, *Revenue from Contracts with Customers*				12,244		12,244
Exercise of stock options	15,935		73			73
Vesting of restricted stock awards and units	1,278,062					—
Vesting of performance-based stock units	57,768					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(524,516)		(2,024)			(2,024)
Shares issued as consideration in connection with acquisition of Edgewater Networks, Inc.	4,235,531	1	29,999			30,000
Assumption of equity awards in connection with acquisition of Edgewater Networks, Inc.			747			747
Stock-based compensation expense			10,013			10,013
Other comprehensive income					634	634
Net loss				(76,810)		(76,810)
Balances, December 31, 2018	**106,815,636**	**$ 11**	**$ 1,723,576**	**$ (1,136,992)**	**$ 3,703**	**$ 590,298**

See notes to the consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year ended December 31, 2018	2017	2016
Cash flows from operating activities:			
Net loss	$ (76,810)	$ (35,252)	$ (13,932)
Adjustments to reconcile net loss to cash flows (used in) provided by operating activities:			
Depreciation and amortization of property and equipment	11,200	8,486	7,970
Amortization of intangible assets	49,723	17,112	7,500
Stock-based compensation	11,072	25,657	19,768
Impairment of intangible assets	—	5,471	—
Deferred income taxes	513	(20,361)	1,088
Other	4,611	(1,340)	(1,265)
Changes in operating assets and liabilities:			
Accounts receivable	(13,017)	(30,759)	(851)
Inventory	993	5,786	4,858
Other operating assets	5,036	269	506
Accounts payable	(6,057)	13,415	(821)
Accrued expenses and other long-term liabilities	(13,422)	(4,263)	(7,778)
Deferred revenue	16,563	23,859	2,149
Net cash (used in) provided by operating activities	(9,595)	8,080	19,192
Cash flows from investing activities:			
Purchases of property and equipment	(7,907)	(3,999)	(4,626)
Business acquisitions, net of cash acquired	(46,389)	(42,951)	(20,669)
Purchases of marketable securities	—	(28,731)	(78,528)
Sale/maturities of marketable securities	18,919	96,112	75,178
Proceeds from the sale of intangible assets	—	576	1,298
Net cash (used in) provided by investing activities	(35,377)	21,007	(27,347)
Cash flows from financing activities:			
Borrowings under revolving line of credit	197,500	15,500	—
Principal payments on revolving line of credit	(162,500)	(13,500)	—
Principal payments of capital lease obligations	(652)	(99)	(43)
Payment of debt issuance costs	(624)	(731)	—
Proceeds from the sale of common stock in connection with employee stock purchase plan	—	1,252	1,360
Proceeds from the exercise of stock options	73	617	153
Payment of tax withholding obligations related to net share settlements of restricted stock awards	(2,024)	(7,523)	(1,810)
Repurchase of common stock	—	—	(9,530)
Net cash provided by (used in) financing activities	31,773	(4,484)	(9,870)
Effect of exchange rate changes on cash and cash equivalents	(180)	547	(163)
Net (decrease) increase in cash and cash equivalents	(13,379)	25,150	(18,188)
Cash and cash equivalents, beginning of year	57,073	31,923	50,111
Cash and cash equivalents, end of year	$ 43,694	$ 57,073	$ 31,923
Supplemental disclosure of cash flow information:			
Interest paid	$ 2,367	$ 317	$ 41
Income taxes paid	$ 5,505	$ 2,290	$ 1,249
Income tax refunds received	$ 537	$ 274	$ 511
Supplemental disclosure of non-cash investing activities:			
Capital expenditures incurred, but not yet paid	$ 1,127	$ 1,043	$ 277
Property and equipment acquired under capital lease	$ 2,178	$ —	$ 36
Business acquisition purchase consideration - common stock issued	$ 30,000	$ 413,982	$ —
Business acquisition purchase consideration - deferred payments	$ 30,000	$ —	$ —
Business acquisition purchase consideration - note issued to selling equity holders	$ —	$ 22,500	$ —
Business acquisition purchase consideration - assumed equity awards	$ 747	$ —	$ —
Supplemental disclosure of non-cash financing activities:			
Total fair value of restricted stock awards, restricted stock units, performance-based stock awards and performance-based stock units on date vested	$ 8,312	$ 20,515	$ 10,376

See notes to the consolidated financial statements.

(1) NATURE OF THE BUSINESS

Ribbon is a leading provider of next generation ("NextGen") software solutions to telecommunications, wireless and cable service providers and enterprises of all sizes across industry verticals. With over 1,000 customers around the globe, including some of the largest telecommunications service providers and enterprises in the world, Ribbon enables service providers and enterprises to modernize their communications networks through software and provide secure RTC solutions to their customers and employees. By securing and enabling reliable and scalable IP networks, Ribbon helps service providers and enterprises adopt the next generation of software-based virtualized and cloud communications technologies to drive new, incremental revenue, while protecting their existing revenue streams. Ribbon's software solutions provide a secure way for its customers to connect and leverage multivendor, multiprotocol communications systems and applications across their networks and the cloud, around the world and in a rapidly changing ecosystem of IP-enabled devices, such as smartphones and tablets. In addition, Ribbon's software solutions secure cloud-based delivery of UC solutions - both for service providers transforming to a cloud-based network and for enterprises using cloud-based UC. Ribbon sells its software solutions through both direct sales and indirect channels globally, leveraging the assistance of resellers, and provides ongoing support to its customers through a global services team with experience in design, deployment and maintenance of some of the world's largest software IP networks.

(2) BASIS OF PRESENTATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The consolidated financial statements have been prepared in United States dollars, in accordance with accounting principles generally accepted in the United States ("GAAP").

On August 3, 2018 (the "Edgewater Acquisition Date"), the Company completed the acquisition of Edgewater Networks, Inc. ("Edgewater" and such acquisition, the "Edgewater Acquisition"). The financial results of Edgewater are included in the Company's consolidated financial statements for the period subsequent to the Edgewater Acquisition Date.

On October 27, 2017 (the "Merger Date"), Sonus Networks, Inc. ("Sonus") consummated an acquisition as specified in an Agreement and Plan of Merger (the “Merger Agreement”) with Solstice Sapphire Investments, Inc. ("NewCo") and certain of its wholly-owned subsidiaries, GENBAND Holdings Company, GENBAND Inc. and GENBAND II, Inc. (collectively, "GENBAND") pursuant to which, following a series of merger transactions (collectively, the "Merger"), Sonus and GENBAND each became a wholly-owned subsidiary of NewCo, with Sonus deemed the acquirer in the transaction for accounting purposes. Subsequently, on November 28, 2017, the Company changed its name to "Ribbon Communications Inc."

The consolidated financial statements of the Company represent the consolidated financial statements of Sonus, prior to the Merger Date, and the consolidated financial statements of Ribbon, on and after the Merger Date. The financial results of GENBAND are included in Ribbon's consolidated financial statements beginning on the Merger Date.

On September 26, 2016 (the "Taqua Acquisition Date"), the Company acquired Taqua, LLC ("Taqua"). The financial results of Taqua are included in the Company's consolidated financial statements beginning on the Taqua Acquisition Date.

Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of Ribbon and its wholly-owned subsidiaries. All intercompany transactions and balances have been eliminated in consolidation.

Use of Estimates and Judgments

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting periods. Significant estimates and judgments relied upon in preparing these consolidated financial statements include accounting for business combinations, revenue recognition for multiple element arrangements, inventory valuations, assumptions used to determine the fair value of stock-based compensation, intangible assets and goodwill valuations, legal contingencies and recoverability of Ribbon's net deferred tax assets and the related valuation allowances. Ribbon regularly assesses these estimates and records changes in estimates in the period in which they become known. Ribbon bases its estimates on historical experience and various other assumptions that it believes to be reasonable under the circumstances. Actual results could differ from those estimates.

Reclassifications

Certain reclassifications, not affecting previously reported net loss, have been made to the previously issued financial statements to conform to the current period presentation.

Business Combinations

The Company recognizes identifiable assets acquired and liabilities assumed at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred over the net of the acquisition date fair values of the assets acquired and the liabilities assumed and represents the expected future economic benefits arising from other assets acquired in the business combination that are not individually identified and separately recognized. While the Company uses its best estimates and assumptions as part of the purchase price allocation process to accurately value assets acquired and liabilities assumed at the acquisition date, its estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill to the extent that it identifies adjustments to the preliminary purchase price allocation. Upon the conclusion of the measurement period or final determination of the values of assets acquired and liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the consolidated statements of operations.

Revenue Recognition

Effective January 1, 2018, the Company adopted Accounting Standards Codification ("ASC") 606, *Revenue from Contracts with Customers* ("ASC 606" or the "New Revenue Standard") using the modified retrospective approach. As a result, the Company changed its accounting policy for revenue recognition, which is described below and in Note 14.

The Company derives revenue from two primary sources: products and services. Product revenue includes the Company's appliances and software that function together to deliver the products' essential functionality. Software and appliances are also sold on a standalone basis. Services include customer support (software updates, upgrades and technical support), consulting, design services, installation services and training. Generally, contracts with customers contain multiple performance obligations, consisting of products and services. For these contracts, the Company accounts for individual performance obligations separately if they are considered distinct.

When an arrangement contains more than one performance obligation, the Company will generally allocate the transaction price to each performance obligation on a relative standalone selling price basis. The Company utilizes the observable price of goods and services when they are sold separately to similar customers in order to estimate standalone selling price.

The Company's software licenses typically provide a perpetual right to use the Company's software. The Company also sells term-based software licenses that expire and Software-as-a-Service ("SaaS")-based software which are referred to as subscription arrangements. The Company does not customize its software nor are installation services required, as the customer has a right to utilize internal resources or a third-party service company. The software and appliances are delivered before related services are provided and are functional without professional services or customer support. The Company has concluded that its software licenses are functional intellectual property that are distinct, as the user can benefit from the software on its own. The product revenue is typically recognized upon transfer of control or when the software is made available for download, as this is the point that the user of the software can direct the use of, and obtain substantially all of the remaining benefits from, the functional intellectual property. The Company does not recognize software revenue related

to the renewal of subscription software licenses earlier than the beginning of the subscription period. Appliance products are generally sold with software to provide the customer solution.

The Company offers warranties on its products. Certain of the Company's warranties are considered to be assurance-type in nature and do not cover anything beyond ensuring that the product is functioning as intended. Based on the guidance in ASC 606, assurance-type warranties do not represent separate performance obligations. The Company also sells separately-priced maintenance service contracts which qualify as service-type warranties and represent separate performance obligations. The Company does not allow and has no history of accepting product returns.

Services revenue includes revenue from customer support and other professional services. Customer support includes software updates on a when-and-if-available basis, telephone support, integrated web-based support and bug fixes or patches. The Company sells its customer support contracts at a percentage of list or net product price related to the support. Customer support revenue is recognized ratably over the term of the customer support agreement, which is typically one year.

The Company's professional services include consulting, technical support, resident engineer services, design services and installation services. Because control transfers over time, revenue is recognized based on progress toward completion of the performance obligation. The method to measure progress toward completion requires judgment and is based on the nature of the products or services to be provided. The Company generally uses the input method to measure progress for its contracts because it believes such method best depicts the transfer of assets to the customer, which occurs as the Company incurs costs for the contracts. Under the cost-to-cost measure of progress, the progress toward completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. When the measure of progress is based upon expended labor, progress toward completion is measured as the ratio of labor time expended to date vs the total estimated labor time required to complete the performance obligation. Revenue is recorded proportionally as costs are incurred or labor is expended. Costs to fulfill these obligations include internal labor as well as subcontractor costs.

Customer training includes courses offered by the Company. The related revenue is typically recognized as the training services are performed.

Financial Instruments

The carrying amounts of Ribbon's financial instruments approximate their fair values and include cash equivalents, investments, accounts receivable, borrowings under a revolving credit facility, accounts payable and long-term debt.

All investments in marketable securities are classified as available-for-sale and are reported at fair value, with unrealized gains and losses excluded from earnings and reported, net of tax, in Accumulated other comprehensive loss, which is a component of stockholders' equity. Unrealized losses that are determined to be other-than-temporary, based on current and expected market conditions, are recognized in earnings. Declines in fair value determined to be credit-related are charged to earnings. The cost of marketable securities sold is determined by the specific identification method.

Financial instruments with remaining maturities or that are due within one year from the balance sheet date are classified as current. Financial instruments with remaining maturities or that are payable more than one year from the balance sheet date are classified as noncurrent.

Cash and Cash Equivalents

Cash equivalents are stated at fair value. Cash equivalents are liquid securities that have remaining maturities of three months or less at the date of purchase.

Restricted Cash

The Company classifies as restricted cash all cash pledged as collateral to secure long-term obligations and all cash whose use is otherwise limited by contractual provisions. Restricted cash is recorded within other current assets on the consolidated balance sheet.

Foreign Currency Translation

For foreign subsidiaries where the functional currency is the local currency, assets and liabilities are translated into U.S. dollars at the current exchange rate on the balance sheet date. Revenue and expenses are translated at average rates of exchange prevailing during each period. Translation adjustments for these subsidiaries are included in Accumulated other comprehensive income.

For foreign subsidiaries where the functional currency is the U.S. dollar, monetary assets and liabilities are translated into U.S. dollars at the current exchange rate on the balance sheet date. Nonmonetary assets and liabilities are remeasured into U.S. dollars at historical exchange rates. Revenue and expense items are translated at average rates of exchange prevailing during each period.

Realized and unrealized foreign currency gains and losses arising from transactions denominated in currencies other than the subsidiary's functional currency are reflected in earnings.

Effective on the Merger Date, the Company began to record its foreign currency gains (losses) as a component of Other income (expense), net. The Company did not reclassify amounts previously recorded within General and administrative expenses as the amounts were not material to the consolidated results of the Company. The Company recognized a net foreign currency loss of $4.6 million for the year ended December 31, 2018, a net foreign currency gain of $0.7 million for the year ended December 31, 2017 and a net foreign currency loss of $0.3 million for the year ended December 31, 2016.

Inventory

Inventory is recorded at the lower of cost or market value using the first-in, first-out convention. The Company reduces the carrying value of inventory for those items that are potentially excess, obsolete or slow-moving based on changes in customer demand, technology developments or other economic factors.

Ribbon writes down evaluation equipment at the time of shipment to its customers, as it is probable that the inventory value will not be realized.

Deferred product costs represent deferred cost of revenue for product shipments to customers prior to satisfaction of Ribbon's revenue recognition criteria. The Company classifies inventory that is not expected to be consumed within one year from the balance sheet date as noncurrent and includes such inventory as a component of Other assets.

Property and Equipment

Property and equipment are stated at cost, net of accumulated depreciation. Expenditures for maintenance and repairs are charged to expense as incurred. Depreciation is computed using the straight-line method over the estimated useful lives of the related assets, which range from two to five years. Leasehold improvements are amortized over the lesser of the lease term or five years. When an asset is sold or retired, the cost and related accumulated depreciation or amortization are eliminated, and the resulting gain or loss, if any, is recognized in income (loss) from operations in the consolidated statement of operations. The Company reviews property and equipment for impairment in the same manner as intangible assets discussed below.

Software development costs associated with internal use software are incurred in three stages of development: the preliminary project stage, the application development stage and the post-implementation stage. Costs incurred during the preliminary project and post-implementation stages are expensed as incurred. Certain qualifying costs incurred during the application development stage are capitalized as property and equipment. Internal use software is amortized on a straight-line basis over its estimated useful life of three years, beginning when the software is ready for its intended use.

Intangible Assets and Goodwill

Intangible assets are comprised of certain intangible assets arising from the Merger, the Edgewater Acquisition and previous acquisitions. These intangible assets include a combination of in-process research and development, developed technology, customer relationships, trade names, and internal use software. Intangible assets are reviewed for impairment

when events or changes in circumstances indicate that their carrying amounts may not be recoverable based upon the estimated undiscounted cash flows. Recoverability of intangible assets with estimated lives and other long-lived assets is measured by a comparison of the carrying amount of an asset or asset group to future net undiscounted cash flows expected to be generated by the asset or asset group. If these comparisons indicate that an asset is not recoverable, the Company will recognize an impairment loss for the amount by which the carrying value of the asset or asset group exceeds the related estimated fair value. Estimated fair value is based on either discounted future operating cash flows or appraised values, depending on the nature of the asset. The Company amortizes its intangible assets over their respective useful lives, with the exception of in-process research and development, which has an indefinite life until the product is generally available, at which time such asset is typically reclassified to developed technology, and the Company begins to amortize this asset. See Note 9 for additional information regarding the Company's intangible assets.

Goodwill is recorded when the consideration for an acquisition exceeds the fair value of net tangible and identifiable intangible assets acquired. Goodwill is not amortized, but instead is tested for impairment at least annually, or more frequently if indicators of potential impairment exist, by comparing the fair value of the Company's reporting unit to its carrying value.

The Company's annual testing for impairment of goodwill is completed as of November 30. The Company operates as a single operating segment with one reporting unit and consequently evaluates goodwill for impairment based on an evaluation of the fair value of the Company as a whole. The Company performed its step one assessments for each of the years ended December 31, 2018, 2017 and 2016 and determined each year that its fair value was in excess of its carrying value and accordingly, there was no impairment of goodwill. At certain times during the year ended December 31, 2018, including at the Company's annual testing date of November 30, 2018, the Company's market capitalization was below its book value. While the Company has concluded that the fair value exceeds carrying value at that date, the Company regularly monitors for changes in circumstances, including changes to the Company's performance, that could result in impairment of goodwill.

Other Assets

Other assets are primarily comprised of the long-term portions of inventory, prepaid expenses and deposits.

Stock-Based Compensation

The Company's stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as expense over the requisite service period, which generally represents the vesting period, and includes an estimate of the awards that will be forfeited.

The Company uses the Black-Scholes valuation model for estimating the fair value on the date of grant of stock options. The fair value of stock option awards is affected by the Company's stock price as well as valuation assumptions, including the volatility of Ribbon's stock price, expected term of the option, risk-free interest rate and expected dividends.

The Company may grant performance-based stock units ("PSUs") that include a market condition to certain of its executives. The Company uses a Monte Carlo simulation approach to model future stock price movements based upon the risk-free rate of return, the volatility of each entity and the pair-wise covariance between each entity. These results are then used to calculate the grant date fair values of the PSUs.

Research and Development Costs

Research and development costs are expensed as incurred.

Concentrations of Credit Risk

The financial instruments that potentially subject Ribbon to concentrations of credit risk are cash, cash equivalents, investments and accounts receivable. The Company's cash equivalents and investments were managed by one financial institution at both December 31, 2018 and 2017. Historically, the Company has not experienced significant losses due to such bank depository concentration.

Certain components and software licenses from third parties used in Ribbon's products are procured from single sources of supply. The failure of a supplier, including a subcontractor, to deliver on schedule could delay or interrupt Ribbon's delivery of products and thereby materially adversely affect Ribbon's revenue and operating results.

Advertising Costs

Advertising costs are expensed as incurred and included as a component of Sales and marketing expense in the Company's consolidated statements of operations. Advertising expenses were $0.5 million for the year ended December 31, 2018, $0.3 million for the year ended December 31, 2017 and $0.1 million for the year ended December 31, 2016.

Operating Segments

The Company operates in a single segment, as the chief operating decision maker makes decisions and assesses performance at the company level. Operating segments are identified as components of an enterprise about which separate discrete financial information is utilized for evaluation by the chief operating decision maker in making decisions regarding resource allocation and assessing performance. To date, the chief operating decision maker has made such decisions and assessed performance at the company level, as one segment. The Company's chief operating decision maker is its President and Chief Executive Officer.

Loss Contingencies and Reserves

Ribbon is subject to ongoing business risks arising in the ordinary course of business, including legal claims, that affect the estimation process of the carrying value of assets, the recording of liabilities and the possibility of various loss contingencies. An estimated loss contingency is accrued when it is probable that a liability has been incurred or an asset has been impaired and the amount of loss can be reasonably estimated. Ribbon regularly evaluates current information available to determine whether such amounts should be adjusted and records changes in estimates in the period they become known.

An allowance for doubtful accounts is estimated based on the Company's assessment of the collectability of specific customer accounts.

Ribbon accrues for royalties for technology that it licenses from vendors based on established royalty rates and usage. In certain cases, Ribbon has been contacted by third parties who claim that Ribbon's products infringe on certain intellectual property of a third party. Ribbon evaluates these claims and accrues amounts when it is probable that the obligation has been incurred and the amounts are reasonably estimable.

Accounting for Income Taxes

Deferred tax assets and liabilities are recognized for the expected future consequences of events that have been reflected in the consolidated financial statements. Deferred tax assets and liabilities are determined based on the differences between the financial reporting and tax basis of assets and liabilities and operating loss carryforwards, using tax rates expected to be in effect for the years in which the differences are expected to reverse. The Company records valuation allowances to reduce deferred income tax assets to the amount that is more likely than not to be realized.

The Company has provided for income taxes on the undistributed earnings of its non-U.S. subsidiaries as of December 31, 2018, with the exception of the Company's Irish subsidiary, as the Company does not plan to permanently reinvest these amounts outside the United States. The repatriation of the undistributed earnings would result in withholding taxes imposed on the repatriation. Consequently, the Company has recorded a tax liability of $4.5 million, primarily consisting of withholding and distribution taxes, relating to undistributed earnings from these subsidiaries as of December 31, 2018. Had the earnings of the Irish subsidiary been determined to not be permanently reinvested outside the U.S., no additional deferred tax liability would be required due to no withholding taxes or income tax expense being imposed on such repatriation.

The Company determines whether it is more likely than not that a tax position will be sustained upon examination. If it is not more likely than not that a position will be sustained, no amount of the benefit attributable to the position is recognized. The tax benefit to be recognized of any tax position that meets the more likely than not recognition threshold is calculated as

the largest amount that is more than 50% likely of being realized upon resolution of the contingency. The Company accounts for interest and penalties related to uncertain tax positions as part of its provision for income taxes.

Defined Benefit Plans

The Company has defined benefit plans for some of its employees at various international locations. The Company recognizes retirement benefit assets or liabilities in the consolidated balance sheets reflecting the funded status of pension and other retirement benefit plans. Retirement benefit assets and liabilities are adjusted for the difference between the benefit obligations and the plan assets at fair value (measured at year-end), with the offset recorded directly to stockholders' equity through accumulated other comprehensive income (loss), net of tax. The amount recorded in stockholders' equity represents the after-tax unamortized actuarial gains or losses, unamortized transition obligations and unamortized prior service costs.

Recent Accounting Pronouncements

In May 2017, the Financial Accounting Standards Board ("FASB") issued ASU 2017-09, *Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting* ("ASU 2017-09"), which amends the scope of modification accounting for share-based payment arrangements such that an entity would not apply modification accounting if the fair value, vesting conditions and classification of the awards are the same immediately before and after the modification. ASU 2017-09 became effective for the Company beginning January 1, 2018 for both interim and annual reporting periods. The adoption of ASU 2017-09 did not have a material impact on the Company's consolidated financial statements.

In March 2017, the FASB issued ASU 2017-07, *Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post Retirement Benefit Cost* ("ASU 2017-07"). ASU 2017-07 amends the requirements in ASC 715, *Compensation - Retirement Benefits* ("ASC 715") to require entities to disaggregate the current-service-cost component from the other components of net benefit cost (the "other components") and include it with other current compensation costs for related employees, present the other components elsewhere in the income statement and outside of income from operations if such a subtotal is presented and disclose the income statement lines that contain the other components if they are not presented on appropriately described separate lines. ASU 2017-07 became effective for the Company beginning January 1, 2018 for both interim and annual reporting periods. The adoption of ASU 2017-07 did not have a material impact on the Company's consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), which adds or clarifies guidance on eight cash flow issues, including debt prepayment or debt extinguishment costs, settlement of zero-coupon debt instruments or certain other debt instruments, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies, distributions received from equity method investees, beneficial interests in securitization transactions and separately identifiable cash flows and application of the predominance principle. ASU 2016-15 became effective for the Company beginning January 1, 2018 for both interim and annual reporting periods. Entities must apply the guidance retrospectively to all periods presented but may apply it prospectively from the earliest date practicable if retrospective application would be impracticable. The adoption of ASU 2016-15 did not have a material impact on the Company's consolidated financial statements.

In August 2018, the FASB issued ASU 2018-15, *Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* ("ASU 2018-15"), which provides guidance on implementation costs incurred in a cloud computing arrangement ("CCA") that is a service contract. ASU 2018-15 amends ASC 350, *Intangibles - Goodwill and Other* ("ASC 350") to include in its scope implementation costs of a CCA that is a service contract and clarifies that a customer should apply the guidance in ASC 350-40 to determine which implementation costs should be capitalized in such a CCA. ASU 2018-15 is effective for the Company beginning January 1, 2020. The Company is currently assessing the potential impact of the adoption of ASU 2018-15 on its consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842) Section A - Leases: Amendments to the FASB Accounting Standards Codification* ("ASU 2016-02"), its new standard on accounting for leases. ASU 2016-02 introduces a lessee model that brings most leases onto the balance sheet. ASU 2016-02 eliminates the current GAAP requirement for an entity to use bright-line tests in determining lease classification. ASU 2016-02 became effective for the Company for both interim and annual periods beginning January 1, 2019. Upon adoption of ASU 2016-02, the Company will recognize lease obligations for the right to use these assets in connection with its existing lease agreements. In July 2018, the FASB issued ASU 2018-11, *Leases (Topic 842): Targeted Improvements* ("ASU 2018-11") and ASU 2018-10, *Codification Improvements to Topic 842, Leases*, both of which provided improvements to certain aspects of the guidance in ASC 842, Leases. In January 2018, the FASB issued ASU 2018-01, *Leases (Topic 842): Land Easement Practical Expedient for Transition to Topic 842*, which provided additional clarification and implementation guidance. The Company has elected to use the alternative transition method as described in ASU 2018-11, which allows entities to initially apply ASU 2016-02 at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings, with no subsequent adjustments to prior period lease costs for comparability. To illustrate the magnitude of this change, the amount of the Company's off-balance sheet operating leases at December 31, 2018 is disclosed in Note 22. Beginning on January 1, 2019, the Company's operating leases, excluding those with terms less than 12 months, were discounted and recorded as assets and liabilities in the Company's consolidated balance sheet.

In addition, the FASB has issued the following accounting pronouncements, none of which the Company believes will have a material impact on its consolidated financial statements:

In August 2018, the FASB issued ASU 2018-14, *Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans* (“ASU 2018-14”), which amends ASC 715 to add, remove and clarify disclosure requirements related to defined benefit pension and other postretirement plans. ASU 2018-14 is effective for the Company beginning January 1, 2020.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement* (“ASU 2018-13”), which changes the fair value measurement requirements of ASC 820, *Fair Value Measurement* (“ASC 820”). ASU 2018-13 is effective for the Company beginning January 1, 2020 for both interim and annual reporting.

In July 2018, the FASB issued ASU 2018-09, *Codification Improvements* (“ASU 2018-09”), which contains amendments to clarify, correct errors in or make minor improvements to the Codification. ASU 2018-09 makes improvements to multiple topics, including but not limited to comprehensive income, debt, income taxes related to both stock-based compensation and business combinations, fair value measurement and defined contribution benefit plans. ASU 2018-09 became effective for the Company beginning January 1, 2019.

In June 2018, the FASB issued ASU 2018-07, *Compensation - Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07"), which expands the scope of ASC 718, *Compensation - Stock Compensation* ("ASC 718"), to include all share-based payment arrangements related to the acquisition of goods and services from both nonemployees and employees. As a result, most of the guidance in ASC 718 associated with employee share-based payments, including most of its requirements related to classification and measurement, applies to nonemployee share-based payment arrangements. ASU 2018-07 became effective for the Company beginning January 1, 2019.

In February 2018, the FASB issued ASU 2018-02, I*ncome Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income* ("ASU 2018-02"), which amends ASC 220, *Income Statement - Reporting Comprehensive Income*, to allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act (the "Tax Act") and requires entities to provide certain disclosures regarding stranded tax effects. ASU 2018-02 became effective for the Company beginning January 1, 2019.

In October 2016, the FASB issued ASU 2016-16, I*ncome Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory* ("ASU 2016-16"), which removes the prohibition in ASC 740, Income Taxes, against the immediate recognition of the current and deferred income tax effects of intra-entity transfers of assets other than inventory. ASU 2016-16 became effective for the Company beginning January 1, 2019 for both interim and annual reporting periods.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"), which adds an impairment model that is based on expected losses rather than incurred losses. Under ASU 2016-13, an entity recognizes as an allowance its estimate of expected credit losses, which

the FASB believes will result in more timely recognition of such losses. ASU 2016-13 is effective for the Company beginning January 1, 2020 for both interim and annual reporting periods, with early adoption permitted.

(3) BUSINESS ACQUISITIONS

Edgewater Networks, Inc.

On the Edgewater Acquisition Date, the Company completed its acquisition of Edgewater, a private company headquartered in San Jose, California. The Edgewater Acquisition was completed in accordance with the terms and conditions of the Agreement and Plan of Merger, dated as of June 24, 2018, by and among Ribbon, Merger Sub, Edgewater and Shareholder Representative Services LLC, a Colorado limited liability company, solely in its capacity as the initial holder representative (the "Edgewater Merger Agreement”).

Edgewater is a market leader in Network Edge Orchestration for the small and medium enterprise and UC market. The Company believes that the acquisition of Edgewater will allow it to offer its global customer base a complete core-to-edge product portfolio, end-to-end service assurance and analytics solutions, and a fully integrated software-defined SD-WAN service.

As consideration for the Edgewater Acquisition, Ribbon paid, in the aggregate, $46.4 million of cash, net of cash acquired, and issued 4.2 million shares of Ribbon common stock to Edgewater's selling shareholders and holders of vested in-the-money options and warrants to acquire common stock of Edgewater (the "Edgewater Selling Stakeholders") on the Edgewater Acquisition Date. Pursuant to the Edgewater Merger Agreement and subject to the terms and conditions contained therein, Ribbon agreed to pay the Edgewater Selling Stakeholders an additional $30 million of cash, $15 million of which was to be paid 6 months from the closing date and the other $15 million of which was to be paid as early as 9 months from the closing date and no later than 18 months from the closing date (the exact timing of which would depend on the amount of revenue generated from the sales of Edgewater products in 2018) ("Edgewater Deferred Consideration"). The current portion of this deferred purchase consideration is included as a component of Accrued expenses and other, and the noncurrent portion is included as a component of Other long-term liabilities in the Company's consolidated balance sheet as of December 31, 2018. On February 15, 2019, the Company and the Edgewater Selling Stakeholders agreed to reduce the amount of Edgewater Deferred Consideration from $30 million to $21.9 million and agreed that all such deferred consideration will be payable on March 8, 2019.

The Edgewater Acquisition has been accounted for as a business combination and the financial results of Edgewater have been included in the Company's consolidated financial statements for the period subsequent to its acquisition.

As of December 31, 2018, the valuation of acquired assets, identifiable intangible assets and certain assumed liabilities was preliminary. During the fourth quarter of 2018, the Company recorded changes to the initial preliminary purchase price allocation, primarily comprised of a decrease of $0.7 million to current assets and an increase to other current liabilities of $0.5 million. These adjustments, along with other immaterial adjustments, resulted in a net increase to goodwill of $1.3 million since September 30, 2018. The Company is continuing the process of investigating the facts and circumstances existing as of the Edgewater Acquisition Date in order to finalize its valuation. The Company expects to finalize the valuation of the assets acquired and liabilities assumed by the third quarter of 2019.

A summary of the preliminary allocation of the purchase consideration for Edgewater is as follows (in thousands):

Fair value of consideration transferred:	
Cash consideration:	
Cash paid to Edgewater Selling Stakeholders	$ 51,162
Less cash acquired	(4,773)
Net cash consideration	46,389
Unpaid cash consideration	30,000
Fair value of Ribbon stock issued	30,000
Fair value of equity awards assumed (see Note 16)	747
Fair value of total consideration	$ 107,136

Fair value of assets acquired and liabilities assumed:	
Current assets, net of cash acquired	$ 16,098
Property and equipment	245
Intangible assets:	
Developed technology	29,500
Customer relationships	26,100
Trade names	1,100
Goodwill	48,053
Other noncurrent assets	103
Deferred revenue	(2,749)
Other current liabilities	(9,926)
Deferred revenue, net of current	(669)
Other long-term liabilities	(719)
	$ 107,136

The valuation of the acquired intangible assets is inherently subjective and relies on significant unobservable inputs. The Company used an income approach to value the acquired developed technology, customer relationships and trade name intangible assets. The valuation for each of these intangible assets was based on estimated projections of expected cash flows to be generated by the assets, discounted to the present value at discount rates commensurate with perceived risk. The valuation assumptions take into consideration the Company's estimates of customer attrition, technology obsolescence and revenue growth projections. The Company is amortizing the identifiable intangible assets arising from the Edgewater Acquisition in relation to the expected cash flows from the individual intangible assets over their respective useful lives, which have a weighted average life of 8.4 years (see Note 9). Goodwill resulting from the transaction is primarily due to expected synergies between the combined companies and is not deductible for tax purposes.

The Company's revenue for the year ended December 31, 2018 included $21.5 million of revenue and $4.3 million of net loss attributable to Edgewater since the Edgewater Acquisition Date. The Company has not provided pro forma financial information, as the historical amounts are not significant to the Company's consolidated financial statements.

GENBAND Merger

On October 27, 2017, Sonus consummated an acquisition as specified in the Merger Agreement with NewCo and GENBAND such that, following the Merger, each of Sonus and GENBAND became a wholly-owned subsidiary of NewCo, with Sonus deemed the acquirer in the transaction for accounting purposes. On November 28, 2017, the Company changed its name to "Ribbon Communications Inc."

Prior to the Merger, GENBAND was a Cayman Islands exempted company limited by shares that was formed on April 7, 2010. Through its wholly owned operating subsidiaries, GENBAND created rapid communications and applications for service providers, enterprises, independent software vendors, system integrators and developers globally. A majority of GENBAND's shares were held by JPMorgan Chase & Co. and managed by One Equity Partners ("OEP"). GENBAND shares were not listed on an exchange or quoted on any automated services, and there was no established trading market for GENBAND shares.

The Company believes that Sonus' and GENBAND's complementary products, solutions and strategies have positioned the combined company to deliver comprehensive solutions to service providers and enterprises migrating to a virtualized all-IP environment in an expanded customer and global footprint.

Pursuant to the Merger Agreement, NewCo issued 50.9 million shares of Sonus common stock to the GENBAND equity holders, with the number of shares issued in the aggregate to the GENBAND equity holders equal to the number of shares of Sonus common stock outstanding immediately prior to the closing date of the Merger, such that former stockholders of Sonus would own approximately 50%, and former shareholders of GENBAND would own approximately 50%, of the shares of NewCo common stock issued and outstanding immediately following the consummation of the Merger.

In addition, NewCo repaid GENBAND’s long-term debt, including both principal and unpaid interest, to a related party of GENBAND totaling $48.0 million and repaid GENBAND’s management fees due to an affiliate of OEP totaling $10.3 million. NewCo also issued a promissory note for $22.5 million to certain GENBAND equity holders.

NewCo assumed the liability under GENBAND's revolving credit facility with Silicon Valley Bank, which had outstanding borrowings and letters of credit totaling $17.9 million and $2.9 million, respectively, at October 27, 2017. At October 27, 2017, the outstanding borrowings had an average interest rate of 4.67%.

The Merger has been accounted for as a business combination and the financial results of GENBAND have been included in the Company's consolidated financial statements for the period subsequent to its acquisition.

As of December 31, 2018, the valuation of acquired assets, identifiable intangible assets and certain assumed liabilities was final, as the Company finalized the valuation of the assets acquired and liabilities assumed in the third quarter of 2018. A summary of the final allocation of the purchase consideration for GENBAND is as follows (in thousands):

Fair value of consideration transferred:	
Cash consideration:	
Repayment of GENBAND long-term debt and accrued interest, related party	$ 47,973
Payment of GENBAND management fees due to majority shareholder	10,302
Less cash acquired	(15,324)
Net cash consideration	42,951
Fair value of Sonus stock issued	413,982
Promissory note issued to GENBAND equity holders	22,500
Fair value of total consideration	$ 479,433

Fair value of assets acquired and liabilities assumed:	
Current assets, net of cash acquired	$ 99,126
Property and equipment	16,770
Intangible assets:	
In-process research and development	5,600
Developed technology	129,000
Customer relationships	101,300
Trade names	900
Goodwill	285,825
Other noncurrent assets	6,732
Revolving credit facility	(17,930)
Deferred revenue	(32,390)
Other current liabilities	(80,023)
Deferred revenue, net of current	(6,804)
Other long-term liabilities	(28,673)
	$ 479,433

The valuation of acquired intangible assets is inherently subjective and relies on significant unobservable inputs. The Company used an income approach to value the acquired developed technology, customer relationships and trade name intangible assets. The valuation for each of these intangible assets was based on estimated projections of expected cash flows to be generated by the assets, discounted to the present value at discount rates commensurate with perceived risk. The valuation assumptions took into consideration the Company's estimates of customer attrition, technology obsolescence and revenue growth projections. The Company will reclassify its in-process research and development intangible asset to a developed technology intangible asset in the period that the related product becomes generally available and will begin to record amortization expense for the developed technology intangible asset at that time. The Company is amortizing the identifiable intangible assets arising from the Merger in relation to the expected cash flows from the individual intangible assets over their respective useful lives, which have a weighted average life of 8.3 years (see Note 9). Goodwill resulting from the transaction is primarily due to expected synergies between the combined companies and is not deductible for tax purposes.

Pro Forma Results

The following unaudited pro forma information presents the condensed combined results of operations of Sonus and GENBAND for the years ended December 31, 2017 and 2016 as if the Merger had been completed on January 1, 2016, with adjustments to give effect to pro forma events that are directly attributable to the Merger. These pro forma adjustments include a reduction of historical GENBAND revenue for the fair value adjustment related to acquired deferred revenue, an increase in amortization expense for the acquired identifiable intangible assets, a decrease in historical GENBAND interest expense reflecting the extinguishment of certain of GENBAND's debt as a result of the Merger, net of the interest expense recorded in connection with the promissory note issued to certain GENBAND equity holders as part of the purchase consideration and the elimination of revenue and costs related to sales transactions between Sonus and GENBAND. Pro forma adjustments also include the elimination of acquisition- and integration-related costs directly attributable to the acquisition and incremental stock-based compensation expense directly attributable to the acquisition from the year ended December 31, 2017 and inclusion of such costs in the year ended December 31, 2016.

The unaudited pro forma results do not reflect any operating efficiencies or potential cost savings that may result from the consolidation of the operations of Sonus and GENBAND. Accordingly, these unaudited pro forma results are presented for illustrative purposes and are not intended to represent or be indicative of the actual results of operations of the combined company that would have been achieved had the Merger occurred at the beginning of the periods presented, nor are they intended to represent or be indicative of future results of operations (in thousands, except per share amounts):

	Year ended December 31,	
	2017	2016
	(unaudited)	
Revenue	$ 615,286	$ 631,914
Net loss	$ (69,741)	$ (147,394)
Loss per share	$ (0.69)	$ (1.46)

Taqua, LLC

The Company acquired Taqua, a privately-held company, on September 26, 2016 (the "Taqua Acquisition Date"). Taqua enables the transformation of software-based service provider networks to deliver next-generation voice, video and messaging services, including VoIP, VoWiFi and VoLTE. In consideration for the acquisition of Taqua, Sonus paid $19.9 million in cash to the sellers on the Taqua Acquisition Date, net of cash acquired. The Company also entered into an Earn-Out Agreement, dated as of September 26, 2016, with Taqua Holdings, LLC and Jeffrey L. Brawner, the seller representative in the transaction, under which there is the potential for additional cash payments of up to $65 million in the aggregate to the sellers if certain annual revenue thresholds are exceeded as measured annually through 2020. The Company had initially recorded $10 million of contingent consideration as of the Taqua Acquisition Date, with the estimate based on historical sales and probability weighted cash flows related to forecasted sales. Because there are unobservable inputs to the valuation methodology that are significant to the measurement of its fair value, namely, forecasted sales, the Company had categorized the earn-out at Level 3 within the fair value hierarchy. During the fourth quarter of 2016, the Company reassessed the historical and updated forecasted sales and accordingly, reversed the previous estimated contingent consideration such that as of December 31, 2016, no incremental

contingent consideration was recorded. In July 2017, Taqua Holdings, LLC ("Holdings") filed a lawsuit against the Company alleging that the Company had breached the Earn-Out Agreement. Following mediation, in April 2018, the Company and Holdings entered into a settlement agreement pursuant to which the Company agreed to release the $0.6 million of remaining funds held in escrow and to pay an additional $1.4 million to Holdings in lieu of any future payments under the Earn-Out Agreement (the "Taqua Settlement Agreement"). The Company paid the total amount due under the Taqua Settlement Agreement of $2.0 million in April 2018.

The transaction has been accounted for as a business combination and the financial results of Taqua have been included in the Company's consolidated financial statements for the period subsequent to its acquisition.

The Company finalized its valuation of the identifiable intangible assets in the second quarter of 2017. During the first quarter of 2017 and the fourth quarter of 2016, the Company recorded changes to the initial preliminary purchase price allocation. The primary adjustments in the first quarter of 2017 were a $0.4 million increase to current liabilities and a $0.1 million increase to noncurrent liabilities. During the fourth quarter of 2016, the Company recorded changes to the initial preliminary purchase price allocation. The primary adjustments recorded in the fourth quarter of 2016 were the aforementioned reversal of the $10 million of previously recorded contingent consideration, a reduction of $12.1 million to the developed technology intangible asset and an increase of $5.5 million to the customer relationship intangible asset. These adjustments, as well as other immaterial adjustments to other balance sheet accounts, resulted in a net reduction to goodwill of $2.2 million. Based on this final purchase price allocation, the Company recorded $9.6 million of goodwill, which is primarily due to expected synergies between the combined companies and expanded market opportunities resulting from the expanded product offering portfolio. The goodwill is deductible for tax purposes.

A summary of the final allocation of the purchase consideration for Taqua is as follows (in thousands):

Fair value of consideration transferred:	
Cash, net of cash acquired	$ 19,919
Fair value of assets acquired and liabilities assumed:	
Current assets	$ 3,347
Property and equipment	1,478
Intangible assets:	
Developed technology	2,100
Customer relationships	9,510
Goodwill	9,581
Other noncurrent assets	23
Current liabilities	(5,435)
Long-term liabilities	(685)
	$ 19,919

The valuation of acquired intangible assets is inherently subjective and relies on significant unobservable inputs. The Company used an income approach to value the acquired developed technology and customer relationship intangible assets. The valuation for each of these intangible assets was based on estimated projections of expected cash flows to be generated by the assets, discounted to the present value at discount rates commensurate with perceived risk. The valuation assumptions took into consideration the Company's estimates of technology attrition and revenue growth projections. The Company is amortizing the identifiable intangible assets in relation to the expected cash flows from the individual intangible assets over their respective useful lives (see Note 9).

The Company's revenue for the year ended December 31, 2016 included $1.9 million of revenue attributable to Taqua since the Taqua Acquisition Date. The inclusion of Taqua's operations for the period from the Taqua Acquisition Date to December 31, 2016 in the Company's financial results for the year ended December 31, 2016 increased the Company's loss by $4.7 million. The Company has not provided pro forma financial information, as the historical amounts were not significant to the Company's consolidated financial statements.

Acquisition- and Integration-Related Expenses

Acquisition- and integration-related expenses include those expenses related to acquisitions that would otherwise not have been incurred by the Company, including professional and services fees, such as legal, audit, consulting, paying agent and other fees, and expenses related to cash payments to certain former executives of the acquired businesses in connection with their employment agreements. Integration-related expenses represent incremental costs related to combining the Company and its business acquisitions, such as third-party consulting and other third-party services related to merging the previously separate companies' systems and processes. The acquisition- and integration-related expenses recorded in the year ended December 31, 2018 primarily related to the Merger, with nominal amounts related to the acquisition of Edgewater and other acquisition-related activities. The amounts recorded in the year ended December 31, 2017 primarily related to the Merger, with a nominal amount related to the acquisition of Taqua. The amount recorded in the year ended December 31, 2016 related to professional fees in connection with the acquisition of Taqua.

The components of acquisition- and integration-related costs incurred in the years ended December 31, 2018, 2017 and 2016 are were as follows (in thousands):

	Year ended December 31,		
	2018	2017	2016
Professional and services fees (acquisition-related)	$ 7,627	$ 11,916	$ 1,152
Management bonuses (acquisition-related)	1,972	931	—
Integration-related expenses	7,352	1,916	—
	$ 16,951	$ 14,763	$ 1,152

(4) EARNINGS (LOSS) PER SHARE

Basic earnings (loss) per share is computed by dividing net income (loss) by the weighted average number of shares outstanding during the period. For periods in which the Company reports net income, diluted net income per share is determined by using the weighted average number of common and dilutive common equivalent shares outstanding during the period unless the effect is antidilutive.

The calculations of shares used to compute basic and diluted loss per share are as follows (in thousands):

	Year ended December 31,		
	2018	2017	2016
Weighted average shares outstanding—basic	103,916	58,822	49,385
Potential dilutive common shares	—	—	—
Weighted average shares outstanding—diluted	103,916	58,822	49,385

Options to purchase the Company's common stock, unvested shares of restricted stock, unvested shares underlying performance-based stock grants and shares in connection with future purchases under the Company's Amended and Restated 2000 Employee Stock Purchase Plan, as amended (the "ESPP"), aggregating 3.1 million shares for the year ended December 31, 2018, 2.5 million shares for the year ended December 31, 2017 and 8.0 million shares for the year ended December 31, 2016 have not been included in the computation of diluted loss per share because their effect would have been antidilutive.

(5) CASH EQUIVALENTS AND INVESTMENTS

The Company invests in debt instruments, primarily U.S. government-backed, municipal and corporate obligations, which management believes to be high quality (investment grade) credit instruments.

During the year ended December 31, 2018, the Company sold $12.5 million of its available-for-sale securities, which it used for acquisition-related payments in connection with the Edgewater Acquisition and to support integration-related and restructuring activities in connection with the Merger. During the year ended December 31, 2017, the Company sold $51.6

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million of its available-for-sale securities, primarily to provide the cash consideration and other acquisition-related payments in connection with the Merger. During the year ended December 31, 2016, the Company sold $4.9 million of its available-for-sale securities. The Company recognized nominal gross gains and losses from the sales of these securities.

Investments with continuous unrealized losses for one year or greater at December 31, 2018 were nominal; however, since the Company does not intend to sell these securities and does not believe it will be required to sell any securities before they recover in value, it does not believe these declines are other-than-temporary.

On a quarterly basis, the Company reviews its investments to determine if there have been any events that could create a credit impairment. Based on its reviews, the Company does not believe that any impairment existed with its current holdings at December 31, 2018.

The amortized cost, gross unrealized gains and losses and fair value of the Company's cash equivalents and investments at December 31, 2018 and 2017 were comprised of the following (in thousands):

	December 31, 2018			
	Amortized cost	Unrealized gains	Unrealized losses	Fair value
Cash equivalents	$ 310	$ —	$ —	$ 310
Short-term investments				
U.S. government agency notes	$ 3,998	$ —	$ (9)	$ 3,989
Corporate debt securities	3,301	—	(6)	3,295
	$ 7,299	$ —	$ (15)	$ 7,284

	December 31, 2017			
	Amortized cost	Unrealized gains	Unrealized losses	Fair value
Cash equivalents	$ 1,254	$ —	$ —	$ 1,254
Short-term investments				
U.S. government agency notes	$ 4,091	$ —	$ (19)	$ 4,072
Corporate debt securities	8,048	—	(31)	8,017
Certificates of deposit	5,135	—	—	5,135
	$ 17,274	$ —	$ (50)	$ 17,224
Investments				
U.S. government agency notes	$ 3,992	$ —	$ (28)	$ 3,964
Corporate debt securities	3,908	—	(24)	3,884
Certificates of deposit	1,183	—	—	1,183
	$ 9,083	$ —	$ (52)	$ 9,031

The Company's available-for-sale debt securities that are classified as Investments in the consolidated balance sheet mature after one year but within two years or less from the balance sheet date. At December 31, 2018, the Company did not hold any investments that matured beyond one year.

Fair Value Hierarchy

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or a liability. The three-tier fair value hierarchy is based on the level of independent, objective evidence surrounding the inputs used to measure fair value. A financial instrument's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. The fair value hierarchy is as follows:

Level 1. Level 1 applies to assets or liabilities for which there are quoted prices in active markets for identical assets or liabilities.

Level 2. Level 2 applies to assets or liabilities for which there are inputs that are directly or indirectly observable in the marketplace, such as quoted prices for similar assets or liabilities in active markets or quoted prices for identical assets or liabilities in markets with insufficient volume or infrequent transactions (less active markets).

Level 3. Level 3 applies to assets or liabilities for which there are unobservable inputs to the valuation methodology that are significant to the measurement of the fair value of the assets or liabilities.

The following table shows the fair value of the Company's financial assets at December 31, 2018 and 2017. These financial assets are comprised of the Company's available-for-sale debt securities and reported under the captions Cash and cash equivalents, Short-term investments and Investments in the consolidated balance sheets (in thousands):

		Fair value measurements at December 31, 2018 using:		
	Total carrying value at December 31, 2018	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents	$ 310	$ 310	$ —	$ —
Short-term investments				
U.S. government agency notes	$ 3,989	$ —	$ 3,989	$ —
Corporate debt securities	3,295	—	3,295	—
	$ 7,284	$ —	$ 7,284	$ —

		Fair value measurements at December 31, 2017 using:		
	Total carrying value at December 31, 2017	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents	$ 1,254	$ 1,254	$ —	$ —
Short-term investments				
U.S. government agency notes	$ 4,072	$ —	$ 4,072	$ —
Corporate debt securities	8,017	—	8,017	—
Certificates of deposit	5,135	—	5,135	—
	$ 17,224	$ —	$ 17,224	$ —
Investments				
U.S. government agency notes	$ 3,964	$ —	$ 3,964	$ —
Corporate debt securities	3,884	—	3,884	—
Certificates of deposit	1,183	—	1,183	—
	$ 9,031	$ —	$ 9,031	$ —

The Company's marketable securities and investments have been valued with the assistance of valuations provided by third-party pricing services, as derived from such services' pricing models. Inputs to the models may include, but are not limited to, reported trades, executable bid and asked prices, broker/dealer quotations, prices or yields of securities with similar characteristics, benchmark curves or information pertaining to the issuer, as well as industry and economic events. The pricing services may use a matrix approach, which considers information regarding securities with similar characteristics to determine the valuation for a security. The Company is ultimately responsible for the consolidated financial statements and underlying

estimates. Accordingly, the Company assesses the reasonableness of the valuations provided by the third-party pricing services by reviewing actual trade data, broker/dealer quotes and other similar data, which are obtained from quoted market prices or other sources.

(6) ACCOUNTS RECEIVABLE, NET

Accounts receivable, net, consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Accounts receivable	$ 188,522	$ 165,229
Allowance for doubtful accounts	(669)	(73)
Accounts receivable, net	$ 187,853	$ 165,156

The Company's allowance for doubtful accounts activity was as follows (in thousands):

Year ended December 31,	Balance at beginning of year	Charges to expense	Charges (credits) to other accounts (deferred revenue)	Write-offs	Balance at end of year
2018	$ 73	$ 351	$ 620	$ (375)	$ 669
2017	$ 10	$ 154	$ (56)	$ (35)	$ 73
2016	$ 10	$ 10	$ —	$ (10)	$ 10

(7) INVENTORY

Inventory consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
On-hand final assemblies and finished goods inventories	$ 19,879	$ 18,374
Deferred cost of goods sold	3,798	4,569
	23,677	22,943
Less noncurrent portion (included in Other assets)	(1,075)	(1,640)
Current portion	$ 22,602	$ 21,303

(8) PROPERTY AND EQUIPMENT

Property and equipment consisted of the following (in thousands):

	Useful Life	December 31, 2018	December 31, 2017
Equipment	2-5 years	$ 76,423	$ 67,415
Software	2-5 years	24,707	21,977
Furniture and fixtures	3-5 years	1,490	1,892
Leasehold improvements	Shorter of the life of the lease or estimated useful life (1-5 years)	21,220	18,428
		123,840	109,712
Less accumulated depreciation and amortization		(96,798)	(84,932)
Property and equipment, net		$ 27,042	$ 24,780

The Company recorded depreciation and amortization expense related to property and equipment of $11.2 million for the year ended December 31, 2018, $8.5 million for the year ended December 31, 2017 and $8.0 million for the year ended December 31, 2016. During each of the years ended December 31, 2018, 2017 and 2016, the Company disposed of certain property and equipment that was fully depreciated at the time of disposal, which resulted in reductions in both Cost and Accumulated depreciation.

Property and equipment under capital leases included in the amounts above were as follows (in thousands):

	December 31, 2018	December 31, 2017
Cost	$ 2,979	$ 664
Less accumulated depreciation	(875)	(180)
Property and equipment under capital leases, net	$ 2,104	$ 484

The net book values of the Company's property and equipment by geographic area were as follows (in thousands):

	December 31, 2018	December 31, 2017
United States	$ 17,862	$ 17,576
Canada	4,076	1,740
Asia/Pacific	3,841	3,853
Europe	1,100	1,400
Other	163	211
	$ 27,042	$ 24,780

(9) INTANGIBLE ASSETS AND GOODWILL

The Company's intangible assets at December 31, 2018 and 2017 consisted of the following (in thousands):

December 31, 2018	Weighted average amortization period (years)	Cost	Accumulated amortization	Net carrying value
In-process research and development	*	$ 5,600	$ —	$ 5,600
Developed technology	6.91	182,880	63,187	119,693
Customer relationships	9.44	146,940	22,218	124,722
Trade names	5.20	2,000	624	1,376
Internal use software	3.00	730	730	—
	7.88	$ 338,150	$ 86,759	$ 251,391

December 31, 2017	Weighted average amortization period (years)	Cost	Accumulated amortization	Net carrying value
In-process research and development	*	$ 5,600	$ —	$ 5,600
Developed technology	6.90	153,380	24,211	129,169
Customer relationships	9.32	120,840	12,015	108,825
Trade names	3.00	900	80	820
Internal use software	3.00	730	730	—
	7.77	$ 281,450	$ 37,036	$ 244,414

* An in-process research and development intangible asset has an indefinite life until the product is generally available, at which time such asset is typically reclassified to developed technology.

Amortization expense for intangible assets for the years ended December 31, 2018, 2017 and 2016 was as follows (in thousands):

	Year ended December 31, 2018	2017	2016	Statement of operations classification
Developed technology	$ 38,976	$ 18,358	$ 6,038	Cost of revenue - product
Customer relationships	10,203	4,145	1,462	Sales and marketing
Trade names	544	80	—	Sales and marketing
	$ 49,723	$ 22,583	$ 7,500	

In connection with the preparation of its financial statements for the fourth quarter of 2017, the Company reviewed its intangible assets and other long-lived assets for impairment indicators. The Company determined that a triggering event had occurred relative to one of its developed technology intangible assets that had been previously acquired. During 2017, the Company discontinued its ongoing development of this technology and determined that there were no alternative uses of the technology within either its existing or future product lines. As a result, the Company recorded an impairment charge of $5.5 million to write down the carrying value of the asset to zero. This expense is included as a component of Cost of revenue - product in the table above and in the Company's consolidated statements of operations for the year ended December 31, 2017.

Estimated future amortization expense for the Company's intangible assets at December 31, 2018 was as follows (in thousands):

Years ending December 31,	
2019	$ 47,411
2020	46,552
2021	40,571
2022	34,156
2023	26,756
Thereafter	55,945
	$ 251,391

Goodwill is recorded when the consideration for an acquisition exceeds the fair value of net tangible and identifiable intangible assets acquired. The changes in the carrying value of the Company's goodwill in the years ended December 31, 2018 and 2017 were as follows (in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Balance at January 1		
Goodwill	$ 338,822	$ 52,499
Accumulated impairment losses	(3,106)	(3,106)
	335,716	49,393
Acquisition of Edgewater	48,053	—
Acquisition of GENBAND	—	285,825
Acquisition of Taqua and subsequent purchase accounting adjustments	—	498
Write-off of goodwill attributable to dissolved subsidiary	(114)	—
Balance at December 31	$ 383,655	$ 335,716

(10) ACCRUED EXPENSES

Accrued expenses consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Employee compensation and related costs	$ 42,852	$ 37,782
Professional fees	7,994	13,743
Deferred purchase consideration - Edgewater	15,000	—
Other	18,417	24,855
	$ 84,263	$ 76,380

(11) RESTRUCTURING ACCRUALS

The Company recorded restructuring expense aggregating $17.0 million in the year ended December 31, 2018, $9.4 million in the year ended December 31, 2017 and $2.7 million in the year ended December 31, 2016.

Merger Restructuring Initiative

In connection with the Merger, the Company's management approved a restructuring plan in the fourth quarter of 2017 to eliminate certain redundant positions and facilities within the combined companies (the "Merger Restructuring Initiative"). In connection with this initiative, the Company recorded $8.5 million of restructuring expense in 2017 for severance and related costs for approximately 120 employees. The Company recorded $16.1 million of additional restructuring expense in 2018 in connection with this initiative, comprised of $14.7 million for severance for approximately 275 additional employees and $1.4 million for redundant facilities in the Czech Republic, Canada and the U.S. as it continues to combine the two businesses and benefit from operational synergies. The Company believes that the severance payments for the currently recorded accruals will be paid in 2019 and that the payments related to restructured facilities will be completed in 2029, when the last of the leases for these restructured facilities expires. The Company anticipates it will record additional future expense in connection with this initiative for headcount and redundant facilities aggregating approximately $5 million.

Summaries of the Merger Restructuring Initiative accrual activity for the years ended December 31, 2018 and 2017 are as follows (in thousands):

Year ended December 31, 2018	Balance at January 1, 2018	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2018
Severance	$ 7,595	$ 14,735	$ (5)	$ (20,415)	$ 1,910
Facilities	—	1,399	—	(628)	771
	$ 7,595	$ 16,134	$ (5)	$ (21,043)	$ 2,681

Year ended December 31, 2017	Balance at January 1, 2017	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2017
Severance	$ —	$ 8,508	$ —	$ (913)	$ 7,595

Assumed Restructuring Initiative

The Company assumed GENBAND's previously recorded restructuring liability, totaling $4.1 million, on the Merger Date (the "GENBAND Restructuring Initiative"). Of this amount, $3.7 million related to severance and related costs and $0.4 million related to facilities. The Company recorded $0.9 million of restructuring expense in 2018 and a credit of $0.3 million credit to restructuring expense in 2017 for changes in estimated costs for this previously recorded and assumed restructuring initiative, primarily changes in negotiated severance to employees in certain international locations and changes in estimated sublease income for restructured facilities. The Company does not expect to record additional expense in connection with this initiative with the exception of any additional adjustments for changes in estimated costs. The Company expects that the payments related to this assumed liability will be completed in 2020.

Summaries of the GENBAND Restructuring Initiative accrual activity for the years ended December 31, 2018 and 2017 are as follows (in thousands):

Year ended December 31, 2018	Balance at January 1, 2018	Liability assumed in connection with Merger	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2018
Severance	$ 1,916	$ —	$ —	$ 487	$ (2,403)	$ —
Facilities	205	—	—	399	(487)	117
	$ 2,121	$ —	$ —	$ 886	$ (2,890)	$ 117

Year ended December 31, 2017	Balance at January 1, 2017	Liability assumed in connection with Merger	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2017
Severance	$ —	$ 3,663	$ —	$ (158)	$ (1,589)	$ 1,916
Facilities	—	431	—	(123)	(103)	205
	$ —	$ 4,094	$ —	$ (281)	$ (1,692)	$ 2,121

2016 Restructuring Initiative

In July 2016, the Company announced a program (the "2016 Restructuring Initiative") to further accelerate its investment in new technologies, as the communications industry migrates to a cloud-based architecture and as the Company pursues new strategic initiatives, such as new products and an expanded go-to-market footprint in selected geographies and discrete vertical markets. The Company recorded $2.0 million of restructuring expense in the aggregate in connection with this initiative, comprised of $1.9 million for severance and related costs and $0.1 million to abandon its facility in Rochester, New York (the "Rochester Facility"). The actions under the 2016 Restructuring Initiative have been implemented and accordingly, the Company does not expect to record additional expense in connection with this initiative. The amounts accrued for severance and related costs had been fully paid by the end of the third quarter of 2017. The Company expects that the amounts accrued for facilities will be paid by the end of October 2019, when the lease on the Rochester Facility expires.

In connection with the 2016 Restructuring Initiative, the Company recorded $0.5 million of restructuring expense in the year ended December 31, 2017, including adjustments for changes in estimated costs, comprised of $0.4 million for severance and related costs and $0.1 million related to the Company's Rochester Facility. The Company recorded $1.5 million of expense in the year ended December 31, 2016 related to headcount reductions.

Summaries of the 2016 Restructuring Initiative accrual activity for the years ended December 31, 2018 and 2017 are as follows (in thousands):

Year ended December 31, 2018	Balance at January 1, 2018	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2018
Facilities	$ 95	$ —	$ —	$ (37)	$ 58

Year ended December 31, 2017	Balance at January 1, 2017	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2017
Severance	$ 497	$ 405	$ (26)	$ (876)	$ —
Facilities	—	126	—	(31)	95
	$ 497	$ 531	$ (26)	$ (907)	$ 95

Taqua Restructuring Initiative

In connection with the acquisition of Taqua, the Company's management approved a restructuring plan in the third quarter of 2016 to eliminate certain redundant positions within the combined companies. On October 24, 2016, the Audit Committee of the Board of Directors of the Company approved a broader Taqua restructuring plan related to headcount and redundant facilities (both restructuring plans, the "Taqua Restructuring Initiative"). The Company recorded $1.8 million of restructuring expense in the aggregate in connection with this initiative, comprised of $1.2 million for severance and related costs and $0.6 million related to the elimination of redundant facilities, including adjustments recorded for changes in cost estimates for the planned restructuring activities. The actions under the Taqua Restructuring Initiative have been implemented and accordingly, the Company does not expect to record additional expense in connection with this initiative. The amounts accrued for severance and related costs had been fully paid by the end of the third quarter of 2017. The Company expects that the amounts accrued for facilities will be paid by the end of 2019.

In connection with the Taqua Restructuring Initiative, the Company recorded $0.7 million of restructuring expense, including adjustments for changes in estimated costs, in the year ended December 31, 2017, comprised of $0.2 million for severance and related costs and $0.5 million related to redundant facilities. The Company recorded $1.2 million of restructuring expense for this initiative in the year ended December 31, 2016, comprised of $1.0 million for severance and related costs and $0.2 million related to redundant facilities.

Summaries of the Taqua Restructuring Initiative accrual activity for the years ended December 31, 2018 and 2017 are as follows (in thousands):

Year ended December 31, 2018	Balance at January 1, 2018	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2018
Facilities	$ 365	$ —	$ —	$ (332)	$ 33

Year ended December 31, 2017	Balance at January 1, 2017	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at December 31, 2017
Severance	$ 384	$ 245	$ (49)	$ (580)	$ —
Facilities	218	508	—	(361)	365
	$ 602	$ 753	$ (49)	$ (941)	$ 365

Balance Sheet Classification

The current portions of accrued restructuring are included as a component of Accrued expenses in the consolidated balance sheets. The long-term portions of accrued restructuring are included as a component of Other long-term liabilities in the consolidated balance sheets. The long-term portions of accrued restructuring were $0.5 million at December 31, 2018 and $0.2 million at December 31, 2017. These amounts represent future lease payments on restructured facilities.

(12) DEBT

Proposed Offering of Convertible Senior Note

On November 13, 2018, the Company announced that it intended to offer, subject to market conditions and other factors, $150.0 million aggregate principal amount of convertible senior notes due 2023 in a private offering to qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended. The Company expected to grant the initial purchasers a 30-day option to purchase up to an additional $25.0 million aggregate principal amount of such notes, solely to cover over-allotments, if any. On that same day, the Company decided not to proceed with its previously-announced offering and consequently did not sell any securities as part of such offering. The Company believed that then-current market conditions were not conducive for an offering on terms that would be in the best interests of the Company's stockholders. In connection with this offering, the Company incurred $1.0 million of expense, primarily for professional fees, which is included as a component of General and administrative expense in the Company's consolidated statement of operations for the year ended December 31, 2018.

Assumed Senior Secured Credit Agreement

On the Merger Date and in connection with the Merger, the Company assumed GENBAND's Senior Secured Credit Agreement (the "Prior Credit Agreement" with Silicon Valley Bank ("SVB"), which had outstanding borrowings and letters of credit totaling $17.9 million and $2.9 million, respectively, and an average interest rate of 4.67%. GENBAND had entered into the Prior Credit Agreement with SVB effective July 1, 2016, with two of its operating subsidiaries as borrowers and GENBAND as the guarantor. The Prior Credit Agreement had a maturity date of July 1, 2019 and provided for revolving loans, including letters of credit and swingline loans, not to exceed $50 million in total, with potential further increases of $75 million available for a total revolving line of credit of up to $125 million. The Prior Credit Agreement was superseded by a Senior Secured Credit Facilities Credit Agreement, as amended, which was entered into on December 21, 2017 and is discussed below.

Senior Secured Credit Facility

On December 21, 2017, the Company entered into a Senior Secured Credit Facilities Credit Agreement (as amended, the “Credit Facility”) by and among the Company, as a guarantor, Sonus Networks, Inc., as the borrower (“Borrower”), SVB, as administrative agent (in such capacity, the “Administrative Agent”), issuing lender, swingline lender and lead arranger and the lenders party thereto (each referred to individually as a “Lender”, and collectively, the “Lenders”), which refinanced the Prior Credit Agreement. The Credit Facility includes $100 million of commitments, the full amount of which is available for revolving loans, a $15 million sublimit that is available for letters of credit and a $15 million sublimit that is available for swingline loans. The Credit Facility is scheduled to mature in December 2021, subject to a springing maturity if, on or before July 14, 2020, the existing promissory note issued to certain shareholders is not converted or extended to March 2022 or later. The Credit Facility contains procedures for additional financial institutions to become lenders or for any existing lender to increase its commitment under the facility, subject to an available increase of $50 million for all incremental commitments under the Credit Facility. On June 24, 2018, the Company amended the Credit Facility to, among other things, permit the Edgewater Acquisition and related transactions.

The indebtedness and other obligations under the Credit Facility are unconditionally guaranteed on a senior secured basis by the Company and each other material U.S. domestic subsidiary of the Company (collectively, the "Guarantors"). The Credit Facility is secured by first-priority liens on substantially all of the assets of the Borrower and the Guarantors, including the Company.

The Credit Facility requires periodic interest payments on outstanding borrowings until maturity. The Borrower may prepay all revolving loans under the Credit Facility at any time without premium or penalty (other than customary LIBOR breakage costs), subject to certain notice requirements.

Revolving loans under the Credit Facility bear interest at the Borrower's option at either the Eurodollar (LIBOR) rate plus a margin ranging from 2.50% to 3.00% per year or the base rate (the highest of the Federal Funds rate plus 0.50%, or the prime rate announced from time to time in The Wall Street Journal) plus a margin ranging from 1.50% to 2.00% per year (such margins being referred to as the "Applicable Margin"). The Applicable Margin varies depending on the Company's consolidated leverage ratio (as defined in the Credit Facility). The base rate and the LIBOR rate are each subject to a zero percent floor.

The Borrower is charged a commitment fee ranging from 0.25% to 0.40% per year on the daily amount of the unused portions of the commitments under the Credit Facility. Additionally, with respect to all letters of credit outstanding under the Credit Facility, the Borrower is charged a fronting fee of 0.125% per year and an outstanding letter of credit fee equal to the Applicable Margin for base rate loans ranging from 1.50% to 2.00% times the amount of the outstanding letters of credit.

The Credit Facility requires compliance with certain financial covenants, including a minimum consolidated quick ratio, minimum consolidated interest coverage ratio and maximum consolidated leverage ratio, all of which are defined in the Credit Facility and tested on a quarterly basis. In addition, the Credit Facility contains various covenants that, among other restrictions, limit the Company's and its subsidiaries' ability to enter into certain types of transactions, including, but not limited to: incurring or assuming indebtedness, making acquisitions or engaging in mergers, making investments, repurchasing equity and paying dividends, selling or otherwise transferring assets, changing the nature of its business and amending or making prepayments on certain junior debt. The Company was in compliance with all covenants of the Credit Facility as of December 31, 2018 and 2017.

The Credit Facility contains events of default that are customary for a secured credit facility. If an event of default relating to bankruptcy or other insolvency events with respect to a borrower occurs, all obligations under the Credit Facility will immediately become due and payable. If any other event of default exists under the Credit Facility, the lenders may accelerate the maturity of the obligations outstanding under the Credit Facility and exercise other rights and remedies, including charging a default rate of interest equal to 2.00% per year above the rate that would otherwise be applicable. In addition, if any event of default exists under the Credit Facility, the lenders may commence foreclosure or other actions against the collateral.

If any default exists under the Credit Facility, or if the Borrower is unable to make any of the representations and warranties as stated in the Credit Facility at the applicable time, the Borrower will be unable to borrow funds or have letters of credit issued under the Credit Facility, which, depending on the circumstances prevailing at that time, could have a material adverse effect on the Borrower's liquidity and working capital.

At December 31, 2018, the Company had an outstanding debt balance of $55.0 million at a weighted average interest rate of 5.96% and $2.7 million of outstanding letters of credit at an interest rate of 1.75% under the Credit Facility. At December 31, 2017, the Company had an outstanding debt balance of $20 million at an interest rate of 4.51% and $2.9 million of outstanding letters of credit at an interest rate of 2.00% under the Credit Facility.

Promissory Note

In connection with the Merger, on October 27, 2017, the Company issued a promissory note for $22.5 million to certain of GENBAND's equity holders (the "Promissory Note"). The Promissory Note does not amortize and the principal thereon is payable in full on the third anniversary of its execution. Interest on the Promissory Note is payable quarterly in arrears and

accrued at a rate of 7.5% per year for the first six months after issuance, and thereafter at a rate of 10% per year. The failure to make any payment under the Promissory Note when due and, with respect to payment of any interest, the continuation of such failure for a period of thirty days thereafter, constitutes an event of default under the Promissory Note. If an event of default occurs under the Promissory Note, the payees may declare the entire balance of the Promissory Note due and payable (including principal and accrued and unpaid interest) within five business days of the payees' notification to the Company of such acceleration. Interest that is not paid on the interest payment date will increase the principal amount of the Promissory Note. At December 31, 2018, the Promissory Note balance was $24.1 million, comprised of $22.5 million of principal, plus $1.6 million of interest converted to principal.

(13) LONG-TERM LIABILITIES

Long-term liabilities consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Capital lease obligations	$ 2,363	$ 837
Deferred rent	3,039	1,359
Restructuring	979	10,176
Pension obligations	7,006	7,524
Taxes payable	1,818	2,079
Deferred purchase consideration	30,000	—
Other	2,425	2,544
	47,630	24,519
Current portion	(16,833)	(11,330)
Long-term liabilities, net of current portion	$ 30,797	$ 13,189

The current portions of long-term liabilities are included as components of Accrued expenses and other in the Company's consolidated balance sheets.

(14) REVENUE RECOGNITION

Effective January 1, 2018, the Company adopted the New Revenue Standard using the modified retrospective option and identified the necessary changes to its policies, processes, systems and controls. Under the modified retrospective method, the Company is applying the New Revenue Standard to all contracts not yet completed as of January 1, 2018, recognizing in beginning Accumulated deficit an adjustment for the cumulative effect of the change and providing additional disclosures comparing results to those as if the Company was still following the previous accounting standards. Under ASC 605, the Company concluded it did not have VSOE for certain elements in software bundled arrangements, which resulted in revenue being recognized ratably over the longest performance period. Additionally, under ASC 606 for arrangements with certain customers that include acceptance criteria, revenue is recognized when the customer obtains control, as the Company believes acceptance is perfunctory. Under ASC 605, revenue was deferred until acceptance was received. The Company is also capitalizing incremental commission fees as a result of obtaining contracts and will amortizing the asset based on the transfer of services to which the asset relates, which is approximately five years. The cumulative effect of capitalizing commission fees was not material at January 1, 2018. In connection with the adoption of ASC 606, as of January 1, 2018, the Company recorded an adjustment to decrease Accumulated deficit by $12.2 million (net of tax, which was $0 due to the full valuation allowance).

The Company's typical performance obligations include the following:

Performance Obligation	When Performance Obligation is Typically Satisfied	When Payment is Typically Due
Software and Product Revenue		
Software licenses (perpetual or term)	Upon transfer of control; typically, when made available for download (point in time)	Generally, within 30 days of invoicing except for term licenses, which may be paid for over time
Software licenses (subscription)	Upon activation of hosted site (over time)	Generally, within 30 days of invoicing
Appliances	When control of the appliance passes to the customer; typically, upon delivery (point in time)	Generally, within 30 days of invoicing
Software upgrades	Upon transfer of control; typically, when made available for download (point in time)	Generally, within 30 days of invoicing
Customer Support Revenue		
Customer support	Ratably over the course of the support contract (over time)	Generally, within 30 days of invoicing
Professional Services		
Other professional services (excluding training services)	As work is performed (over time)	Generally, within 30 days of invoicing (upon completion of services)
Training	When the class is taught (point in time)	Generally, within 30 days of services being performed

Significant Judgments

The Company's contracts with customers often include promises to transfer multiple products and services to the customer. Determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together may require significant judgment.

Judgment is required to determine the standalone selling price for each distinct performance obligation. The Company typically has more than one SSP for individual products and services due to the stratification of those products and services by customers and circumstances. In these instances, the Company may use information such as the size of the customer and geographic region in determining the SSP.

Deferred Revenue

Deferred revenue is a contract liability representing amounts collected from or invoiced to customers in excess of revenue recognized. This results primarily from the billing of annual customer support agreements where the revenue is recognized over the term of the agreement. The value of deferred revenue will increase or decrease based on the timing of invoices and recognition of revenue.

Disaggregation of Revenue

The Company disaggregates its revenue from contracts with customers based on the nature of the products and services and the geographic regions in which each customer is domiciled.

RIBBON COMMUNICATIONS INC.
Notes to Consolidated Financial Statements (Continued)

The Company's total revenue for the years ended December 31, 2018, 2017 and 2016 was disaggregated geographically as follows:

Year ended December 31, 2018	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 169,510	$ 132,282	$ 35,832	$ 337,624
Europe, Middle East and Africa	37,833	46,856	11,794	96,483
Japan	23,108	11,234	5,069	39,411
Other Asia Pacific	30,575	12,321	4,358	47,254
Other	17,988	31,273	7,872	57,133
	$ 279,014	$ 233,966	$ 64,925	$ 577,905

Year ended December 31, 2017	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 121,121	$ 75,040	$ 22,896	$ 219,057
Europe, Middle East and Africa	23,352	17,471	3,742	44,565
Japan	10,252	10,282	3,855	24,389
Other Asia Pacific	14,693	5,901	1,952	22,546
Other	11,701	6,041	1,643	19,385
	$ 181,119	$ 114,735	$ 34,088	$ 329,942

Year ended December 31, 2016	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 100,589	$ 60,760	$ 12,630	$ 173,979
Europe, Middle East and Africa	21,073	10,769	2,021	33,863
Japan	12,258	9,831	3,524	25,613
Other Asia Pacific	8,226	3,478	827	12,531
Other	4,235	2,157	213	6,605
	$ 146,381	$ 86,995	$ 19,215	$ 252,591

The Company's product revenue from its direct sales program and from indirect sales through its channel partner program for the years ended December 31, 2018, 2017 and 2016 was as follows (in thousands):

	Year ended December 31, 2018	2017	2016
Indirect sales through channel program	$ 69,232	$ 43,138	$ 38,204
Direct sales	209,782	137,981	108,177
	$ 279,014	$ 181,119	$ 146,381

The Company's product revenue from sales to enterprise customers and from sales to service provider customers for the years ended December 31, 2018, 2017 and 2016 was as follows (in thousands):

	Year ended December 31,		
	2018	2017	2016
Sales to enterprise customers	$ 57,534	$ 35,592	$ 28,508
Sales to service provider customers	221,480	145,527	117,873
	$ 279,014	$ 181,119	$ 146,381

Revenue Contract Balances

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables, which are contract assets, and customer advances and deposits, which are contract liabilities, in the Company's consolidated balance sheets. Amounts are billed as work progresses in accordance with agreed-upon contractual terms, either at periodic intervals or upon achievement of contractual milestones. Completion of services and billing may occur subsequent to revenue recognition, resulting in contract assets. The Company may receive advances or deposits from its customers before revenue is recognized, resulting in contract liabilities which are classified as deferred revenue. These assets and liabilities are reported in the Company's consolidated balance sheets on a contract-by-contract basis as of the end of each reporting period. Changes in the contract asset and liability balances during the year ended December 31, 2018 were not materially impacted by any factors other than billing and revenue recognition. Nearly all of the Company's deferred revenue balance is related to services revenue, primarily customer support contracts. Unbilled receivables stem primarily from engagements where services have been performed; however, billing cannot occur until services are completed.

In some arrangements, the Company allows customers to pay for term-based software licenses and products over the term of the software license. The Company also sells SaaS-based software under subscription arrangements, with payment terms over the term of the SaaS agreement. Amounts recognized as revenue in excess of amounts billed are recorded as unbilled receivables. Unbilled receivables that are anticipated to be invoiced in the next twelve months are included in Accounts receivable on the Company's consolidated balance sheets. The changes in the Company's accounts receivable, unbilled receivables and deferred revenue balances for the year ended December 31, 2018 were as follows (in thousands):

	Accounts receivable	Unbilled accounts receivable	Deferred revenue (current)	Deferred revenue (long-term)
Balance at January 1, 2018	$ 149,122	$ 16,034	$ 100,571	$ 14,184
Increase (decrease), net	25,188	(2,491)	4,516	3,388
Balance at December 31, 2018	$ 174,310	$ 13,543	$ 105,087	$ 17,572

The increase in accounts receivable was primarily due to the Edgewater Acquisition. The increase in deferred revenue was primarily due to the Edgewater Acquisition. The Company recognized approximately $84 million of revenue in the year ended December 31, 2018 that was recorded as deferred revenue at December 31, 2017. Of the Company's deferred revenue reported as long-term in its consolidated balance sheet at December 31, 2018, the Company expects that approximately $12 million will be recognized as revenue in 2020, approximately $5 million will be recognized as revenue in 2021 and approximately $1 million will be recognized as revenue in 2022 and beyond.

The Company elected to adopt the practical expedient related to the presentation of shipping and handling costs. Accordingly, all freight-related customer invoicing is being recorded as revenue, while the shipping and handling costs that occur after control of the promised goods or services transfer to the customer are being reported as fulfillment costs as a component of Cost of revenue - product in the Company's consolidated statements of operations.

Deferred Commissions Cost

Sales commissions earned by the Company's employees are considered incremental and recoverable costs of obtaining a contract with a customer. Under ASC 605, the costs associated with obtaining a customer contract were expensed in the period the revenue was earned. Under ASC 606, these payments have been deferred on our consolidated balance sheet and are being amortized over the expected life of the customer contract, which is five years. At December 31, 2018, the Company had $2.7 million of deferred sales commissions capitalized.

Adoption of ASC 606

Under the modified retrospective method, the Company applied ASC 606 to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning January 1, 2018 are presented under ASC 606, and prior period amounts have not been adjusted and are reported in accordance with the Company's historical accounting treatment under ASC 605, *Revenue Recognition* ("ASC 605").

The Company recorded a net reduction to Accumulated deficit of $12.2 million (net of tax, which was $0 due to the full valuation allowance) at January 1, 2018 due to the cumulative impact of adopting ASC 606. Had the Company continued to recognize revenue under ASC 605, the Company would have recognized approximately $16 million less revenue in the year ended December 31, 2018. Incremental costs that would have been recognized had the Company continued to recognize revenue under ASC 605 would not have been material to the Company's consolidated results of operations.

(15) COMMON STOCK REPURCHASES

On July 29, 2013, Sonus announced that its Board of Directors had authorized a stock buyback program to repurchase up to $100 million of its common stock from time to time on the open market or in privately negotiated transactions. The timing and amount of any shares repurchased was determined by Sonus' management based on its evaluation of market conditions and other factors. The buyback program did not have a fixed expiration date but could be suspended or discontinued at any time. The buyback program was funded using Sonus' working capital. Ribbon did not assume the stock buyback program in connection with the Merger.

During the years ended December 31, 2018 and 2017, the Company did not repurchase any shares under the stock buyback program. During the year ended December 31, 2016, Sonus spent $9.5 million, including transaction fees, to repurchase and retire 1.3 million shares of its common stock under the buyback program.

(16) STOCK-BASED COMPENSATION PLANS

Amended and Restated Stock Incentive Plan

The Company's Amended and Restated Stock Incentive Plan (the "Plan"), provides for the award of options to purchase the Company's common stock ("stock options"), stock appreciation rights ("SARs"), restricted stock awards ("RSAs"), restricted stock units ("RSUs"), performance-based stock awards ("PSAs"), performance-based stock units ("PSUs") and other stock-based awards to employees, officers, directors (including those directors who are not employees or officers of the Company), consultants and advisors of the Company and its subsidiaries. In connection with the Merger, the Company assumed the Plan with all of its then-current terms and conditions.

At December 31, 2018, there were 3.5 million shares available for future issuance under the Plan.

2002 Stock Option Plan

In connection with the Edgewater Acquisition, the Company assumed Edgewater's Amended and Restated 2002 Stock Option Plan (the "Edgewater Plan") for all outstanding options as of the Edgewater Acquisition Date (the "Edgewater Options"). The Edgewater Options were converted to Ribbon stock options (the "Ribbon Replacement Options") using a conversion factor of 0.17, which was calculated based on the acquisition consideration of $1.20 per share of Edgewater common stock divided by the weighted average of the closing price of Ribbon common stock for the ten consecutive days ending with the trading day that preceded the Edgewater Acquisition Date. This conversion factor was also used to convert the exercise prices of the Edgewater Options to Ribbon Replacement Option exercise prices. The Ribbon Replacement Options are vesting under the same schedules as the respective Edgewater Options.

The fair values of the Edgewater Options assumed were estimated using a Black-Scholes option pricing model. The Company recorded $0.7 million as additional purchase consideration for the fair value of the Edgewater Options. The fair value of the Ribbon Replacement Options attributable to future service totaled $1.0 million, which is being recognized over a weighted average period of approximately two years.

2012 Stock Incentive Plan

In connection with the acquisition of PT, the Company assumed PT's 2012 Amended Performance Technologies, Incorporated Omnibus Incentive Plan, and subsequently renamed it the 2012 Stock Incentive Plan (the "2012 Plan"). In December 2014, all of the unissued shares under the 2012 Plan were transferred to the Plan. Any outstanding awards under the 2012 Plan that in the future expire, terminate, are canceled, surrendered or forfeited, or are repurchased by the Company will be returned to the Plan. Accordingly, at December 31, 2018, there were no shares available for future issuance under the 2012 Plan.

2008 Stock Incentive Plan

In connection with the acquisition of NET, the Company assumed NET's 2008 Equity Incentive Plan and subsequently renamed it the 2008 Stock Incentive Plan (the "2008 Plan"). In December 2014, all of the unissued shares under the 2008 Plan were transferred to the Plan. Any outstanding awards under the 2008 Plan that in the future expire, terminate, are canceled, surrendered or forfeited, or are repurchased by the Company will be returned to the Plan. Accordingly, at December 31, 2018 there were no shares available for future issuance under the 2008 Plan.

Treatment of Equity Awards in Connection with the Merger

In connection with the Merger, the Company accelerated the vesting of all outstanding stock options and certain outstanding full value awards. In addition, the vesting schedules of certain remaining unvested full value awards were adjusted. Such vesting and adjustments are described below:

Stock options - each stock option outstanding as of five business days prior to the Merger Date became vested in full as of that date (to the extent not previously vested), and the holders of such stock options were permitted to exercise their stock options from October 20, 2017 through October 24, 2017, after which date all remaining stock options, with certain exceptions, were canceled. The Company accelerated the vesting of 0.3 million stock options and subsequently canceled 4.5 million vested unexercised stock options in connection with this transaction. Any stock options granted under the 2008 Plan and 2012 Plan were not canceled, as these plans do not permit such cancellations. These stock options will continue to be outstanding until they are either exercised or expire.

RSAs and RSUs - as prescribed by the Company's Plan, any unvested RSAs and RSUs that were scheduled to vest within one year from the Merger Date became vested in full as of the Merger Date. The vesting schedules of the remaining unvested RSAs and RSUs were then accelerated by one year. Certain executives had specific terms and conditions related to their RSAs detailed in their employment agreements or amendments thereto (the "employment terms"). The accelerated vesting of and future vesting schedule adjustments to the RSAs held by these individuals were completed in accordance with their individual employment terms. In accordance with the terms of their RSA grants, unvested RSAs held by the then-current members of the Board of Directors were accelerated on a pro rata basis based on the amount of time the unvested RSAs were outstanding compared to the originally scheduled vesting date. Unvested PSUs granted to the Company's former President and Chief Executive Officer, who separated from the Company effective December 13, 2017 (the "former CEO"), were converted to RSAs in accordance with his employment terms; certain of those converted grants were accelerated, and the remaining RSAs would continue to vest according to their terms, but with the elimination of any required satisfaction of the performance metrics associated with the awards when they were originally granted as PSUs. In total, the Company accelerated the vesting of and released 1.1 million RSAs and approximately 36,000 RSUs in connection with the Merger.

PSUs - any unvested PSUs were accelerated in accordance with the employment agreement of each individual PSU holder. The remaining unvested units would continue to vest according to their terms, with the exception of the PSU grants held by the former CEO, as discussed above. The Company accelerated the vesting of and released approximately 98,000 PSUs in connection with the Merger.

Executive Equity Arrangements

Stock-for-Cash Bonus Election

In connection with the Company’s annual incentive program, certain executives of the Company were given the choice to receive a portion, ranging from 10% to 50% (the "Elected Percentage") of their fiscal year 2018 bonuses (the “2018 Bonus”), if any were earned, in the form of shares of the Company’s common stock (the “2018 Bonus Shares” and such program, the “Stock Bonus Election Program”). Each executive could also elect not to participate in this program and to earn his or her 2018 Bonus, if any, in the form of cash. Any executive who elected to receive a portion of his or her 2018 Bonus in stock would also receive an uplift of 20% of the value of the 2018 Bonus Shares in additional shares of the Company’s common stock (the “Uplift Shares”), with the exception of the Company’s Chief Executive Officer and his senior leadership team. Under the Stock Bonus Election Program, the amount of the 2018 Bonus, if any, for each executive will be determined by the Compensation Committee of the Board of Directors (the "Compensation Committee"). The Company expects to grant the 2018 Bonus Shares and Uplift Shares on a date concurrent with the timing of the payout of the cash portion of the 2018 Bonus, if any is earned. The 2018 Bonus Shares and Uplift Shares will be fully vested on the grant date; however, each executive is restricted from trading the 2018 Bonus Shares and Uplift Shares for five months after the date of grant.

The number of shares of the Company’s common stock that will be granted to those executives who elected to participate in the Stock Bonus Program but are not eligible for the Uplift Shares will be calculated by multiplying the amount of their 2018 Bonus by their individual 2018 Bonus Shares percentage election, divided by the closing price of the Company’s common stock on the date of grant. The number of shares of the Company’s common stock that will be granted to those executives who elected to participate in the Stock Bonus Program and are eligible for the Uplift Shares will be calculated by multiplying the amount of their 2018 Bonus by their Elected Percentage times 1.2, divided by the closing price of the Company’s common stock on the date of grant. Under the Stock Bonus Election Program, an executive's eligibility to receive the 2018 Bonus Shares and Uplift Shares, if any, is contingent upon the executive’s continued employment with the Company through the date of grant.

The Company determined that the grant date criteria for the 2018 Bonus Shares and Uplift Shares had not been met as of December 31, 2018, as the number of shares to be granted to each executive had not been determined. The Company recorded stock-based compensation expense totaling $1.1 million in connection with the Stock Bonus Program in 2018 and recorded a liability in connection with the future issuance of the 2018 Bonus Shares and Uplift Shares. The Company will reclassify the liability to equity at the time the shares are granted, if any.

Performance-Based Stock Grants

In addition to granting RSAs and RSUs to its executives and certain of its employees, the Company also grants PSUs to certain of its executives.

In May 2018, the Company granted its President and Chief Executive Officer, Franklin (Fritz) Hobbs (“Mr. Hobbs”), 195,000 PSUs with both performance and service conditions (the “2018 PSUs”). Of the 195,000 2018 PSUs, one-half each would vest based on the achievement of two separate metrics related to the Company’s 2018 financial performance (the “2018 Performance Conditions”). The Company’s achievement of the 2018 Performance Conditions (and the shares of Company common stock to vest as a result thereof) were measured on a linear sliding scale in relation to specific threshold, target and stretch performance conditions. The number of shares of common stock to be received upon vesting of the 2018 PSUs would in no event exceed 150% of the 2018 PSUs. In the year ended December 31, 2018, the Company recorded stock-based compensation expense for the 20018 PSUs based on its assessment of the probability that each performance condition would be achieved and the level, if any, of such achievement. The Company recorded $0.3 million of stock-based compensation expense in the year ended December 31, 2018 in connection with the 2018 PSUs. In February 2019, the Compensation Committee determined that the performance metrics for one-half of the 2018 PSUs had been achieved at the 106.49% achievement level and one-half of the 2018 PSUs had been achieved at the 150% level, for a total of 250,075 shares earned, pending Mr. Hobbs' continued employment with the Company through December 31, 2020, the vesting date of the 2018 PSUs (collectively, the "2018 Shares Earned"). The unamortized expense for the 2018 Shares Earned will be recorded through the remainder of the service period. The grant of the 2018 PSUs is recorded in the PSU table below.

From 2015 through 2017, the Company granted PSUs with both market and service conditions to certain of its executives. The terms of each PSU grant were such that up to one-third of the shares subject to the respective PSU grant would vest, if at all, on each of the respective first, second and third anniversaries of the date of grant, depending on the Company's total shareholder return ("TSR") compared to the TSR of the companies included in the Nasdaq Telecommunications Index for the same fiscal year, measured by the Compensation Committee after each of the fiscal years as defined by each grant (each, a "Performance Period"). The shares determined to be earned would vest on the anniversary of the grant date following each Performance Period. Shares subject to the PSUs that failed to be earned would be forfeited.

The PSUs that included a market condition required the use of a Monte Carlo simulation approach to model future stock price movements based upon the risk-free rate of return, the date of return, the volatility of each entity and the pair-wise covariance between each entity. These results were then used to calculate the grant date fair values of the respective PSUs. The Company is required to record expense for the PSUs with market conditions through their respective final vesting dates regardless of the number of shares that are ultimately earned.

On March 31, 2017, the Company granted an aggregate of 165,000 PSUs with both market and service conditions to five of its executives (the "2017 PSUs") In March 2018, the Compensation Committee determined that the performance metrics for the 2017 PSUs for the 2017 Performance Period had been achieved at the 130% level and accordingly, 33,584 shares in the aggregate were released to the three remaining executives holding such outstanding grants, comprised of 25,834 shares, representing the 100% achievement target, granted on March 31, 2017 and 7,750 shares, representing the 30% achievement over target, granted on March 31, 2018. The grant of the additional shares and the release of the earned shares, both of which occurred on March 31, 2018, are included in the PSU table below. In February 2019, the Compensation Committee determined that the performance metrics for the 2017 PSUs for the 2018 Performance Period had been achieved at the 61.4% level and accordingly, 9,464 shares will be released to the three remaining executives holding such outstanding grants on March 31, 2019, subject to their continued employment with the Company through that date.

On April 1, 2016, the Company granted an aggregate of 131,250 PSUs with both market and service conditions to six of its executives (the "2016 PSUs"). In March 2018, the Compensation Committee determined that the performance metrics for the 2016 PSUs for the 2017 Performance Period had been achieved at the 130% level, and accordingly, 16,250 shares in the aggregate were released to the two remaining executives holding such outstanding grants, comprised of 12,500 shares, representing the 100% achievement target, granted on April 1, 2016 and 3,750 shares, representing the 30% achievement over target, granted on April 1, 2018. The grant of the additional shares and the release of the earned shares, both of which occurred on April 1, 2018, are included in the PSU table below. In February 2017, the Compensation Committee determined that the performance metrics for the 2016 PSUs for the 2016 Performance Period had been achieved at the 90.4% level, and accordingly, 24,106 shares in the aggregate were released to the four executives holding such outstanding grants on March 16, 2017. The unearned shares relating to the 2016 Performance Period, aggregating 2,560 shares, were forfeited on March 16, 2017. At December 31, 2018, there were no unvested 2016 PSUs outstanding.

On March 16, 2015, the Company granted an aggregate of 131,250 PSUs with both market and service conditions to eight of its executives (the "2015 PSUs"). In March 2018, the Compensation Committee determined that the performance metrics for the 2015 PSUs for the 2017 Performance Period had been achieved at the 112% level, and accordingly, 7,934 shares in the aggregate were released to the two remaining executives holding such outstanding grants, comprised of 7,084 shares, representing the 100% achievement target, granted on March 16, 2015 and 850 shares, representing the 12% achievement over target, granted on March 16, 2018. The grant of the additional shares and the release of the earned shares, both of which occurred on March 16, 2018, are included in the PSU table below. In February 2017, the Compensation Committee determined that the performance metrics for the 2015 PSUs for the 2016 Performance Period had been achieved at the 76.0% level, and accordingly, 23,750 shares in the aggregate were released to the four remaining executives holding such outstanding grants on April 1, 2017. The unearned shares relating to the 2016 Performance Period, aggregating 7,500 shares, were forfeited on April 1, 2017. At December 31, 2018, there were no unvested 2015 PSUs outstanding.

In connection with the Merger, as previously described above, PSUs held by the former CEO were converted to RSAs and certain other PSUs were accelerated and released in accordance with the individual employment terms of each PSU grantee. The vesting schedules of the remaining unvested PSUs were adjusted to continue to vest on their terms.

On December 14, 2017, the Company announced that, on and effective December 13, 2017, the Board of Directors appointed Franklin (Fritz) W. Hobbs as the Company's President and Chief Executive Officer, and the former CEO resigned his position as the Company's President and Chief Executive Officer and as a member of the Board of Directors. In connection

with the separation of the former CEO from the Company and in accordance with his employment agreement with the Company, as amended, the Company accelerated the vesting of his then-unvested RSAs (including those that had been converted from PSUs in connection with the Merger, as described above). These shares are reported as "Vested" in the RSA table below. However, due to the terms of the former CEO's separation agreement with the Company and applicable employment laws, the shares were not released until January 2018. Accordingly, these shares were not considered outstanding as of December 31, 2017.

Stock Options

Options are issued to purchase shares of common stock of the Company at prices that are equal to the fair market value of the shares on the date the option is granted. Options granted under the Stock Plan expire ten years from the date of grant. Outstanding options under the Edgewater Plan expire ten years from the date of grant. Outstanding options under the 2008 Plan expire either seven or ten years from the date of grant. Outstanding options under the 2012 Plan expire ten years from the date of grant. The grant date fair value of options, adjusted for estimated forfeitures, is recognized as expense on a straight-line basis over the requisite service period, which is generally the vesting period. Forfeitures are estimated based on historical experience.

The activity related to the Company's outstanding stock options during the year ended December 31, 2018 was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value (in thousands)
Outstanding at January 1, 2018	435,187	$ 14.71		
Granted	—	$ —		
Edgewater outstanding options converted to Ribbon options	312,452	$ 1.97		
Exercised	(15,935)	$ 4.58		
Forfeited	(35,431)	$ 1.81		
Expired	(114,212)	$ 14.33		
Outstanding at December 31, 2018	582,061	$ 9.01	4.82	$ 774
Vested or expected to vest at December 31, 2018	560,325	$ 9.27	4.67	$ 720
Exercisable at December 31, 2018	428,097	$ 11.47	3.60	$ 366

The Company did not grant options during the year ended December 31, 2018. The grant date fair values of options to purchase common stock granted in the years ended December 31, 2017 and 2016 were estimated using the Black-Scholes valuation model with the following assumptions:

	Year ended December 31, 2017	2016
Risk-free interest rate	1.22% - 1.95%	1.00% - 1.61%
Expected dividends	—	—
Weighted average volatility	51.1%	54.8%
Expected life (years)	5.0	5.0-10.0

The risk-free interest rate used is the average U.S. Treasury Constant Maturities Rate for the expected life of the award. The expected dividend yield of zero is based on the fact that the Company has never paid dividends and has no present intention to pay cash dividends. The expected life for stock options is based on a combination of the Company's historical option patterns and expectations of future employee actions.

The weighted average grant-date fair values of options granted were $3.05 for the year ended December 31, 2017 and $4.39 for the year ended December 31, 2016.

The total intrinsic values of options exercised were approximately $39,000 for the year ended December 31, 2018, $0.2 million for the year ended December 31, 2017 and approximately $42,000 for the year ended December 31, 2016.

The Company received cash from option exercises of $0.1 million in the year ended December 31, 2018, $0.6 million in the year ended December 31, 2017 and $0.2 million in the year ended December 31, 2016.

Restricted Stock Grants - Restricted Stock Awards and Restricted Stock Units

The Company's outstanding restricted stock grants consist of both RSAs and RSUs. Holders of unvested RSAs have voting rights and rights to receive dividends, if declared; however, these rights are forfeited if the underlying unvested RSA shares are forfeited. Holders of unvested RSUs do not have such voting and dividend rights. The grant date fair value of restricted stock grants, adjusted for estimated forfeitures, is recognized as expense on a straight-line basis over the requisite service period. The fair value of restricted stock grants is determined based on the market value of the Company's shares on the date of grant.

The activity related to the Company's RSAs for the year ended December 31, 2018 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2018	1,696,582	$ 7.68
Granted	1,123,956	$ 6.90
Vested	(1,035,952)	$ 8.05
Forfeited	(276,575)	$ 7.36
Unvested balance at December 31, 2018	1,508,011	$ 6.90

The activity related to the Company's RSUs for the year ended December 31, 2018 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2018	17,932	$ 6.90
Granted	908,300	$ 6.27
Vested	(242,110)	$ 5.57
Forfeited	(47,822)	$ 6.76
Unvested balance at December 31, 2018	636,300	$ 6.52

The total fair value of vested restricted stock grant shares was $9.7 million in the year ended December 31, 2018, $19.1 million in the year ended December 31, 2017 and $10.1 million in the year ended December 31, 2016.

Performance-Based Stock Units

Holders of unvested PSUs do not have voting and dividend rights. The Company recognizes stock-based compensation expense for PSUs without market conditions on a straight-line basis, with the amount recorded based upon the expected level of achievement as of each period-end, recording cumulative adjustments in the period when the expected level of achievement changes. The Company recognizes the grant date fair value of PSUs on a graded attribution basis through the vest date of the respective awards so long as it remains probable that the related service conditions will be satisfied.

The activity related to the Company's PSUs for the year ended December 31, 2018 was as follows:

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	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2018	60,834	$ 9.65
Granted	207,350	$ 5.78
Vested	(57,768)	$ 9.90
Forfeited	—	$ —
Unvested balance at December 31, 2018	210,416	$ 5.77

The total fair value of vested performance-based stock grant shares was $0.6 million in the year ended December 31, 2018, $1.4 million in the year ended December 31, 2017 and $0.2 million in the year ended December 31, 2016.

ESPP

The ESPP is designed to provide eligible employees of the Company and its participating subsidiaries an opportunity to purchase common stock of the Company through accumulated payroll deductions.

The ESPP provides for six-month consecutive offering periods, with the purchase price of the stock equal to 85% of the lesser of the market price on the first or last day of the offering period. The maximum number of shares of common stock an employee may purchase during each offering period is 500, subject to certain adjustments pursuant to the ESPP.

In May 2017, the Compensation Committee determined to suspend all offering periods under the ESPP, effective September 1, 2017, until such time after the Merger Date as the Compensation Committee determined was best in its sole discretion. The Company's Board of Directors voted to re-implement the ESPP effective December 1, 2018 for employees in certain geographic regions, with the first purchase date of the re-implemented ESPP scheduled for May 31, 2019.

At December 31, 2018, 5.0 million shares, the maximum number of shares that may be issued under the ESPP, were authorized, and 1.4 million shares were available under the ESPP for future issuance.

Stock-Based Compensation

The consolidated statements of operations included stock-based compensation for the years ended December 31, 2018, 2017 and 2016 as follows (in thousands):

	Year ended December 31, 2018	2017	2016
Product cost of revenue	$ 114	$ 514	$ 359
Service cost of revenue	345	1,448	1,314
Research and development	1,797	7,337	5,014
Sales and marketing	2,935	4,885	6,209
General and administrative	5,881	11,473	6,872
	$ 11,072	$ 25,657	$ 19,768

There was no income tax benefit for employee stock-based compensation expense for the years ended December 31, 2018, 2017 and 2016 due to the valuation allowance recorded.

Stock-based compensation expense recorded for the year ended December 31, 2017 included $8.6 million of incremental expense related to the acceleration of stock options and full value awards and subsequent adjustments to the vesting schedules of the remaining unvested full value awards in connection with the Merger. In addition, the Company recorded $1.6 million of incremental expense related to the accelerated vesting of RSAs held by the former CEO in connection with his separation from the Company effective December 13, 2017. These incremental amounts were all recorded in the fourth quarter of 2017.

During the three months ended March 31, 2017, the Company reversed $1.0 million of incremental expense to correct an error in 2016 related to the acceleration of certain stock awards held by an executive who separated from the Company in 2016. Management had reviewed and considered the impact of the error and determined that it was not material to the Company's consolidated financial results for the third and fourth quarters of 2016, as well as the 2016 fiscal year. Management has also determined that the correction of this error is not material to the results of operations for the 2017 reporting periods.

At December 31, 2018, there was $10.7 million, net of expected forfeitures, of unrecognized stock-based compensation expense related to unvested stock options, RSAs, RSUs, PSUs and the ESPP. This expense is expected to be recognized over a weighted average period of approximately two years.

Common Stock Reserved

Common stock reserved for future issuance at December 31, 2018 consists of the following:

Amended and Restated Stock Incentive Plan	3,501,214
ESPP	1,431,513
	4,932,727

The Company's policy is to issue authorized but unissued shares upon the exercise of stock options, to grant restricted common stock, to settle restricted stock units and performance-based stock units, and to authorize the purchase of shares of the Company's common stock under the ESPP.

(17) EMPLOYEE DEFINED CONTRIBUTION PLANS

The Company offers 401(k) savings plans to eligible employees. In June 2016, at the recommendation of the Compensation Committee, the Company’s Board of Directors elected to reinstate a discretionary limited 401(k) match program of up to $2,000 per year ($1,000 per each half-year) per eligible employee, contingent upon the Company’s achievement of certain financial metric targets set by the Compensation Committee. The matching contribution became effective July 1, 2016.

The Company assumed GENBAND's 401(k) savings plan in connection with the Merger.

Effective January 1, 2019, the previously separate former Sonus and former GENBAND 401(k) savings plans were combined into one plan.

Effective January 1, 2018, the Company began to match 50% of each employee's contributions to the 401(k) program up to 4% of the employee's eligible earnings, for a maximum match of 2% of eligible earnings.

The Company recorded expense related to its employee defined contribution plans aggregating $3.2 million in the year ended December 31, 2018, $1.4 million in the year ended December 31, 2017 and $0.6 million in the year ended December 31, 2016.

(18) NON-U.S. EMPLOYEE DEFINED BENEFIT PLANS

In connection with the Merger, the Company assumed GENBAND's defined benefit retirement plans that cover some employees at various international locations. The Company adopted GENBAND's policy to contribute amounts at least sufficient to satisfy the minimum amount required by applicable law and regulations, or to directly pay benefits where appropriate. Benefits under the defined benefit plans are typically based either on years of service and the employee's compensation (generally during a fixed number of years immediately before retirement) or on annual credits. The range of assumptions that are used for the non-U.S. defined benefit plans reflect the different economic environments within the various countries.

During the year ended December 31, 2018, in conjunction with the Merger Restructuring Initiative, there were reductions in force that significantly reduced benefits that can be earned under the plans in several international locations that resulted in curtailment accounting. A curtailment gain of $0.5 million was recognized in 2018 and included as a component of Other (expense) income, net, in the Company's consolidated statement of operations. In the year ended December 31, 2018, settlement accounting was triggered in only one of these locations, resulting in an immaterial settlement charge.

A reconciliation of the changes in the benefit obligations and fair value of the assets of the defined benefit plans for the year ended December 31, 2018 and for the period from the Merger Date to December 31, 2017, the funded status of the plans and the amounts recognized in the consolidated balance sheets as of December 31, 2018 and 2017 were as follows (in thousands):

	Year ended December 31, 2018	October 27, 2017 to December 31, 2017
Changes in projected benefit obligations:		
Projected benefit obligation, beginning of period	$ 11,484	$ 10,515
Service cost	449	68
Interest cost	150	25
Participant contributions	5	5
Benefits paid	(23)	(3)
Net actuarial loss on obligation	(414)	562
Curtailment	(553)	—
Settlement	(250)	—
Currency loss	—	312
Projected benefit obligation, end of year	$ 10,848	$ 11,484
Changes in plan assets:		
Fair value of plan assets, beginning of period	$ 3,893	$ 3,776
Actual return on plan assets	(53)	(8)
Employer contributions	292	22
Participant contributions	5	5
Administrative expenses	(22)	(4)
Benefits paid	(273)	(3)
Currency gain	—	105
Fair value of plan assets, end of year	$ 3,842	$ 3,893
Funded status at end of year	$ (7,006)	$ (7,591)
Amounts recognized in accumulated other comprehensive loss consist of:		
Net actuarial loss	$ 222	$ 578
Amounts recognized in the consolidated balance sheets consist of:		
Accrued expenses and other (current pension liability)	$ (75)	$ (67)
Other long-term liabilities (non-current pension liability)	(6,931)	(7,524)
Net amount recognized	$ (7,006)	$ (7,591)

Plans with underfunded or non-funded accumulated benefit obligations at December 31, 2018 and 2017 were as follows (in thousands):

	December 31, 2018	December 31, 2017
Aggregate projected benefit obligation	$ 10,848	$ 11,484
Aggregate accumulated benefit obligation	$ 7,152	$ 7,793
Aggregate fair value of plan assets	$ 3,842	$ 3,893

Net periodic benefit costs for the year ended December 31, 2018 and the period from the Merger Date to December 31, 2017 were as follows (in thousands):

	Year ended December 31, 2018	October 27, 2017 to December 31, 2017
Service cost	$ 449	$ 68
Interest cost	150	25
Expected return on plan assets	(45)	(8)
Plan asset expenses	22	4
Curtailment gain	(510)	—
Settlement loss	3	—
Net periodic benefit costs	$ 69	$ 89

The Company made benefit payments of $273,000 in the year ended December 31, 2018, including $250,000 of one-time lump sum payments to participants, and $3,000 in the period from the Merger Date to December 31, 2017. Expected benefit payments for the next ten years are as follows:

Years ending December 31,	
2019	$ 75
2020	45
2021	94
2022	47
2023	231
2024 to 2028	643
	$ 1,135

The changes in plan assets and benefit obligations recognized in other comprehensive income (loss) before tax for the year ended December 31, 2018 and the period from the Merger Date to December 31, 2017 were as follows (in thousands):

	Year ended December 31, 2018	October 27, 2017 to December 31, 2017
Net (gain) loss	$ (356)	$ 578

The Company defers all actuarial gains and losses resulting from variances between actual results and economic estimates or actuarial assumptions. The unrecognized actuarial gains and losses are recorded as unrealized pension actuarial gains (losses) in the Company's consolidated balance sheets as a component of Accumulated other comprehensive income. These unrecognized gains and losses are amortized as a component of net periodic benefit cost when the net gains and losses exceed 10% of the greater of the market value of plan assets or the projected benefit obligation at the beginning of the year. Amortization of the amount included in Accumulated other comprehensive income into net periodic benefit cost is expected to total $4,000 for the year ended December 31, 2019.

The principal weighted average assumptions used to determine the benefit obligation at December 31, 2018 and 2017 were as follows:

	December 31, 2018	December 31, 2017
Discount rate	1.30%	1.31%
Rate of compensation increase	2.83%	3.38%

The principal weighted average assumptions used to determine net period benefit cost for the year ended December 31, 2018 and the period from the Merger Date to December 31, 2017 were as follows:

	Year ended December 31, 2018	October 27, 2017 to December 31, 2017
Discount rate	1.50%	1.49%
Expected long-term return on plan assets	1.34%	1.23%
Rate of compensation increase	3.38%	3.38%

Assumed discount rates are used in the measurement of the projected and accumulated benefit obligations, as well as the service and interest cost components of net periodic pension cost. Estimated discount rates reflect the rates at which the pension benefits could be effectively settled. For each defined benefit plan, the Company chooses an estimated discount rate from a readily available market index rate, based upon high-quality fixed income investments, specific to the country or economic zone in which the benefits are paid and taking into account the duration of the plan and the number of participants.

The plans in the Netherlands and Switzerland are funded through insurance contracts, which provide guaranteed interest credit. The fair value of the contract is derived from the insurance company's assessment of the minimum value of the benefits provided by the insurance contract. The methodology used to value the plan assets assumes that the value of the plan assets equals the guaranteed insured benefits. For consistency, the same discount rate used in the valuation of the benefit obligations is used to place a value on the plan assets. The assets are assumed to grow each year in line with the discount rate, and therefore, the expected return on the assets is set equal to the discount rate. The fair value of the combined plan assets was $3.8 million at December 31, 2018 and $3.9 million at December 31, 2017. The Company classifies the fair value of these plan assets as Level 2 in the fair value hierarchy as discussed in Note 5.

During the year ended December 31, 2018, employees in the Netherlands and Switzerland made contributions to the respective pension plans aggregating $5,000. During the period from the Merger Date to December 31, 2017, employees in the Netherlands and Switzerland made contributions to the respective plans aggregating $5,000. Employee contributions to these plans are based on a fixed 5% of the relevant pensionable earnings. The Company funds these plans by contributing at least the minimum amount required by applicable regulations and as recommended by an independent actuary. During the year ended December 31, 2018, the Company contributed $292,000 to its pension plans. During the period from the Merger Date to December 31, 2017, the Company contributed $22,000 to its pension plans. The Company expects to contribute $0.2 million to its pension plans in 2019.

(19) INCOME TAXES

The components of loss from continuing operations before income taxes consisted of the following (in thousands):

	Year ended December 31,		
	2018	2017	2016
Income (loss) before income taxes:			
United States	$ (52,569)	$ (55,932)	$ (11,973)
Foreign	(20,841)	2,240	557
	$ (73,410)	$ (53,692)	$ (11,416)

The provision (benefit) for income taxes from continuing operations consisted of the following (in thousands):

	Year ended December 31,		
	2018	2017	2016
Provision (benefit) for income taxes:			
Current:			
Federal	$ 561	$ (200)	$ 12
State	128	115	24
Foreign	2,198	1,960	1,378
Total current	2,887	1,875	1,414
Deferred:			
Federal	(8,481)	49,570	(301)
State	(1,414)	(4,833)	(1,007)
Foreign	(1,477)	(816)	338
Change in valuation allowance	11,885	(64,236)	2,072
Total deferred	513	(20,315)	1,102
Total	$ 3,400	$ (18,440)	$ 2,516

A reconciliation of the Company's effective tax rate for continuing operations to the statutory federal rate is as follows:

	Year ended December 31,		
	2018	2017	2016
U.S. statutory income tax rate	21.0 %	35.0%	35.0 %
State income taxes, net of federal benefit	(0.1)	1.2	—
Foreign income taxes	(5.7)	(0.5)	(7.9)
Foreign tax audit	—	—	(5.2)
Acquisition costs	(0.3)	(6.0)	—
Foreign deemed dividends	(3.4)	(3.8)	(5.0)
Stock-based compensation	(0.3)	26.8	(38.9)
Tax credits	0.6	(33.3)	11.6
Uncertain tax positions	1.3	(1.2)	—
NOL and credit limitations	—	(18.9)	—
Valuation allowance	(16.1)	29.0	(1.9)
Goodwill amortization	0.3	(1.7)	(6.7)
Meals and entertainment	(0.4)	(0.5)	(1.4)
Tax reform	—	8.8	—
Other, net	(1.5)	(0.6)	(1.6)
Effective income tax rate	(4.6)%	34.3%	(22.0)%

The following is a summary of the significant components of deferred income tax assets and liabilities (in thousands):

	December 31,	
	2018	2017
Assets:		
Net operating loss carryforwards	$ 76,278	$ 58,624
Research and development tax credits	28,664	24,499
Deferred revenue	5,755	5,886
Accrued expenses	9,601	10,786
Inventory	4,906	5,980
Stock-based compensation	1,536	727
Fixed assets	7,716	7,452
Other temporary differences	1,943	1,556
	136,399	115,510
Valuation allowance	(101,484)	(89,600)
Total deferred tax assets	34,915	25,910
Liabilities:		
Purchased intangible assets	(26,014)	(17,092)
Unremitted foreign income	(4,487)	(3,171)
Total deferred tax liabilities	(30,501)	(20,263)
Total net deferred tax assets	$ 4,414	$ 5,647
The deferred tax assets and liabilities based on tax jurisdictions are presented in the Company's consolidated balance sheets as follows:		
Deferred income taxes - noncurrent assets	$ 9,152	$ 8,434
Deferred income taxes - noncurrent liabilities	(4,738)	(2,787)
	$ 4,414	$ 5,647

At December 31, 2018, the Company had cumulative federal and state net operating losses ("NOLs") of $289.1 million. The federal NOL carryforwards expire at various dates from 2020 through 2037. The state NOL carryforwards expire at various dates from 2018 through 2038.

The Company also has available federal, state and foreign income tax credit carryforwards of $28.7 million that expire at various dates from 2019 through 2038.

Under the provisions of the Internal Revenue Code, the net operating losses and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. Net operating losses and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership of significant shareholders over a three-year period in excess of 50%, as defined under Sections 382 and 383 of the Internal Revenue Code, as well as a similar state provision. As a result of the Edgewater Acquisition, the Company acquired approximately $34 million of net operating loss carryforwards and approximately $6 million of tax credit carryforwards. Edgewater incurred an ownership change as a result of its acquisition by the Company; however, the Company does not expect that any of the net operating losses or tax credits related to Edgewater will expire unused.

In connection with the Company's adoption of ASC 606, the Company recorded an adjustment to decrease its deferred tax assets by $2.2 million. There was no impact to the Company's consolidated financial statements for this adjustment due to the Company's full valuation allowance against these assets.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Act. The Tax Act makes broad and complex changes to the U.S. tax code, including, but not limited to: reducing the U.S. federal corporate tax rate from 35% to 21%; requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries; generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; requiring a current inclusion in U.S. federal taxable income of certain earnings (the Global Intangible Low-taxed Income ("GILTI")) of controlled foreign corporations; eliminating the corporate alternative minimum tax ("AMT") and changing how existing AMT credits can be realized; creating the base erosion anti-abuse tax ("BEAT"); creating a new limitation on deductible interest expense; changing rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017; providing a tax deduction for foreign derived intangible income ("FDII"); and changing rules related to deductibility of compensation for certain officers. The consequences of the Tax Act were reflected in the Company's U.S. tax provision for the year ended December 31, 2018 and the Company has completed its accounting for the effects of the Tax Act within the measurement period. The Company did not have any FDII or GILTI adjustments, but recorded a BEAT tax expense of $0.4 million and recorded an adjustment to the provisional amounts recorded at December 31, 2017 related to the Tax Act that decreased the Company's deferred tax assets by $0.2 million. These adjustments were recorded in the year ended December 31, 2018.

During 2018 and 2017, the Company performed an analysis to determine if, based on all available evidence, it considered it more likely than not that some portion or all of the recorded deferred tax assets will not be realized in a future period. As a result of the Company's evaluation, the Company concluded that there was insufficient positive evidence to overcome the more objective negative evidence related to its cumulative losses and other factors. Accordingly, the Company has maintained a valuation allowance against its domestic deferred tax asset amounting to $82.4 million at December 31, 2018 and $73.1 million at December 31, 2017. A similar analysis and conclusion were made with regard to the valuation allowance on the deferred tax assets of the Company's Ireland subsidiary, acquired as part of the acquisition of GENBAND, resulting in a valuation allowance of $9.5 million at December 31, 2018 and $6.2 million at December 31, 2017. In analyzing the deferred tax assets related to the Company's Canada subsidiaries, the Company concluded that it was more likely than not that the Canadian federal credits would not be realized in a future period. This resulted in a valuation allowance of $9.6 million. The deferred tax assets recognized with no valuation allowance at December 31, 2018 and 2017 relate to foreign subsidiaries where recoverability is concluded to be more likely than not based on the Company's cost plus compensation policy.

A reconciliation of the Company's unrecognized tax benefits is as follows (in thousands):

	2018	2017	2016
Unrecognized tax benefits at January 1	$ 4,528	$ 8,969	$ 8,888
Increases related to current year tax positions	74	139	36
Increases related to prior period tax positions	122	430	723
Increases related to business acquisitions	—	2,012	—
Decreases related to prior period tax positions	(1,263)	(7,022)	(81)
Settlements	—	—	(597)
Unrecognized tax benefits at December 31	$ 3,461	$ 4,528	$ 8,969

The Company recorded liabilities for potential penalties and interest of $0.1 million for the year ended December 31, 2018, $0.2 million for the year ended December 31, 2017 and $0.1 million for the year ended December 31, 2016. The Company had cumulative deferred tax liabilities recorded related to interest and penalties of $0.6 million for the year ended December 31, 2018, $0.6 million for the year ended December 31, 2017 and $0.2 million for the year ended December 31, 2016. Some of the unrecognized tax benefit items are expected to reverse in 2019 due to statute of limitation lapses.

The Company and its subsidiaries file income tax returns in the U.S. federal jurisdiction as well as various state and foreign jurisdictions. Generally, the tax years 2015 through 2018 remain open to examination by the major taxing jurisdictions to which the Company is subject. The Company's federal NOLs generated prior to 2015 could be adjusted on examination even though the year in which the loss was generated is otherwise closed by the statute of limitations.

As of December 31, 2018, the Company had ongoing income tax audits in certain foreign countries. Management believes that an adequate provision has been recorded for any adjustments that may result from tax examinations.

The Edgewater Acquisition was accounted for as a non-taxable business combination. Edgewater had previously been a single corporate filer for U.S. tax purposes. Consequently, U.S. federal and state deferred taxes were recorded as part of the business combination based on the differences between the tax basis of the acquired assets and assumed liabilities and their reported amounts for financial reporting purposes. The Company concluded that there was insufficient positive evidence to overcome the more objective negative evidence related to cumulative losses and other factors. The Company recorded identifiable intangible assets as part of the purchase accounting for the acquisition. For U.S. tax purposes, the future

amortization of these intangibles will be non-deductible, thereby creating income. Since the Company will be filing a consolidated U.S. tax return, the benefit from these identifiable intangible assets will be utilizable. The Company is required to determine its ability to use the tax benefit against the valuation allowance previously established. The Company has determined that it is more likely than not that these benefits will be recognized. As a result, the valuation allowance has been reduced for the assumed net deferred tax liabilities, resulting in an income tax benefit of $0.7 million. This benefit was included as a component of the Company's tax provision for the year ended December 31, 2018.

The 2017 acquisition of GENBAND was accounted for as a non-taxable business combination. GENBAND had previously been treated as a partnership for U.S. tax purposes. Consequently, U.S. federal and state deferred taxes were recorded as part of the business combination based on the differences between the tax basis of the acquired assets and assumed liabilities and their reported amounts for financial reporting purposes. The Company concluded that there was insufficient positive evidence to overcome the more objective negative evidence related to cumulated losses and other factors. The Company recorded a valuation allowance against the acquired deferred tax assets. The Company recorded identifiable intangible assets as part of the purchase accounting for the acquisition. For U.S. tax purposes, the future amortization of these intangibles will be non-deductible, thereby creating income. Since the Company will be filing a consolidated U.S. tax return, the benefit from these identifiable intangible assets will be utilizable. The Company is required to determine its ability to use the tax benefit against the valuation allowance previously established. The Company has determined that it is more likely than not that these benefits will be recognized. As a result, the valuation allowance has been reduced for the assumed net deferred tax liabilities, resulting in an income tax benefit of $16.4 million. This benefit was included as a component of the Company's provision for income taxes for the year ended December 31, 2017.

The 2016 acquisition of Taqua was a taxable purchase of a business under Section 197 of the Internal Revenue Code. The tax amortization related to Taqua goodwill created a deferred tax liability.

(20) MAJOR CUSTOMERS

The following customers contributed 10% or more of the Company's revenue in at least one of the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
	2018	2017	2016
Verizon Communications Inc.	17%	17%	*
AT&T Inc.	*	*	12%

At December 31, 2018, two customers accounted for 10% or more of the Company's accounts receivable balance, representing approximately 32% in the aggregate of total accounts receivable. At December 31, 2017, two customers accounted for 10% or more of the Company's accounts receivable balance, representing approximately 31% in the aggregate of total accounts receivable. The Company performs ongoing credit evaluations of its customers and generally does not require collateral on accounts receivable. The Company maintains an allowance for doubtful accounts and such losses have been within management's expectations.

(21) RELATED PARTIES

As a portion of the consideration for the Merger, on October 27, 2017, the Company issued a promissory note for $22.5 million to certain of GENBAND's equity holders who, following the Merger, owned greater than five percent of the Company's outstanding shares. As described in Note 12 above, the promissory note does not amortize and the principal thereon is payable in full on the third anniversary of its execution. Interest on the promissory note is payable quarterly in arrears and accrued at a rate of 7.5% per year for the first six months after issuance, and thereafter at a rate of 10% per year. The failure to make any payment under the promissory note when due and, with respect to payment of any interest, the continuation of such failure for a period of thirty days thereafter, constitutes an event of default under the promissory note. If an event of default occurs under the promissory note, the payees may declare the entire balance of the promissory note due and payable (including principal and accrued and unpaid interest) within five business days of the payees' notification to the Company of such acceleration. At December 31, 2018, the Promissory Note balance was $24.1 million, comprised of $22.5 million of principal, plus $1.6 million of interest converted to principal.

(22) COMMITMENTS AND CONTINGENCIES

Leases

The Company leases its facilities under operating leases, which expire at various times through 2029. The Company is responsible for certain real estate taxes, utilities and maintenance costs under these leases. The Company's corporate headquarters is located in a leased facility in Westford, Massachusetts, consisting of 97,500 square feet under a lease that expires in August 2028.

Escalation clauses, free rent and other lease concessions are recognized on a straight-line basis over the minimum lease term. Rent expense was $11.9 million for the year ended December 31, 2018, $5.9 million for the year ended December 31, 2017 and $4.5 million for the year ended December 31, 2016.

Future minimum payments under operating lease arrangements as of December 31, 2018 were as follows (in thousands):

Years ending December 31,	
2019	$ 10,705
2020	8,384
2021	7,455
2022	5,691
2023	5,430
Thereafter	19,818
	$ 57,483

Litigation and Contingencies

The Company fully cooperated with an SEC inquiry regarding the development and issuance of Sonus' first quarter 2015 revenue and earnings guidance. The Company and the SEC reached an agreement to resolve this matter and on August 7, 2018, the SEC issued a Cease and Desist Order (the "SEC Cease and Desist Order"). As part of the Order, the findings of which the Company neither admitted to nor denied, the Company agreed to pay a $1.9 million civil penalty and agreed not to violate the securities laws in the future. The Company recorded $1.9 million in the year ended December 31, 2017 for then-potential fines in connection with this investigation and has paid such amount to the SEC.

The Company is involved in six lawsuits with Metaswitch Networks Ltd., Metaswitch Networks Corp. and Metaswitch Inc. (collectively, "Metaswitch"). In five of the lawsuits, the Company is the plaintiff and, in three of those five lawsuits, the Company is also a counterclaim defendant. In the sixth case, the Company is the defendant. On January 21, 2014, GENBAND and the Company's indirectly-owned subsidiary, GENBAND US LLC, filed a complaint in the Eastern District of Texas, Marshall Division, alleging that Metaswitch infringed certain patents owned by GENBAND. Following unsuccessful mediation, a trial took place and on January 15, 2016, the jury awarded $8.2 million in past royalty damages to GENBAND, which neither GENBAND nor the Company has recorded. On September 29, 2016, the court confirmed the jury verdict following motions from both parties. On March 22, 2018, the district court entered final judgment awarding GENBAND $8.9 million in royalties for damages through January 15, 2016 at rates set by the district court, excluding pre- and post-judgment interest and costs. On April 10, 2018, the clerk of the court set the awarded costs at $0.4 million. On April 19, 2018, Metaswitch filed a notice of appeal on the judgment with United States Court of Appeals for the Federal Circuit, and filed its appeal brief on July 6, 2018. Oral argument on the appeal is set for March 8, 2019.

On April 18, 2018, through Sonus, the Company filed a complaint in the Eastern District of Texas, Marshall Division, alleging that Metaswitch is continuing to infringe the patents from the first lawsuit above through sales of Metaswitch's allegedly "redesigned" products. This suit seeks a finding that Metaswitch's infringement is willful. This suit also alleges false advertising and seeks monetary damages resulting from allegedly false and misleading statements Metaswitch made regarding the first lawsuit. The district court has set trial for September 9, 2019.

RIBBON COMMUNICATIONS INC.
Notes to Consolidated Financial Statements (Continued)

Through Sonus and GENBAND US LLC, the Company is involved as plaintiff and counterclaim defendant in a lawsuit with Metaswitch regarding claims that Metaswitch misappropriated trade secrets of GENBAND, and the Company is seeking monetary damages. This case is pending in state court in Dallas County, Texas, and stems from claims originally brought in a patent lawsuit between GENBAND and Metaswitch. The state court action was filed on March 28, 2017. Metaswitch filed its answer on April 21, 2017, in which it asserted counterclaims against GENBAND. On July 11, 2018, Metaswitch filed its fifth amended answer and counterclaims against GENBAND. The Texas state court has set a special setting for a trial for this case on April 22, 2019.

Through Sonus, the Company is also involved as plaintiff and counterclaim defendant in two patent infringement lawsuits with Metaswitch asserting the infringement of a total of ten patents that came into the Company from Sonus, and the Company is seeking monetary damages. Sonus filed these two lawsuits in the Eastern District of Texas, Marshall Division, on March 8, 2018. Metaswitch filed its answers on May 15, 2018, in which it asserted counterclaims against Sonus, including alleged infringement by the Company and Sonus of a total of ten patents. The district court has set trials for these cases to occur on February 18, 2020 and June 15, 2020.

On November 19, 2018, Metaswitch filed a complaint against the Company and several of its subsidiaries in the Southern District of New York, alleging various antitrust violations based, in large part, on allegations that GENBAND should not have brought its successful patent infringement lawsuit against Metaswitch. Metaswitch is seeking monetary damages. The Company has not yet filed an answer, and the court has not yet set a schedule.

At this time, it is not possible to predict the outcome of the litigation matters with Metaswitch, but the Company does not expect the results of any of these actions to have a material adverse effect on the Company's business or consolidated financial results.

On November 8, 2018, Ron Miller, a purported stockholder of the Company, filed a Class Action Complaint (the "Miller Complaint") in the United States District Court for the District of Massachusetts (the "Massachusetts District Court") against the Company and three of its former officers, Raymond P. Dolan, Mark T. Greenquist and Michael Swade (collectively, the "Defendants"), claiming to represent a class of purchasers of Sonus common stock during the period from January 8, 2015 through March 24, 2015 and alleging violations of the federal securities laws. Similar to a previous complaint entitled Sousa et al. vs. Sonus Networks, Inc. et al., which was dismissed with prejudice by Order dated June 6, 2017, the Miller Complaint claims that the Defendants made misleading forward-looking statements concerning Sonus' expected fiscal first quarter of 2015 financial performance, which statements were also the subject of the SEC Cease and Desist Order, whose findings the Company neither admitted nor denied. The Miller plaintiffs are seeking monetary damages.

After the Miller Complaint was filed, several parties filed and briefed motions seeking to be selected by the Massachusetts District Court to serve as a Lead Plaintiff in the action. Briefing on the issue was completed on January 30, 2019 and the Massachusetts District Court is expected to issue a decision shortly. The Company has not yet filed an answer, and the Massachusetts District Court has not yet set a schedule.

In addition, the Company is often a party to disputes and legal proceedings that it considers routine and incidental to its business. Management does not expect the results of any of these actions to have a material effect on the Company's business or consolidated financial statements.

(23) SUBSEQUENT EVENT

On February 28, 2019, the Company acquired the business and technology assets of Anova Data, Inc. ("Anova"), a provider of advanced analytics solutions, for total purchase consideration of 3.3 million shares of the Company's common stock. Anova is based in the United States and its NextGen products provide a cloud-native, streaming analytics platform for network and subscriber optimization and monetization. The Company believes that the proposed acquisition reinforces and extends Ribbon's strategy to expand into network optimization, security and data monetization via big data analytics and machine learning. The Company does not expect that the acquisition will have a material effect on its consolidated financial statements in 2019.

(24) QUARTERLY RESULTS (UNAUDITED)

The following tables present the Company's quarterly operating results for the years ended December 31, 2018 and 2017. The information for each of these quarters is unaudited and has been prepared on the same basis as the audited consolidated financial statements. In the opinion of management, all necessary adjustments, consisting only of normal recurring adjustments, have been included to present fairly the unaudited consolidated quarterly results when read in conjunction with the Company's audited consolidated financial statements and related notes.

	First Quarter	Second Quarter	Third Quarter (1)	Fourth Quarter
	(In thousands, except per share data)			
Fiscal 2018				
Revenue	$ 121,180	$ 137,361	$ 152,468	$ 166,896
Cost of revenue	65,907	62,250	70,234	71,182
Gross profit	$ 55,273	$ 75,111	$ 82,234	$ 95,714
(Loss) income from operations	$ (42,383)	$ (16,636)	$ (7,566)	$ 1,177
Net loss	$ (44,904)	$ (19,922)	$ (10,158)	$ (1,826)
Loss per share (3):				
Basic	$ (0.44)	$ (0.20)	$ (0.10)	$ (0.02)
Diluted	$ (0.44)	$ (0.20)	$ (0.10)	$ (0.02)
Shares used in computing loss per share:				
Basic	101,917	102,160	104,918	106,607
Diluted	101,917	102,160	104,918	106,607

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter (2)
	(In thousands, except per share data)			
Fiscal 2017				
Revenue	$ 53,368	$ 55,733	$ 74,629	$ 146,212
Cost of revenue	19,620	19,331	20,082	69,413
Gross profit	$ 33,748	$ 36,402	$ 54,547	$ 76,799
Loss (income) from operations	$ (10,782)	$ (12,703)	$ 3,919	$ (35,663)
Net (loss) income	$ (10,646)	$ (12,345)	$ 3,453	$ (15,714)
(Loss) earnings per share (3):				
Basic	$ (0.22)	$ (0.25)	$ 0.07	$ (0.18)
Diluted	$ (0.22)	$ (0.25)	$ 0.07	$ (0.18)
Shares used in computing (loss) diluted earnings per share:				
Basic	49,114	49,543	49,753	86,567
Diluted	49,114	49,543	50,131	86,567

(1) Includes the results of Edgewater for the period subsequent to August 3, 2018.

(2) Includes the results of GENBAND for the period subsequent to October 27, 2017.

(3) Income (loss) per share is calculated independently for each of the quarters presented; accordingly, the sum of the quarterly earnings (loss) per share amounts may not equal the total calculated for the year.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")), as of the end of the period covered by this Annual Report on Form 10-K. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2018.

Management's Annual Report on Internal Control over Financial Reporting

Our management, with the participation of our principal executive officer and principal financial officer, is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control system is designed to provide reasonable assurance to our management and Board of Directors regarding the preparation and fair presentation of published financial statements.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2018. In making its assessment of internal control over financial reporting, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control—Integrated Framework (2013)*. Based on this assessment, management concluded that, as of December 31, 2018, our internal control over financial reporting was effective.

Our evaluation excluded Edgewater, which was acquired on August 3, 2018. Our consolidated statement of operations for the year ended December 31, 2018 included gross revenue of $21.5 million and $4.3 million of net loss attributable to Edgewater. Our balance sheet as of December 31, 2018 included total assets of $24.5 million and net assets of $7.5 million attributable to Edgewater. In accordance with guidance issued by the Securities and Exchange Commission, companies are allowed to exclude acquisitions from their assessment of internal control over financial reporting during the first year subsequent to the acquisition while integrating the acquired operations.

Deloitte & Touche LLP, an independent registered public accounting firm that audited our financial statements included in this Annual Report on Form 10-K, has issued an attestation report on management's internal control over financial reporting, which is included in this Item 9A under the caption "Report of Independent Registered Public Accounting Firm."

Changes in Internal Control over Financial Reporting

As previously noted, we completed the Merger with GENBAND on October 27, 2017. During the quarter ended December 31, 2018, we completed the process of incorporating the internal controls for GENBAND into our internal control over financial reporting and extending our Section 404 compliance program under the Sarbanes-Oxley Act of 2002 and the applicable rules and regulations under such Act to include GENBAND.

Except as otherwise described above, there were no changes in our internal control over financial reporting during the fiscal quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Ribbon Communications Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Ribbon Communications Inc. and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2018, of the Company and our report dated March 4, 2019, expressed an unqualified opinion on those financial statements, and includes an explanatory paragraph relating to the adoption of Accounting Standards Codification (ASC) Topic 606, "Revenue from Contracts with Customers," on January 1, 2018.

As described in Management's Annual Report on Internal Control over Financial Reporting, management excluded from its assessment the internal control over financial reporting of Edgewater Networks, which was acquired on August 3, 2018 and whose financial statements constitute $24.5 million and $7.5 million of total and net assets, respectively, $21.5 million of revenues, and $4.3 million of net loss of the consolidated financial statement amounts as of and for the year ended December 31, 2018. Accordingly, our audit did not include the internal control over financial reporting at Edgewater Networks.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP
Boston, Massachusetts
March 4, 2019

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item 10 is included in our definitive Proxy Statement with respect to our 2019 Annual Meeting of Stockholders to be filed with the SEC not later than 120 days after the end of the fiscal year ended December 31, 2018 and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item 11 is included in our definitive Proxy Statement with respect to our 2019 Annual Meeting of Stockholders to be filed with the SEC not later than 120 days after the end of the fiscal year ended December 31, 2018 and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this Item 12 is included in our definitive Proxy Statement with respect to our 2019 Annual Meeting of Stockholders to be filed with the SEC not later than 120 days after the end of the fiscal year ended December 31, 2018 and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this Item 13 is included in our definitive Proxy Statement with respect to our 2019 Annual Meeting of Stockholders to be filed with the SEC not later than 120 days after the end of the fiscal year ended December 31, 2018 and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by this Item 14 will be included in our definitive Proxy Statement with respect to our 2019 Annual Meeting of Stockholders to be filed with the SEC and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules

1) Financial Statements

The consolidated financial statements of the Company are listed in the index under Part II, Item 8, of this Annual Report on Form 10-K.

2) Financial Statement Schedules

None. All schedules are omitted because they are not applicable, not required under the instructions or the information is contained in the consolidated financial statements, or notes thereto, included herein.

3) List of Exhibits

The Exhibits filed as part of this Annual Report on Form 10-K are listed in the Exhibit Index immediately preceding the signature page of this Annual Report, which Exhibit Index is incorporated herein by reference.

Item 16. Form 10-K Summary

None.

EXHIBIT INDEX

Exhibit No.	Description
2.1 **	Agreement and Plan of Merger, dated as of May 23, 2017, by and among the registrant, Sonus, Inc., Solstice Sapphire, Inc., Green Sapphire Investments LLC, Green Sapphire LLC, GENBAND Holdings Company, GENBAND Inc., and GENBAND II, Inc. (incorporated by reference to Exhibit 2.1 to Sonus, Inc.'s Current Report on Form 8-K, filed May 23, 2017 with the SEC).
2.2 **	Agreement and Plan of Merger, dated June 24, 2018, by and among the Registrant, Kansas Merger Sub, Inc., Edgewater Networks, Inc. and Shareholder Representative Services LLC (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q, filed August 1, 2018 with the SEC).
3.1	Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K12B, filed October 30, 2017 with the SEC).
3.2	Certificate of Amendment of the Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed November 28, 2017 with the SEC).
3.3	Amended and Restated By-Laws of the Registrant (incorporated by reference to Exhibit 3.3 to the Registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
10.1	Principal Stockholders Agreement, dated October 27, 2017, by and among the Registrant, Heritage PE (OEP) II, L.P. and Heritage PE (OEP) III, L.P. (incorporated by reference to Exhibit 99.1 to the Registrant's Current Report on Form 8-K12B, filed October 30, 2017 with the SEC).
10.2	Registration Rights Agreement, dated as of October 27, 2017, by and among the Registrant, Heritage PE (OEP) II, L.P. and Heritage PE (OEP) III, L.P. (incorporated by reference to Exhibit 99.2 to the Registrant's Current Report on Form 8-K12B, filed October 30, 2017 with the SEC).
10.3	Promissory Note, dated as of October 27, 2017 (incorporated by reference to Exhibit 99.3 to the Registrant's Current Report on Form 8-K12B, filed October 30, 2017 with the SEC).
10.4	Senior Secured Credit Facilities Credit Agreement, dated as of December 21, 2017, among the Registrant, as a Guarantor, Sonus Networks, Inc., as the Borrower, Silicon Valley Bank, as Administrative Agent, Issuing Lender, Swingline Lender and Lead Arranger, and the other lenders party thereto (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed December 26, 2017 with the SEC).
10.5	First Amendment, dated June 24, 2018, to the Credit Agreement, dated as of December 21, 2017, by and among the Registrant as a guarantor, Sonus Networks, Inc. as the Borrower, the other guarantors party thereto, Silicon Valley Bank, as Administrative Agent, Issuing Lender, Swingline Lender and Lead Arranger, and the other lenders party thereto (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed June 28, 2018 with the SEC).
10.6 +	Form of Indemnity Agreement for Officers and Directors (incorporated by reference to Exhibit 10.5 to the registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
10.7 +	Amended and Restated 2000 Employee Stock Purchase Plan, (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed October 31, 2018 with the SEC).
10.8 +	Senior Management Cash Incentive Plan, dated October 27, 2017 (incorporated by reference to Exhibit 10.7 to the Registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
10.9 +	Amended and Restated Employment Agreement between the Registrant and Raymond P. Dolan, accepted on February 23, 2015 (incorporated by reference to Exhibit 10.17 to Sonus, Inc.'s Annual Report on Form 10-K, filed February 25, 2015 with the SEC).
10.10 +	Letter Agreement, dated as of December 13, 2017, between the Registrant and Raymond P. Dolan (incorporated by reference to Exhibit 99.1 to the Registrant's Current Report on Form 8-K, filed December 14, 2017 with the SEC).
10.11	Lease, dated August 11, 2010, between Michelson Farm-Westford Technology Park IV Limited Partnership and the Registrant with respect to the property located at 4 Technology Park Drive, Westford, Massachusetts (incorporated by reference to Exhibit 10.1 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed November 2, 2010 with the SEC).
10.12	First Amendment to Lease, dated October 27, 2010, between Michelson Farm-Westford Technology Park IV Limited Partnership and the Registrant with respect to the property located at 4 Technology Park Drive, Westford, Massachusetts (incorporated by reference to Exhibit 10.2 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed November 2, 2010 with the SEC).

10.13	Second Amendment to Lease, dated as of June 16, 2017, by and between Michelson Farm-Westford Technology Park IV Limited Partnership and the Registrant with respect to the property located at 4 Technology Park Drive, Westford, Massachusetts (incorporated by reference to Exhibit 10.1 to Sonus, Inc.'s Current Report on Form 8-K, filed June 21, 2017 with the SEC).
10.14	Third Amendment to Lease between Michelson Farm-Westford Technology Park IV Limited Partnership and Sonus Networks, Inc., dated March 12, 2018 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed April 30, 2018 with the SEC).
10.15 +	2008 Stock Incentive Plan of the Registrant (incorporated by reference to Exhibit 99.1 to the Registrant's Registration Statement on Form S-8, filed October 31, 2017 with the SEC).
10.16 +	Form of Nonstatutory Stock Option Award Agreement Granted under the 2008 Stock Incentive Plan (incorporated by reference to Exhibit 10.29 to Sonus, Inc.'s Annual Report on Form 10-K, filed March 6, 2013 with the SEC).
10.17 +	2012 Amended Performance Technologies Incorporated Omnibus Incentive Plan (incorporated by reference to Exhibit 99.2 to the Registrant's Registration Statement on Form S-8, filed with the SEC effective October 31, 2017).
10.18 +	Form of Non-Qualified Stock Option Award Agreement Granted under the 2012 Amended Performance Technologies, Incorporated Omnibus Incentive Plan (incorporated by reference to Exhibit 10.7 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed April 29, 2014 with the SEC).
10.19 +	Amended and Restated Employment Agreement by and between with Jeffrey Snider, accepted May 22, 2017 (incorporated by reference to Exhibit 10.1 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed August 4, 2017 with the SEC).
10.20 +	Consulting Agreement, dated as of October 31, 2017, between the Registrant and Jeffrey M. Snider (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed October 31, 2017 with the SEC).
10.21 +	Employment Agreement between the Registrant and Kevin Riley, dated July 30, 2014 (incorporated by reference to Exhibit 10.1 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed April 29, 2016 with the SEC).
10.22 +	Employment Agreement between the Registrant and Michael Swade, accepted September 29, 2014 (incorporated by reference to Exhibit 10.2 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed April 29, 2016 with the SEC).
10.23 +*	Letter Agreement between the Registrant and Michael Swade, accepted January 13, 2019.
10.24 +	Employment Agreement between the Registrant and Susan Villare, accepted on February 3, 2012 (incorporated by reference to Exhibit 10.1 to Sonus, Inc.'s Amendment No. 1 to Current Report on Form 8-K/A, filed July 8, 2016 with the SEC).
10.25 +	Letter Agreement between the Registrant and Susan Villare, accepted on July 7, 2016 (incorporated by reference to Exhibit 10.2 to Sonus, Inc.'s Amendment No. 1 to Current Report on Form 8-K/A, filed July 8, 2016 with the SEC).
10.26 +	Amended and Restated Stock Incentive Plan of the Registrant (incorporated by reference to Exhibit 99.3 to the Registrant's Registration Statement on Form S-8, filed with the SEC on October 31, 2017).
10.27 +	Form of Nonstatutory Stock Option Award Agreement Granted under the Amended and Restated Stock Incentive Plan (incorporated by reference to Exhibit 10.2 to Sonus, Inc.'s Quarterly Report on Form 10-Q filed July 29, 2016 with the SEC).
10.28 +	Form of Restricted Stock Award Agreement Granted under the Amended and Restated Stock Incentive Plan (incorporated by reference to Exhibit 10.3 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed July 29, 2016 with the SEC).
10.29 +	Form of Restricted Stock Unit Award Agreement (Performance-Based Vesting) for Awards Granted under the Amended and Restated Stock Incentive Plan (incorporated by reference to Exhibit 10.4 to Sonus, Inc.'s Quarterly Report on Form 10-Q, filed July 29, 2016 with the SEC).
10.30 +	Form of Restricted Stock Unit Award Agreement (Time-Based Vesting) for Awards Granted under the Amended and Restated Stock Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q, filed August 1, 2018 with the SEC).
10.31 +	Employment Agreement, entered into as of April 20, 2018 between the Registrant, Sonus Networks, Inc. and Franklin W. Hobbs (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K/A, filed April 26, 2018 with the SEC).
10.32 +	Severance Agreement, entered into as of April 20, 2018, between the Registrant, Sonus Networks, Inc. and Franklin W. Hobbs (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K/A, filed April 26, 2018 with the SEC).

10.33	+	Amended and Restated Employment Agreement between the Registrant and Daryl Raiford, effective as of December 24, 2010, as amended on December 13, 2016 (incorporated by reference to Exhibit 10.30 to the Registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
10.34	+	Retention Bonus Agreement between the Registrant and Daryl Raiford, dated as of December 12, 2016 (incorporated by reference to Exhibit 10.31 to the Registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
10.35	+	Form of Letter Agreement between the Registrant and each of Franklin W. Hobbs, Daryl E. Raiford, Kevin Riley, Michael Swade and Susan Villare (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed December 17, 2018 with the SEC).
10.36	+*	Employment Agreement, dated August 12, 2013, between the Registrant and David Walsh.
10.37	+*	Amendment No. 1 to Employment Agreement, effective October 23, 2017, between the Registrant and David Walsh.
10.38	+*	Letter Agreement between the Registrant and David Walsh, accepted January 13, 2019.
10.39	+*	Independent Consultancy Agreement, effective February 2, 2019, between the Registrant and David Walsh.
10.40	+	Edgewater Networks, Inc. Amended and Restated 2002 Stock Option Plan, effective as of April 8, 2010 (incorporated by reference to Exhibit 99.1 to the Registrant's Registration Statement on Form S-8, filed August 6, 2018 with the SEC).
10.41	+	Amendment to the Edgewater Networks, Inc. Amended and Restated 2002 Stock Option Plan, dated December 7, 2016 (incorporated by reference to Exhibit 99.2 to the Registrant's Registration Statement on Form S-8, filed August 6, 2018 with the SEC).
21.1	*	Subsidiaries of the Registrant.
23.1	*	Consent of Independent Registered Public Accounting Firm, Deloitte & Touche LLP
31.1	*	Certificate of Ribbon Communications Inc. Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	*	Certificate of Ribbon Communications Inc. Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	#	Certificate of Ribbon Communications Inc. Chief Executive Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	#	Certificate of Ribbon Communications Inc. Chief Financial Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS		XBRL Instance Document
101.SCH		XBRL Taxonomy Extension Schema
101.CAL		XBRL Taxonomy Extension Calculation Linkbase
101.DEF		XBRL Taxonomy Extension Definition Linkbase
101.LAB		XBRL Taxonomy Extension Label Linkbase
101.PRE		XBRL Taxonomy Extension Presentation Linkbase

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* Filed herewith.

\# Furnished herewith.

\+ Management contract or compensatory plan or arrangement filed in response to Item 15(a)(3) of the Instructions to the Annual Report on Form 10-K.

** Certain schedules and exhibits have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Registrant hereby undertakes to furnish copies of any of the omitted schedules and exhibits upon request by the U.S. Securities and Exchange Commission.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

RIBBON COMMUNICATIONS INC.

By: /s/ Daryl E. Raiford

March 5, 2019

Daryl E. Raiford
Executive Vice President and Chief Financial Officer

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Important Information Regarding Forward-Looking Statements

This Annual Report and Proxy Statement contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which are subject to a number of risks and uncertainties. All statements other than statements of historical fact contained in this Annual Report and Proxy Statement are forward-looking statements. Without limiting the foregoing, the words “anticipates”, “believes”, “could”, “estimates”, “expects”, “intends”, “may”, “plans”, “seeks”, “projects”, “will” and other similar language, whether in the negative or affirmative, are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. The forward-looking statements in this Annual Report and Proxy Statement include statements regarding management's goals, plans, and intentions, driving shareholder value, investments in and opportunities for our business, product offerings and our position in the market, and are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Although we believe that our current expectations and assumptions are reasonable, readers are cautioned that these forward-looking statements are only predictions and are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict, and our actual results may differ materially from those contemplated by the forward-looking statements as a result of various factors, including those discussed in the “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Risk Factors” sections of the copy of our Form 10-K included as part of this Annual Report. Any forward-looking statement represents our views only as of the date such statement was made and should not be relied upon as representing our views as of any subsequent date. While we may elect to update forward-looking statements in the future, we specifically disclaim any obligation to do so.

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