ANNUAL REPORT

A10 NETWORKS 2019

A10

To Our Stockholders,

The world is more connected than ever before. Our mission to provide secure, scalable connectivity continues to gain relevance at both personal and business levels.

Our customers are most concerned with driving growth and revenue for their businesses; ensuring the best customer (and employee) experiences; and enhancing operational efficiencies. These challenges drive our mission: to enable service providers and enterprises to deliver business-critical applications that are secure, available and efficient for multi-cloud transformation and 5G readiness.

It is my goal to carry this mission forward and I am excited about our future. We have a unique opportunity to positively impact our customers' ability to achieve better business outcomes, especially during challenging world events. With a trusted customer base of over 7,000 customers, we consider it a responsibility to help them navigate the changing world in the most effective way.

I believe we are entering a new phase for A10, one in which we will hone our strategic focus, build a culture of operational excellence and balance growth and profitability.

There is no doubt, the last few years have had their challenges. I acknowledge there are areas where our results have not been satisfactory. We have not hit our commitments; we have not achieved the expected organic growth; and we have operated at a loss.

My commitment is to turn these challenges into opportunities, focusing the entire company on our strategic initiatives, regularly communicating where we are against our plan and energizing our workforce to achieve our goals. These goals fall into three key areas:

Focus strategic capital allocation to address dynamic market trends and customer needs – A10 listens to its customers. There are many examples where we have heard the challenges customers were facing. These included spikes in DDoS attacks, the operational challenges of moving to multi-cloud and containerized infrastructures, and securing multi-generational mobile networks. And we have responded. Our strategic focus must always be on solving the challenges that the majority of our customers are facing and will face in the future with products and services that deliver the performance and scale required for next-generation networks.

Drive a culture of operational excellence – In the last two years, we made commitments that we did not achieve. We could point to market or operational challenges but at the end of the day, we must be held accountable to our business plan. Going forward, we are driving a culture of accountability: to our business plan, revenue targets, and product development milestones. Each employee will understand how they contribute to our operational targets and the outcomes that are expected of them.

Balance growth and profitability – Much like operational excellence, we must have a balance of growth and profitability: strategically grow our revenue and business while maintaining profitability. One without the other will not drive the success that all of our stakeholders require from us. Our business plan, culture, operations and product roadmap will be developed with this goal in mind.

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Ultimately, we provide the products and solutions that help people to be more connected in a secure way. We are facing unprecedented macro uncertainty and global change. However, we remain committed to our vision of empowering our customers to provide a secure and reliable digital experience.

Thank you for your continued support.

Dhrupad Trivedi

President and CEO
A10 Networks

Forward-Looking Statements

We have included in this letter "forward-looking statements," within the meaning of Section 27A of the Securities Act of 1933. These forward-looking statements may be identified by terms such as anticipate, believe, foresee, expect, remain, may, will, provide, could and should and the negative of these terms or other similar expressions. These forward-looking statements include, but are not limited to, statements regarding industry challenges and trends, our company vision, positioning, strategy, growth and profitability, culture and accountability.

Forward-looking statements are subject to known and unknown risks and uncertainties and are based on assumptions that may prove to be incorrect, which could cause actual results to differ materially from those expected or implied by the forward-looking statements. Factors that may cause actual results to differ include the impact of the COVID-19 pandemic and other risks discussed in "Risk Factors" in our filings with the Securities and Exchange Commission, including our annual report on Form 10-K and quarterly reports on Form 10-Q. We expressly disclaim any obligation to update or alter our forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law.

A10

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

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019

OR

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

For the transition period from ________ to ________

Commission file number: 001-36343

A10 NETWORKS, INC.
(Exact Name of Registrant as Specified in its Charter)

Delaware	**20-1446869**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**

2300 Orchard Parkway, San Jose, California 95131

(Address of Principal Executive Offices and Zip Code)

(408) 325-8668

(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, $.00001 Par Value	**New York Stock Exchange**

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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of ''large accelerated filer,'' ''accelerated filer,'' ''smaller reporting company,'' and ''emerging growth company'' in Rule 12b-2 of the Exchange Act.

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 registrant's common stock held by non-affiliates of the registrant as of June 28, 2019 (the last business day of the registrant's most recently completed second fiscal quarter) was approximately $284.1 million, based upon the closing sale price of such stock on the New York Stock Exchange. For purposes of this disclosure, shares of common stock held or controlled by executive officers and directors of the registrant and by persons who hold more than 5% of the outstanding shares of common stock have been treated as shares held by affiliates. However, such treatment should not be construed as an admission that any such person is an ''affiliate'' of the registrant. The registrant has no non-voting common equity.

As of February 28, 2020, the number of outstanding shares of the registrant's common stock, par value $0.00001 per share, was 78,274,943.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the 2020 Annual Stockholders' Meeting, which the registrant expects to file with the Securities and Exchange Commission within 120 days of December 31, 2019, are incorporated by reference into Part III (Items 10, 11,12, 13 and 14) of this Annual Report on Form 10-K.

A10 NETWORKS, INC.
ANNUAL REPORT ON FORM 10-K
FOR THE YEAR ENDED DECEMBER 31, 2019
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FORWARD – LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements made pursuant to the provisions of Section 21E of the Securities Exchange Act of 1934. These forward-looking statements are based on management's current expectations and beliefs, including estimates and projections about our industry. The following discussion and analysis contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The words "believe," "may," "will," "potentially," "estimate," "continue," "anticipate," "intend," "could," "would," "project," "plan," "expect," and similar expressions that convey uncertainty of future events or outcomes are intended to identify forward-looking statements.

These forward-looking statements include, but are not limited to, statements concerning the following:

- *our ability to provide customers with improved benefits relating to their applications;*
- *our ability to maintain an adequate rate of revenue growth and other factors contributing to such growth;*
- *our ability to successfully anticipate market needs and opportunities;*
- *our business plan and our ability to effectively manage our growth;*
- *our plans to expand our sales efforts;*
- *our plans to introduce new products;*
- *loss or delay of expected purchases by our largest end-customers;*
- *our ability to further penetrate our existing customer base;*
- *our ability to displace existing products in established markets;*
- *continued growth in markets relating to network security;*
- *our ability to timely and effectively scale and adapt our existing technology;*
- *our ability to innovate new products and bring them to market in a timely manner;*
- *our ability to expand internationally and any related impact on profitability;*
- *the effects of increased competition in our market and our ability to compete effectively;*
- *the effects of seasonal trends on our results of operations;*
- *our expectations concerning relationships with third parties;*
- *the attraction, retention and growth of qualified employees and key personnel;*
- *our ability to achieve or maintain profitability while continuing to invest in our sales, marketing and research and development teams;*
- *our expectations regarding our future expenses;*
- *our exploration of strategic alternatives;*
- *variations in product mix or geographic locations of our sales;*
- *fluctuations in currency exchange rates;*
- *tariffs affecting us;*
- *increased cost requirements of being a public company and future sales of substantial amounts of our common stock in the public markets;*
- *the cost and potential outcomes of litigation;*
- *our ability to maintain, protect, and enhance our brand and intellectual property;*
- *future acquisitions of or investments in complementary companies, products, services or technologies;*
- *our ability to effectively integrate operations of entities we have acquired or may acquire; and*
- *actions relating to the remediation of identified material weaknesses.*

These forward-looking statements are subject to a number of risks, uncertainties, and assumptions, including those described in Item 1A Risk Factors and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment, and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties, and assumptions, the forward-looking events and circumstances discussed in this Annual Report on Form 10-K may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Annual Report on Form 10-K to conform these statements to actual results or to changes in our expectations, except as required by law.

Our investor relations website is located at https://investors.a10networks.com. We use our investor relations website, our company blog (https://www.a10networks.com/blog) and our corporate Twitter account (https://twitter.com/A10Networks) to post important information for investors, including news releases, analyst presentations, and supplemental financial information, and as a means of disclosing material non-public information and for complying with our disclosure obligations under Regulation FD. Accordingly, investors should monitor our investor relations website, our company blog and our corporate Twitter account, in addition to following press releases, SEC filings and public conference calls and webcasts. We also make available, free of charge, on our investor relations website under "SEC Filings," our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to these reports as soon as reasonably practicable after electronically filing or furnishing those reports to the SEC.

PART I

Item 1. Business

Overview

We are a leading provider of secure application solutions and services that enable a new generation of intelligently connected companies with the ability to continuously improve cyber protection and digital responsiveness across dynamic Information Technology (''IT'') and network infrastructures. Our portfolio of software and hardware solutions combines industry-leading performance and scale with advanced intelligent automation, machine learning, data driven analytics, and threat intelligence to ensure security and availability of customer applications across their multi-cloud and mobile infrastructure networks, including on-premise, private and public clouds. As the cyber threat landscape intensifies and network architectures evolve, we are committed to providing customers with greater connected intelligence to improve the security, visibility, automation, availability, flexibility, management and performance of their applications. Our customers include leading cloud providers, web-scale businesses, service providers, government organizations, and enterprises.

Industry Trends & Market Drivers

The digitization of business has made applications a critical ingredient in virtually every aspect of operations. How safely and efficiently applications perform determines how businesses perform, how they compete, grow, and stand out in the marketplace. The application networking and security industry is experiencing dynamic shifts in the way applications are developed, delivered, monetized and protected. Our corporate strategy and technology address these evolving needs of our customers and industry, including:

Increased Adoption of Cloud Applications. For decades, businesses operated with applications based in physical, appliance-based data centers. While these traditional applications remain central to businesses around the world, a new genre of cloud-based applications is emerging, presenting new opportunities and challenges that require organizations to reassess the visibility, performance and security of their applications. Some of these challenges relate to how a business effectively manages secure application services across various data centers and cloud types - whether private, public or hybrid clouds. Over time, more and more applications may be born in the cloud, while some applications that existed in traditional data centers may migrate to clouds as well. To address this shift, businesses will need solutions that bridge both traditional and cloud-based application environments and centrally manage all secure application services holistically in this multi-cloud world.

Increased Network Complexity and New Infrastructure Paradigms. Traditional IT vendors may need to shift from hardware-centric models to software-defined approaches to improve agility for critical applications, and subsequently, their business operations. Ensuring product portfolios adapt and diversify to include newer virtualized software, container based software and cloud-based offerings are key factors determining future market leadership and competitive landscapes.

Growing Importance of Automation and Orchestration. As applications increasingly move to a multi-cloud environment, the deployment of orchestration and automation tools has become essential to efficiently automating the deployment and operations of security and application services. There is a need for increased operational efficiency and agility, improved detection and reporting of security anomalies, enhanced end-user experiences and reduced total cost of ownership (''TCO''), simplified management of distributed application services, improved capacity planning and optimized multi-cloud software lifecycle management. By deploying newly developed secure application delivery automation and predictive analytics tools, enterprises are able to visualize their application performance, detect anomalous trends and fully automate their application delivery and network security.

The Rise of DDoS Attacks. The cyber threat landscape continues to intensify and grow. Malicious actors and cybercriminals such as hacktivists, amateur hackers, and foreign military and intelligence organizations target data centers of every type. Distributed Denial of Service (''DDoS'') attacks are increasing in size, frequency, complexity and notoriety. IT defenders are faced with the increasing sophistication of adversaries who are responsible for the size and frequency of these attacks.

A DDoS attack seeks to render a target network or website unavailable by orchestrating coordinated attacks from massive worldwide networks of compromised endpoints, called botnets. Compromised endpoints can be computing devices or ''Internet of Things'' driven devices like video cameras. Any internet-connected device can be vulnerable to hackers and utilized as part of a botnet.

Rapid growth of TLS, SSL, Encrypted Applications and Hidden Threats. Many applications use Transport Layer Security (''TLS'') and Secure Sockets Layer (''SSL'') protocols. Cyber criminals exploit the protocol to hide malicious malware within encrypted channels and carry out attacks against businesses and users. This malicious trend drives demand for greater visibility within SSL-encrypted channels. Businesses need a way to decrypt traffic and apply outbound security policies efficiently, and require an effective way to inspect, identify, and remediate malicious traffic, then re-encrypt traffic and deliver it quickly to its destination. Conducting this process efficiently without placing a ''security performance tax'' on the user experience is a critical requirement.

The Advent of 5G Networks and a Smart World. The growing deployment of commercial 5G networks will bring massive increases in network throughput and significant new business opportunities for mobile carriers. It will also require a new generation of security infrastructure capable of handling the growing capacity requirements and complex management needs of 5G networks. Capacity requirements increase dramatically in 5G networks due to substantial increases in concurrent sessions, lower packet size and higher connections per second. Operators must dramatically lower latency, reduce total cost of ownership, and improve efficiency which may require advanced consolidation of network functions at the core. Meanwhile, the scope and size of DDoS attacks may also increase dramatically with the proliferation of connected devices and traffic, due in large part to the expansion of Internet of Things (''IoT'')/Machine-to-Machine traffic coming from new 5G-delivered Smart World applications. To address these requirements, mobile operators will need new solutions that provide hyperscale and increased performance, richer feature sets, and rich automation, analytics and threat intelligence.

Need for Advanced Multi-Cloud Secure Application Service Solutions. To address these challenges, advanced and integrated solutions for managing secure application services across businesses' application environments are needed. Of the many solution requirements, some of the more critical include:

- ***Ability to Centrally Manage Traditional and Cloud Environments.*** As more applications are born in the cloud, and they operate alongside traditional applications supported by on-premise and appliance-based data centers, application delivery and security solutions will be called upon to span traditional and cloud-based environments. In doing so, solutions must centrally control and manage secure application services across any combination of traditional data centers and a myriad of different clouds. To support data centers and different cloud types, solutions require a variety of form factors: hardware, software (i.e. virtual, bare metal and containers) and cloud-based offerings.

- ***Clear Visibility and Sophisticated Analytics.*** The effectiveness of application performance and security depends greatly on the level of visibility a business has into its application traffic. That visibility must be able to span any number of data centers and cloud types to ensure a holistic view of security threats and performance issues affecting applications. The deeper and clearer the visibility, the better the analytics and actionable information that can be applied to enhancing application performance and protection. Secure application service solutions must be driven by solid visibility and per-app analytics.

- ***Ability to Scale.*** Performance and security at scale are paramount in today's dynamic application environments. Solutions need to analyze application traffic quickly and enhance performance and security in traditional and cloud-based application environments in a centrally managed manner. With the rapid adoption of IoT devices, and the advent of 5G, we believe scale will become imperative.

- ***Sophisticated Security Functionality.*** Secure application service solutions must detect and mitigate sophisticated cybersecurity threats, such as malicious threats hiding in encrypted traffic and DDoS attacks. To defend against the rising volume of sophisticated cyber-attacks, solutions require exceptional performance and scale without dramatically increasing footprint and total cost of ownership.

Product Portfolio

Our product portfolio seeks to address many of the aforementioned challenges and solution requirements. The portfolio consists of six secure application solutions and two intelligent management and automation tools.

Our software solutions are available to be delivered in a variety of form factors, such as embedded in optimized hardware appliances, as bare metal software, containerized software, virtual appliances and cloud-native software. While our revenue to date has predominantly derived from delivery of our proprietary software on a perpetual license basis embedded in optimized hardware, this model has begun to evolve in various ways, including among others,

term licenses, subscriptions, and software-only models. Our comprehensive and flexible application solutions portfolio, combined with our Harmony Controller positions us to address the growing need for shifting workloads to a mix of private clouds and public clouds. A10 Harmony Controller is built on microservices and container technologies and offers a multi-tenant, highly scalable controller architecture that incorporates real-time and predictive analytics at a per-app level and central management and orchestration of secure application services across hybrid environments - from physical data centers to public, private and hybrid clouds.

The following is an overview of our portfolio:

Secure application solutions:

1. Thunder Application Delivery Controller (“ADC”)
2. Lightning Application Delivery Controller (“Lightning ADC”)
3. Thunder Carrier Grade Networking (“CGN”)
4. Thunder Threat Protection System (“TPS”)
5. Thunder SSL Insight (“SSLi”)
6. Thunder Convergent Firewall (“CFW”)

Intelligent management and automation tools:

1. Harmony Controller
2. aGalaxy TPS

The following is a further overview of our portfolio:

Secure Application Solutions

1. *Thunder Application Delivery Controller*. Thunder ADC provides advanced server load balancing, including global server load balancing, high availability, aFleX scripting, aVCS, ADP multi-tenancy, SSL, offload, acceleration, caching and compression, web application firewall (“WAF”), domain name server (“DNS”) application firewall (“DAF”) and others. ADCs are typically deployed in front of a server farm within a data center, including web, application and database servers.
2. *Lightning Application Delivery Controller*. Lightning ADC services ADC functionality in the cloud, increasing the agility and reducing costs for customers. Introduced after the acquisition of Appcito, Inc. (“Appcito”) in 2016, Lightning ADC is a cloud-native software-as-a-service (“SaaS”) platform designed to boost the delivery and security of applications and microservices across public, private and hybrid clouds, enabling ADC-as-a-service. Central to the Lightning ADC is the SaaS-based A10 Harmony Controller, which provides central management, policy configuration, and a big data repository and analytics engine.
3. *Thunder Carrier Grade Networking*. Thunder CGN extends the life of increasingly scarce IPv4 address blocks and their associated infrastructure using Carrier-Grade network address translation (“CGNAT”), and also provides translation solutions to the IPv6 addressing standard. Our CGN solution is typically deployed in service provider networks to provide standards-compliant address and protocol translation services between varying types of IP addresses, and has been successfully implemented by many large service providers around the world.
4. *Thunder Threat Protection System*. Thunder TPS solution provides high-volume, large-scale protection for customers’ networks and server resources against massive DDoS attacks. TPS is typically deployed at the perimeter of the networks to protect internal network resources from large-scale, volumetric and multi-vector attacks. In 2017, we enhanced the TPS solution with the launch of a dedicated detector function, improved workflow and automation in aGalaxy TPS. In 2018, we enhanced our TPS detection capabilities with the One-DDoS solution, which enables Thunder ADC, CGN, and CFW solutions to act as in-line detectors to enhance application and infrastructure detection. We also added TPS Dynamic Attack Pattern Recognition (DAPR) for automatic attack learning, to identify and thwart zero-day attacks, and

enhanced machine learning (ML) with always-on adaptive learning. TPS is augmented by the A10 Threat Intelligence Service which can block known bad connections (i.e., IP addresses) from entering protected networks. This service is based on software licensed from ThreatSTOP, Inc. and A10 threat research.

5. *Thunder SSL Insight.* Thunder SSLi eliminates the inherent blind spots created by SSL encryption by offloading CPU-intensive SSL decryption functions that enable security devices to inspect and remove malware within encrypted traffic. Thunder SSLi decrypts SSL-encrypted traffic and forwards it to a third-party security device, such as a firewall, for deep packet inspection (''DPI''). Once the traffic has been analyzed and scrubbed, Thunder SSLi re-encrypts the traffic and forwards it to its intended destination.

6. *Thunder Convergent Firewall.* Thunder CFW addresses multiple critical security capabilities in one package by consolidating multiple security and networking functions in a single appliance, helping customers significantly lower capital and operating expenses. Its performance and scale delivers superior value to customers, all within a small form factor, and streamlines customer operations with a cloud-ready programmable platform.

   Thunder CFW includes:

   - A high-performance Secure Web Gateway with integrated explicit proxy, URL filtering and SSL visibility, enabling security policy enforcement for outbound HTTP/HTTPS client traffic. Our solution includes an Office 365 proxy to provide scalability, performance, and security to overcome deployment and operational challenges.
   - A high-performance data center firewall with integrated network denial-of-service protection and server load balancing, and provides a Layer 4 stateful firewall and Layer 7 application-level gateway functionality for protecting data center applications from emerging network and DDoS threats.
   - A high-performance Gi/SGi firewall with integrated network DDoS, CGNAT, ADC and application visibility. The Gi/SGi firewall protects the mobile operator infrastructures from Internet-based DDoS and other security threats.
   - A high-performance IPsec VPN, a security product designed to strengthen security postures and protect application data.

Intelligent Management and Automation Tools

1. *Harmony Controller.* Harmony Controller provides intelligent management, automation and analytics for secure application delivery in multi-cloud environments. Our Harmony Controller simplifies operations. Infrastructure and application operations teams can centrally manage and automate configuration and application policies for our Thunder and Lightning application and security services, such as load balancing, application delivery, web application firewall, SSL decryption, Gi/SGi firewall, Carrier Grade NAT and Office 365 solutions. Configuration and control can also be automated via application program interface (''API'') and integrated with orchestration systems used within organizations. In addition, the controller provides comprehensive infrastructure and per-application metrics and analytics for performance and security monitoring, anomaly detection and faster troubleshooting. The container-based, microservices architecture allows controller capacity to be scaled without interrupting operations. Our Harmony Controller is available in two deployment models: A10 managed software as a service (''SaaS''), or as a self-managed, on premise deployment.

2. *aGalaxy TPS. a*Galaxy TPS multi-device network management solution enables a network administrator to manage multiple Thunder TPS devices. aGalaxy TPS is designed to provide lower operational costs, as staff are freed up from repetitive tasks, while also increasing precision and accuracy with centralized and automated tasks, reducing the potential for human error. aGalaxy TPS is available as a hardware appliance or a software-only virtual machine. aGalaxy TPS highlights included advanced workflow and automated defense capabilities.

Product Form Factors

Our products are offered in a variety of form factors and payment models, including physical appliances and perpetual and subscription based software licenses, as well as pay-as-you-go licensing models and FlexPool, a flexible consumption-based software model. FlexPool allows businesses to flexibly allocate and re-distribute capacity across applications, multiple clouds and data centers.

Thunder Series. ADC, CGN, TPS, SSLi, and CFW products are available on the Thunder Series family of physical appliances. The Thunder Series products support throughput ranges from 200 Mbps to 300 Gbps. The appliance family provides a variety of other security and performance options.

vThunder virtual appliances operate on all major hypervisor platforms, including VMware, Microsoft Hyper-V and Linux KVM. vThunder is also available from cloud providers like Amazon Web Services (''AWS''), Microsoft Azure, and service providers. The vThunder Series products support throughput ranges from 200 Mbps to 100 Gbps.

Thunder for Bare Metal is a software version of our ADC and CGN solutions that is designed to run on a variety of Intel x86 servers, allowing the customer to design and select their own hardware platform.

Lightning is a cloud-native SaaS ADC product designed to boost the delivery and security of applications and microservices across public, private and hybrid clouds. Our Lightning ADC and the A10 Harmony Controller's multi-cloud management capabilities allow flexible application deployment across multiple clouds with the ability to maintain and manage diverse workloads. Our Lightning ADC will run natively on public cloud environments, such as Amazon Web Services, Microsoft Azure, and Google Cloud Platforms.

AX Series: Our ADC and CGN solutions are available on select older models from the AX Series line.

Underlying Technology

Since our inception, our solutions have been known for their high performance and scalability in some of the largest and most demanding networks. The value and significance of our high-performance offerings reside in our portfolio's underlying software operating system. With the exception of Lightning ADC, our products are built on the Advanced Core Operating System (''ACOS'') platform and leverage its performance optimization and security features.

The ACOS platform is optimized for modern 64-bit central processing units (''CPUs''), which increasingly have multiple parallel processing cores that operate within a single CPU for higher efficiency and performance scalability. To maximize the capabilities of these increasingly dense multi-core CPUs, ACOS implements a proprietary shared memory architecture that provides all cores with simultaneous access to common memory. This shared memory software architecture enables our products to utilize these multi-core CPUs efficiently and scale performance with increasing CPU cores. As a result, ACOS provides customers with products that can deliver superior price performance benefits over products that lack these capabilities.

ACOS' high-performance design enables our products to address a wide range of performance-driven networking challenges. The flexible software design of ACOS allows us to apply our portfolio to a variety of markets for a variety of needs. Some notable details about ACOS include:

High Performance and Intelligent Network Input/Output (''I/O'') Processing. In order to maximize the efficiency of high density, multi-core processors, we have developed a high performance intelligent network I/O technology that can balance application traffic flows equitably across processor cores. Our Flexible Traffic Accelerator logic can be implemented either as software running within a standard x86 processor or a Field Programmable Gate Array (''FPGA'') semiconductor. Our Flexible Traffic Accelerator (''FTA'') also performs certain hardware-based security checks for each packet and can discard suspicious traffic before it can impact system performance.

Scalable and Efficient Memory Usage. To improve the performance of the multi-core processor architecture, we have developed a shared memory technology to allow all processors to share common memory and the state of the system simultaneously. This avoids the overhead associated with Inter-Processor Communication architectures deployed in first-generation approaches. We optimize memory to be visible to all cores simultaneously, while minimizing communication overhead and contention among processors for allocated memory space. All processors share a common memory pool, which dynamically allocates memory space based on application processing requirements without constraints. Customers can achieve greater performance and scalability from memory and processor resources because configurations, policies and network databases are efficiently stored within a shared memory architecture.

Optimized Application Networking and Security. Once data is processed and placed into a shared memory, a processor can begin to apply ACOS common services and function-specific logic. To ensure that every processor is utilized to perform every function and thereby achieve greater system utilization, ACOS uses all processor cores symmetrically for all functions and services. The ACOS common services perform a set of key operational

functions, including configuration management, network I/O, aFleX scripting, Virtual Chassis System (“aVCS”), aXAPI for management integration, Application Delivery Partitions (“ADPs”), virtualization to enable multi-tenancy, and common resource management such as buffer, system memory, timer management and other internal system management tasks. ACOS features a modular software design, which improves reliability by ensuring that modifications made to one module will not have unwanted side effects on other system functions.

Other noteworthy ACOS Technologies. ACOS incorporates a number of other technologies to provide a rich environment for developing Layer 4-7 application networking solutions, including:

- ***aFleX Scripting.*** aFleX scripting technology is based on industry-standard tool command language and enables customers to write custom scripts to augment the application processing.
- ***ADP.*** ADP enables multi-tenancy in the ACOS common services so that multiple departments of an organization or multiple customers can share a physical/virtual appliance.
- ***aVCS.*** aVCS enables multiple physical/virtual appliances to be managed as a single chassis.
- ***aXAPI.*** aXAPI is an industry standard representational state transfer (“RESTful”) program interface to enable management integration for automated management.

Support & Services

One of our founding principles is to provide excellent customer support. Our global support team is part of our engineering organization and is trained across all products and solutions, and takes complete ownership of customer issues from the beginning to the end to achieve rapid response and resolution. Our consistent, high-quality customer service and technical support is a key factor in attracting and retaining customers of all sizes, as well as support services that include installation, phone support, repair and replacement, software updates, online tools, consulting and training services.

All customers receive standard warranty support for 90 days with the purchase of our products. We offer four maintenance options - Basic, Basic Plus, Gold and Platinum support programs (Platinum available in select countries). Maintenance contracts may be purchased in 12-month increments up to five years. The average maintenance contract term is approximately 18 months. We invoice channel partners or customers directly for maintenance contracts at the time of hardware purchase, and all maintenance contracts are non-cancellable and are generally renewed through the same channel as originally purchased. Software updates are provided to all customers with a current maintenance contract on a when-and-if-available basis. We maintain technical support centers in the United States, Japan, China, India and the Netherlands.

Thunder TPS features an enhanced support offering that includes access to the A10 DDoS Security Incident Response Team (“SIRT”). Augmenting the standard support, the offering includes access to a dedicated team of DDoS mitigation experts specializing in DDoS prevention, offering immediate assistance for mitigating attacks, and a subscription to the A10 Threat Intelligence Service, leveraging collective intelligence to block known threats.

Our professional services team provides a full range of fee-based consulting services, including pre-sale network assessment, comprehensive network analysis and capacity planning, post-sale migration and implementation services, on-site installation and ongoing support.

Customers

Our customers operate in a variety of industries, including telecommunications, technology, industrial, government, retail, financial, gaming, and education. As of December 31, 2019, we had sold our products to more than 6,020 end customers across 133 countries. Our customers include the top two United States wireless carriers, four of the top 10 United States cable providers, and the top four service providers in Japan, in addition to other global enterprises, gaming companies and governmental organizations. During the years ended December 31, 2019, 2018 and 2017, purchases from our 10 largest end-customers accounted for approximately 36%, 37% and 35% of our total revenue, respectively.

In 2019, two distribution channel partners, Arrow Electronics, Inc. and ITOCHU Techno-Solutions Corporation, accounted for 14% and 12% of our total revenue, respectively. In 2018, two distribution channel partners, Adaptive Integration and ITOCHU Techno-Solutions Corporation, accounted for 14% and 10% of our total revenue, respectively. In 2017, no customer accounted for more than 10% of our total revenue.

In 2019, we changed the way we present revenue by customer vertical. We now report two customer verticals: service providers and enterprises, compared to service providers, enterprises and web giants in prior years. Our previously reported revenue from web giants is primarily accounted for now in enterprise revenue. The revenue by vertical percentages from prior years included in this report have been revised to conform with current year presentation. Additionally, we changed the way we present customer revenue by geographic region. We now report customer revenues in four geographic regions: the Americas, Japan, Asia Pacific (excluding Japan) and EMEA. Our previously reported customer revenues of our United States and Latin America regions are now included in the Americas geographic region. We believe this new geographic and vertical view aligns with how we manage the business and maps our product portfolio to customer segments.

Competition

As security, 5G and multi-cloud trends continue to gain prominence, changes in application delivery needs, cyber security threats, and the technology landscape result in evolving customer requirements to address application scalability, performance, security and intelligent automation. These evolving demands have expanded our addressable market into DDoS protection, 5G network security (Gi-LAN protection) and multiple areas of cloud and network security, where we compete with a number of companies not included among traditional ADC vendors. The agility and flexibility of the ACOS platform enables us to rapidly innovate and deploy solutions into adjacent markets to ADC. We have also enhanced our portfolio with the Harmony Controller, an intelligent management, automation, and predictive analytics platform for secure application delivery in multi-cloud environments and advanced protection of the 4G/5G mobile infrastructure services. This container and microservices-based product complements our comprehensive set of hardware, software and cloud offerings.

We do not consider any of these markets to include a single dominant company, nor do we consider the markets to be fragmented. Our main competitors fall into the following categories:

- Companies that sell products in the traditional ADC market, such as F5 Networks, Inc. (‘‘F5 Networks’’) and Citrix Systems, Inc. (‘‘Citrix Systems’’);
- Companies that sell open source, software-only, cloud-based ADC services, such as Avi Networks Inc. (‘‘Avi Networks’’), NGINX Inc. (‘‘NGiNX’’), and HAProxy Technologies, Inc. (‘‘HAProxy’’) as well as many startups;
- Companies that sell Gi/SGi firewall and CGN products, which were originally designed for other networking purposes, such as edge routers and security appliances from vendors like Cisco Systems, Inc. (‘‘Cisco Systems’’), Juniper Networks, Inc. (‘‘Juniper Networks’’) and Fortinet, Inc. (‘‘Fortinet’’);
- Companies that sell traditional DDoS protection products, such as Arbor Networks, Inc., a subsidiary of NetScout Systems, (‘‘Arbor Networks’’) and Radware, Ltd. (‘‘Radware’’);
- Companies that sell SSL decryption and inspection products, such as Symantec Corporation (through its acquisition of Blue Coat Systems Inc. in 2016) and F5 Networks; and
- Companies that sell certain network security products, including Secure Web Gateways, SSL Insight/SSL Intercept, data center firewalls and Office 365 proxy solutions.

The key competitive factors in our markets include:

- Ability to innovate and respond to customer needs rapidly;
- Ability to address on-premise and cloud application environments in a secure, centrally managed manner;
- Ability to accommodate any IT delivery model or combination of models, regardless of form factor;
- Breadth and depth of product features and functionality;
- Level of customer satisfaction;
- Price, performance, and efficiency;
- Ability for products to scale with high-speed network traffic;
- Flexible and agile design of products;
- Ability to detect and mitigate large-scale cyber security threats;

- Brand awareness and reputation;
- Strength of sales and marketing; and
- Ability to attract and retain talented employees.

Sales and Marketing

Sales

Our high-touch sales force engages customers directly and through distribution channels. Our sales team is comprised of inside sales and field sales personnel who are organized by geography and maintain sales presence in 28 countries as of December 31, 2019, including in the following countries and regions: United States, Western Europe, the Middle East, Japan, China, Taiwan, South Korea, Southeast Asia and Latin America. Our sales organization includes sales engineers with deep technical domain expertise who are responsible for pre-sales technical support, solutions engineering, proof-of-concept work and technical training for our distribution channel partners. Our sales team is also comprised of a channel sales organization that is expanding our market reach through partners. We may continue to grow our sales headcount, including in geographies where we currently do not have a sales presence.

Some customer sales are originated and completed by our Original Equipment Manufacturer (''OEM'') and distribution channel partners with little or no direct engagement with our sales personnel. We fulfill nearly all orders globally through our distribution channel partners, which include distributors, value added resellers and system integrators. Revenue fulfilled through our distribution channel partners accounted for 90%, 93% and 86% of our total revenue for the years ended December 31, 2019, 2018 and 2017, respectively.

Marketing

Our strategy is focused on driving greater demand for our products and services, and enabling sales to win as that demand broadens. Our marketing drives global demand generation campaigns, as well as additional awareness and demand via joint marketing campaigns with channel partners and strategic alliance partners worldwide. Our marketing also drives global awareness through industry analyst engagement, financial analyst engagement, media outreach, blogs, social media and events.

Manufacturing

We outsource the manufacturing of our hardware products to original design manufacturers. This approach allows us to benefit from the scale and experience of our manufacturing partners to reduce our costs, overhead and inventory while allowing us to adjust more quickly to changing customer demand. Our manufacturers are Lanner Electronics Inc. (''Lanner''), AEWIN Technologies Co., Ltd. (''AEWIN'') and iBase. These companies manufacture and assemble our hardware products using design specifications, quality assurance programs and standards established by us. Our manufacturers procure components and assemble our products based on our demand forecasts and purchase orders. These forecasts represent our estimates of future demand for our products based on historical trends and analysis from our sales and product management functions as adjusted for overall market conditions.

We have agreements with Lanner with an initial term of one year and AEWIN with an initial term of six years pursuant to which they manufacture, assemble, and test our products. Each agreement automatically renews for successive one-year terms unless either party gives notice that they do not want to renew. We do not have any long-term manufacturing contracts that guarantee fixed capacity or pricing. Quality assurance and testing is performed at our San Jose, Taiwan and Japan distribution centers, as well as at our manufacturers' locations. We warehouse and deliver our products out of our San Jose warehouse for the Americas and direct from Taiwan for APAC and EMEA. We outsource delivery to a third-party logistics provider for deliveries in Japan.

Backlog

As of December 31, 2019 and 2018, we had product backlog of approximately $12.9 million and $5.9 million, respectively. Backlog represents orders confirmed with a purchase order for products to be shipped generally within 90 days to customers with approved credit status. Orders may be subject to cancellation, rescheduling by customers and product specification changes by customers. Although we believe that the backlog orders are firm, purchase orders may be canceled by the customer prior to shipment without significant penalty. For this reason, we believe that our product backlog at any given date is not a reliable indicator of future revenues.

For the years ended December 31, 2019, 2018 and 2017, our total revenue was $212.6 million, $232.2 million, and $235.4 million, respectively, and our gross margin was 77.0%, 77.7%, and 77.4%, respectively. We had net losses of $17.8 million, $27.6 million and $10.8 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Intellectual Property

We rely on a combination of patent, copyright, trademark and trade secret laws, and restrictions on disclosure to protect our intellectual property rights. As of December 31, 2019, we had 175 United States (“U.S.”) patents issued and 38 U.S. patent applications pending, and 69 overseas patents issued and 19 overseas patent applications pending. Our issued U.S. patents, excluding 18 patents that we acquired, expire between 2025 and 2038. Our issued overseas patents, excluding 9 patents that we acquired, expire between 2027 and 2037. Our future success depends in part on our ability to protect our proprietary rights to the technologies used in our principal products. Despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy aspects of our products or to obtain and use trade secrets or other information that we regard as proprietary. In addition, the laws of some foreign countries do not protect our proprietary rights as fully as do the laws of the United States. Any issued patent may not preserve our proprietary position, and competitors or others may develop technologies similar to or superior to our technology. Our failure to enforce and protect our intellectual property rights could harm our business, operating results and financial condition.

We license software from third parties for development of or integration into our products, including proprietary and open source software. We pursue registration of our trademarks and domain names in the United States and other jurisdictions. See Part I, Item 1A. Risk Factors included in this Annual Report on Form 10-K for additional information regarding the risks associated with protecting our intellectual property.

Employees

As of December 31, 2019, we had 810 full-time employees, including 403 engaged in research and development and customer support, 318 in sales and marketing and 89 in general and administrative and other activities. None of our employees is represented by a labor union or is a party to any collective bargaining arrangement in connection with his or her employment with us. We have never experienced any work stoppages, and we consider our relations with our employees to be good.

Corporate Information

A10 Networks, Inc. was incorporated in the State of California in 2004 and subsequently reincorporated in the State of Delaware in March 2014. Our website is located at www.A10networks.com, and our investor relations website is located at http://investors.A10networks.com. The following filings are available through our investor relations website after we file them with the SEC: Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, as well as any amendments to such reports and all other filings pursuant to Section 13(a) or 15(d) of the Securities Act. These filings are also available for download free of charge on our investor relations website. Additionally, copies of materials filed by us with the SEC may be accessed at the SEC’s website at www.sec.gov.

We announce material information to the public about A10, our products and services and other matters through a variety of means, including our website (www.A10networks.com), the investor relations section of our website (www.investors.A10networks.com), press releases, filings with the Securities and Exchange Commission, public conference calls, and social media, including our corporate Twitter account (@A10Networks) and our corporate Facebook page (https://www.facebook.com/a10networks). The contents of our website and social media contents are not intended to be incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only. We encourage investors and others to review the information we make public in these locations, as such information could be deemed to be material information. Please note that this list may be updated from time to time.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below, together with all of the other information contained in this report and in our other public filings. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties that we are unaware of, or that we currently believe are not material, may also become important factors that affect us. If any of the following risks occur, our business, financial condition, operating results, and prospects could be materially harmed. In that event, the trading price of our common stock could decline, perhaps significantly.

The Audit Committee's investigation of certain accounting and internal control matters relating to our previously issued financial statements and the audit of our consolidated financial statements as of and for the year ended December 31, 2017 were time-consuming and expensive.

We incurred significant expenses, including audit, legal, consulting and other professional fees, in connection with the Audit Committee's internal investigation, the review of our accounting, the audit of our 2017 financial statements and the ongoing remediation of deficiencies in our internal control over financial reporting. As described in Item 9A, "Controls and Procedures," of this report, we have taken a number of steps in order to strengthen our accounting function and attempt to reduce the risk of future recurrence and errors in accounting determinations. The validation of the efficacy of these remedial steps will result in us incurring near term expenses, and to the extent these steps are not successful, we could be required to incur significant additional time and expense. The incurrence of significant additional expense, or the requirement that management devote significant time that could reduce the time available to execute on our business strategies, could have a material adverse effect on our business, results of operations and financial condition.

If we do not successfully anticipate market needs and opportunities or if the market does not continue to adopt our application networking products, our business, financial condition and results of operations could be significantly harmed.

The application networking market is rapidly evolving and difficult to predict. Technologies, customer requirements, security threats and industry standards are constantly changing. As a result, we must anticipate future market needs and opportunities and then develop new products or enhancements to our current products that are designed to address those needs and opportunities, and we may not be successful in doing so.

In 2020, we plan to introduce several new products. However, even if we are able to anticipate, develop and commercially introduce new products and enhancements that address the market's needs and opportunities, there can be no assurance that new products or enhancements will achieve widespread market acceptance. For example, organizations that use other conventional or first-generation application networking products for their needs may believe that these products are sufficient. In addition, as we launch new product offerings, organizations may not believe that such new product offerings offer any additional benefits as compared to the existing application networking products that they currently use. Accordingly, organizations may continue allocating their IT budgets for existing application networking products and may not adopt our products, regardless of whether our products can offer superior performance or security.

If we fail to anticipate market needs and opportunities or if the market does not continue to adopt our application networking products, then market acceptance and sales of our current and future application networking products could be substantially decreased or delayed, we could lose customers, and our revenue may not grow or may decline. Any of such events would significantly harm our business, financial condition and results of operations.

Our success depends on our timely development of new products and features to address rapid technological changes and evolving customer requirements. If we are unable to timely develop and successfully introduce new products and features that adequately address these changes and requirements, our business and operating results could be adversely affected.

Changes in application software technologies, data center and communications hardware, networking software and operating systems, and industry standards, as well as our end-customers' continuing business growth, result in evolving application networking needs and requirements. Our continued success depends on our ability to identify, develop and introduce in a timely and successful manner, new products and new features for our existing products that meet these needs and requirements.

Our future plans include significant investments in research and development and related product opportunities. Developing our products and related enhancements is time-consuming and expensive. We have made significant investments in our research and development team in order to address these product development needs. Our investments in research and development may not result in significant design and performance improvements or marketable products or features, or may result in products that are more expensive than anticipated. We may take longer to generate revenue, or generate less revenue, than we anticipate from our new products and product enhancements. We believe that we must continue to dedicate a significant amount of resources to our research and development efforts to maintain our competitive position.

In 2020, we plan to introduce several new products. However, if we are unable to develop new products and features to address technological changes and new customer requirements in the application networking or security markets or if our investments in research and development do not yield the expected benefits in a timely manner, our business and operating results could be adversely affected. For example, when the 5G standards are published, we may not be able to produce a satisfactory return on investment if our strategic vision and the resources that we are spending on developing our presence in the 5G technology industry turn out to be misaligned with such standards.

We have experienced net losses in recent periods and may not achieve or maintain profitability in the future. If we cannot achieve or maintain profitability, our financial performance will be harmed and our business may suffer.

We experienced net losses for the years ended December 31, 2019, 2018 and 2017. We also experienced a decline in revenue during the year ended December 31, 2019, as compared to each of the prior two years, including a decrease in revenue in the Americas. Although one of our priorities is to strengthen our sales efforts in the Americas, there can be no assurance that such efforts will be successful.

During the years ended December 31, 2019, 2018 and 2017, we invested in our sales, marketing and research and development teams in order to develop, market and sell our products. We may continue to invest in these areas in the future. As a result of these expenditures, we may have to generate and sustain increased revenue, manage our cost structure and avoid significant liabilities to achieve future profitability.

We may not be able to increase our quarterly revenue or achieve profitability in the future or on a consistent basis, and we may incur significant losses in the future for a number of possible reasons, including our inability to develop products that achieve market acceptance, general economic conditions, increasing competition, decreased growth in the markets in which we operate, or our failure for any reason to capitalize on growth opportunities. Additionally, we may encounter unforeseen operating expenses, difficulties, complications, delays and other unknown factors that may result in losses in future periods. If these losses exceed our expectations or our revenue growth expectations are not met in future periods, our financial performance will be harmed and our stock price could be volatile or decline. In addition, we have developed a cost reduction plan, which we plan to implement in 2020. However, there can be no assurances that the implementation of such plan will be successful.

Our operating results have varied and are likely to continue to vary significantly from period to period and may be unpredictable, which could cause the trading price of our common stock to decline.

Our operating results, in particular, revenue, margins and operating expenses, have fluctuated in the past, and we expect this will continue, which makes it difficult for us to predict our future operating results. The timing and size of sales of our products are highly variable and difficult to predict and can result in significant fluctuations in our revenue from period to period. This is particularly true of sales to our largest end-customers, such as service providers, enterprise customers and governmental organizations, who typically make large and concentrated purchases and for whom close or sales cycles can be long, as a result of their complex networks and data centers, as well as requests that may be made for customized features. Our quarterly results may vary significantly based on when these large end-customers place orders with us and the content of their orders.

Our operating results may also fluctuate due to a number of other factors, many of which are outside of our control and may be difficult to predict. In addition to other risks listed in this "Risk Factors" section, factors that may affect our operating results include:

- fluctuations in and timing of purchases from, or loss of, large customers;
- the budgeting cycles and purchasing practices of end-customers;
- our ability to attract and retain new end-customers;

- changes in demand for our products and services, including seasonal variations in customer spending patterns or cyclical fluctuations in our markets;
- our reliance on shipments at the end of our quarters;
- variations in product mix or geographic locations of our sales, which can affect the revenue we realize for those sales;
- the timing and success of new product and service introductions by us or our competitors;
- our ability to increase the size of our distribution channel and to maintain relationships with important distribution channel partners;
- our ability to improve our overall sales productivity and successfully execute our marketing strategies;
- the effect of currency exchange rates on our revenue and expenses;
- the cost and potential outcomes of existing and future litigation;
- expenses related to our facilities;
- the effect of discounts negotiated by our largest end-customers for sales or pricing pressure from our competitors;
- changes in the growth rate of the application networking or security markets or changes in market needs;
- inventory write downs, which may be necessary for our older products when our new products are launched and adopted by our end-customers; and
- our ability to expand internationally and domestically;
- our ability to implement our cost reduction plan; and
- our third-party manufacturers' and component suppliers' capacity to meet our product demand forecasts on a timely basis, or at all.

Any one of the factors above or the cumulative effect of some of these factors may result in significant fluctuations in our financial and other operating results. This variability and unpredictability could result in our failure to meet our or our investors' or securities analysts' revenue, margin or other operating results expectations for a particular period, resulting in a decline in the trading price of our common stock.

Reliance on shipments at the end of the quarter could cause our revenue for the applicable period to fall below expected levels.

As a result of end-customer buying patterns and the efforts of our sales force and distribution channel partners to meet or exceed their sales objectives, we have historically received a substantial portion of purchase orders and generated a substantial portion of revenue during the last few weeks of each quarter. We may be able to recognize such revenue in the quarter received, however, only if all of the requirements of revenue recognition are met by the end of the quarter. Any significant interruption in our information technology systems, which manage critical functions such as order processing, revenue recognition, financial forecasts, inventory and supply chain management, could result in delayed order fulfillment and thus decreased revenue for that quarter. If expected revenue at the end of any quarter is delayed for any reason, including the failure of anticipated purchase orders to materialize (including delays by our customers or potential customers in consummating such purchase orders), our third-party manufacturers' inability to manufacture and ship products prior to quarter-end to fulfill purchase orders received near the end of the quarter, our failure to manage inventory to meet demand, our inability to release new products on schedule, any failure of our systems related to order review and processing, or any delays in shipments or achieving specified acceptance criteria, our revenue for that quarter could fall below our, or our investors' or securities analysts' expectations, resulting in a decline in the trading price of our common stock.

We face intense competition in our market, especially from larger, well-established companies, and we may lack sufficient financial or other resources to maintain or improve our competitive position.

The application networking and security markets are intensely competitive, and we expect competition to increase in the future. To the extent that we sell our solutions in adjacent markets, we expect to face intense competition in those markets as well. We believe that our main competitors fall into the following categories:

- Companies that sell products in the traditional ADC market, such as F5 Networks, Inc. (''F5 Networks'') and Citrix Systems, Inc. (''Citrix Systems'');
- Companies that sell open source, software-only, cloud-based ADC services, such as Avi Networks Inc. (''Avi Networks''), NGINX Inc. (''NGiNX''), and HAProxy Technologies, Inc. (''HAProxy'') as well as many startups;
- Companies that sell CGN products, which were originally designed for other networking purposes, such as edge routers and security appliances from vendors like Cisco Systems, Inc. (''Cisco Systems''), Juniper Networks, Inc. (''Juniper Networks'') and Fortinet, Inc. (''Fortinet'');
- Companies that sell traditional DDoS protection products, such as Arbor Networks, Inc., a subsidiary of NetScout Systems, (''Arbor Networks'') and Radware, Ltd. (''Radware'');
- Companies that sell SSL decryption and inspection products, such as Symantec Corporation (through its acquisition of Blue Coat Systems Inc. in 2016) and F5 Networks; and
- Companies that sell certain network security products, including Secure Web Gateways, SSL Insight/SSL Intercept, data center firewalls and Office 365 proxy solutions.

Many of our competitors are substantially larger and have greater financial, technical, research and development, sales and marketing, manufacturing, distribution and other resources and greater name recognition. In addition, some of our larger competitors have broader products offerings and could leverage their customer relationships based on their other products. Potential customers who have purchased products from our competitors in the past may also prefer to continue to purchase from these competitors rather than change to a new supplier regardless of the performance, price or features of the respective products. We could also face competition from new market entrants, which may include our current technology partners. As we continue to expand globally, we may also see new competitors in different geographic regions. Such current and potential competitors may also establish cooperative relationships among themselves or with third parties that may further enhance their resources.

Many of our existing and potential competitors enjoy substantial competitive advantages, such as:

- longer operating histories;
- the capacity to leverage their sales efforts and marketing expenditures across a broader portfolio of products and services at a greater range of prices including through selling at zero or negative margins;
- the ability to incorporate functionality into existing products to gain business in a manner that discourages users from purchasing our products, including through product bundling or closed technology platforms;
- broader distribution and established relationships with distribution channel partners in a greater number of worldwide locations;
- access to larger end-customer bases;
- the ability to use their greater financial resources to attract our research and development engineers as well as other employees of ours;
- larger intellectual property portfolios; and
- the ability to bundle competitive offerings with other products and services.

Our ability to compete will depend upon our ability to provide a better solution than our competitors at a competitive price. We may be required to make substantial additional investments in research and development, marketing and sales in order to respond to competition, and there is no assurance that these investments will achieve any returns for us or that we will be able to compete successfully in the future. We also expect increased competition if our market continues to expand. Moreover, conditions in our market could change rapidly and significantly as a result of technological advancements or other factors.

In addition, current or potential competitors may be acquired by third parties that have greater resources available. As a result of these acquisitions, our current or potential competitors might take advantage of the greater resources of the larger organization to compete more vigorously or broadly with us. In addition, continued industry consolidation might adversely impact end-customers' perceptions of the viability of smaller and even medium-sized networking companies and, consequently, end-customers' willingness to purchase from companies like us.

As a result, increased competition could lead to fewer end-customer orders, price reductions, reduced margins and loss of market share.

Cloud-based computing trends present competitive and execution risks.

We are experiencing an industry-wide trend of customers considering transitioning from purely on-premise network architectures to a computing environment that may utilize a mixture of existing solutions and various new cloud-based solutions. Concurrently with this transition, pricing and delivery models are also evolving. Many companies in our industry, including some of our competitors, are developing and deploying cloud-based solutions for their customers. In addition, the emergence of new cloud infrastructures may enable new companies to compete with our business. These new competitors may include large cloud providers who can provide their own ADC functionality as well as smaller companies targeting applications that are developed exclusively for delivery in the cloud. We are dedicating significant resources to develop and offer our customers new cloud-based solutions. Also, some of our largest customers are cloud providers that utilize our existing solutions, and we believe that as cloud infrastructures continue to grow our existing solutions may provide benefits to other cloud providers. While we believe our expertise and dedication of resources to developing new cloud-based solutions, together with the benefits that our existing solutions offer cloud providers, represent advantages that provide us with a strong foundation to compete, it is uncertain whether our efforts to develop new cloud-based solutions or our efforts to market and sell our existing solutions to cloud providers will attract the customers or generate the revenue necessary to successfully compete in this new business model. Nor is it clear when or in what manner this new business model will evolve, and this uncertainty may delay purchasing decisions by our customers or prospective customers. Whether we are able to successfully compete depends on our execution in a number of areas, including maintaining the utility, compatibility and performance of our software on the growing assortment of cloud computing platforms and the enhanced interoperability requirements associated with orchestration of cloud computing environments. Any failure to adapt to these evolving trends may reduce our revenue or operating margins and could have a material adverse effect on our business, results of operations and financial condition.

If we are unable to attract new end-customers, sell additional products to our existing end-customers or achieve the anticipated benefits from our investment in additional sales personnel and resources, our revenue may decline, and our gross margin will be adversely affected.

To maintain and increase our revenue, we must continually add new end-customers and sell additional products to existing end-customers. The rate at which new and existing end-customers purchase solutions depends on a number of factors, including some outside of our control, such as general economic conditions. If our efforts to sell our solutions to new end-customers and additional solutions to our existing end-customers are not successful, our business and operating results will suffer.

In certain recent periods, we have added personnel and other resources to our sales and marketing functions, as we focused on growing our business, entering new markets and increasing our market share. We may incur additional expenses by hiring additional sales and marketing personnel and expanding our international operations in order to seek revenue growth. The return on these and future investments may be lower, or may be realized more slowly, than we expect, if realized at all. If we do not achieve the benefits anticipated from these investments, or if the achievement of these benefits is delayed, our growth rates will decline, and our gross margin would likely be adversely affected.

If we are not able to maintain and enhance our brand and reputation, our business and operating results may be harmed in tangible or intangible ways.

We believe that maintaining and enhancing our brand and reputation are critical to our relationships with, and our ability to attract, new end-customers, technology partners and employees. The successful promotion of our brand will depend largely upon our ability to continue to develop, offer and maintain high-quality products and services, our marketing and public relations efforts, and our ability to differentiate our products and services successfully from

those of our competitors. Our brand promotion activities may not be successful and may not yield increased revenue. In addition, extension of our brand to products and uses different from our traditional products and services may dilute our brand, particularly if we fail to maintain the quality of products and services in these new areas. We have in the past, and may in the future, become involved in litigation that could negatively affect our brand. If we do not successfully maintain and enhance our brand and reputation, our growth rate may decline, we may have reduced pricing power relative to competitors with stronger brands or reputations, and we could lose end-customers or technology partners, all of which would harm our business, operating results and financial condition.

A limited number of our end-customers, including service providers, make large and concentrated purchases that comprise a significant portion of our revenue. Any loss or delay of expected purchases by our largest end-customers could adversely affect our operating results.

As a result of the nature of our target market and the current stage of our development, a substantial portion of our revenue in any period comes from a limited number of large end-customers, including service providers. During the years ended December 31, 2019, 2018 and 2017, purchases by our ten largest end-customers accounted for approximately 36%, 37% and 35% of our total revenue, respectively. The composition of the group of these ten largest end-customers changes from period to period, but often includes service providers and enterprise customers. During the years ended December 31, 2019, 2018 and 2017, service providers accounted for approximately 58%, 57% and 56%, of our total revenue, respectively, and enterprise customers accounted for approximately 42%, 43% and 44% of our total revenue, respectively.

Sales to these large end-customers have typically been characterized by large but irregular purchases with long initial sales cycles. After initial deployment, subsequent purchases of our products typically have a more compressed sales cycle. The timing of these purchases and of the requested delivery of the purchased product is difficult to predict. As a consequence, any acceleration or delay in anticipated product purchases by or requested deliveries to our largest end-customers could materially affect our revenue and operating results in any quarter and cause our quarterly revenue and operating results to fluctuate from quarter to quarter.

We cannot provide any assurance that we will be able to sustain or increase our revenue from our largest end-customers nor that we will be able to offset any absence of significant purchases by our largest end-customers in any particular period with purchases by new or existing end-customers in that or a subsequent period. We expect that sales of our products to a limited number of end-customers will continue to contribute materially to our revenue for the foreseeable future. The loss of, or a significant delay or reduction in purchases by, a small number of end-customers could have a material adverse effect on our consolidated financial position, results of operations or cash flows.

Our business could be adversely impacted by changes demanded by our customers in the deployment and payment models for our products.

Our customers have traditionally demanded products deployed in physical, appliance-based on-premise data centers that are paid in full at the time of purchase and include perpetual licenses for our software products. While these products remain central to our business, new deployment and payment models are emerging in our industry that may provide some of our customers with additional technical, business agility and flexibility options. These new models include cloud-based applications provided as SaaS and software subscription licenses where license and service fees are ratable and correlate to the type of service used, the quantity of services consumed or the length of time of the subscription. These models have accounting treatments that may require us to recognize revenue ratably over an extended period of time. If a substantial portion of our customers transition from on-premise-based products to such cloud-based, consumption and subscription-based models, this could adversely affect our operating results and could make it more difficult to compare our operating results during such transition period with our historical operating results.

Some of our large end-customers demand favorable terms and conditions from their vendors and may request price or other concessions from us. As we seek to sell more products to these end-customers, we may agree to terms and conditions that may have an adverse effect on our business.

Some of our large end-customers have significant purchasing power and, accordingly, may request from us and receive more favorable terms and conditions, including lower prices than we typically provide. As we seek to sell products to this class of end-customer, we may agree to these terms and conditions, which may include terms that reduce our gross margin and have an adverse effect on our business.

Our gross margin may fluctuate from period to period based on the mix of products sold, the geographic location of our customers, price discounts offered, required inventory write downs and exchange rate fluctuations.

Our gross margin may fluctuate from period to period in response to a number of factors, such as the mix of our products sold and the geographic locations of our sales. Our products tend to have varying gross margins in different geographic regions. We also may offer pricing discounts from time to time as part of a targeted sales campaign or as a result of pricing pressure from our competitors. In addition, our larger end-customers may negotiate pricing discounts in connection with large orders they place with us. The sale of our products at discounted prices could have a negative impact on our gross margin. We also must manage our inventory of existing products when we introduce new products.

If we are unable to sell the remaining inventory of our older products prior to or following the launch of such new product offerings, we may be forced to write down inventory for such older products, which could also negatively affect our gross margin. Our gross margin may also vary based on international currency exchange rates. In general, our sales are denominated in U.S. dollars; however, in Japan they are denominated in Japanese yen. Changes in the exchange rate between the U.S. dollar and the Japanese yen may therefore affect our actual revenue and gross margin.

We have been, may presently be, or in the future may be, a party to litigation and claims regarding intellectual property rights, resolution of which has been and may in the future be time-consuming, expensive and adverse to us, as well as require a significant amount of resources to prosecute, defend, or make our products non-infringing.

Our industry is characterized by the existence of a large number of patents and by increasingly frequent claims and related litigation based on allegations of infringement or other violations of patent and other intellectual property rights. In the ordinary course of our business, we have been and may presently be in disputes and licensing discussions with others regarding their patents and other claimed intellectual property and proprietary rights. Intellectual property infringement and misappropriation lawsuits and other claims are subject to inherent uncertainties due to the complexity of the technical and legal issues involved, and we cannot be certain that we will be successful in defending ourselves against such claims or in concluding licenses on reasonable terms or at all.

We may have fewer issued patents than some of our major competitors, and therefore may not be able to utilize our patent portfolio effectively to assert defenses or counterclaims in response to patent infringement claims or litigation brought against us by third parties. Further, litigation may involve patent holding companies or other adverse patent owners that have no relevant products revenue and against which our potential patents may provide little or no deterrence. In addition, many potential litigants have the capability to dedicate substantially greater resources than we can to enforce their intellectual property rights and to defend claims that may be brought against them. We expect that infringement claims may increase as the number of product types and the number of competitors in our market increases. Also, to the extent we gain greater visibility, market exposure and competitive success, we face a higher risk of being the subject of intellectual property infringement claims.

If we are found in the future to infringe the proprietary rights of others, or if we otherwise settle such claims, we could be compelled to pay damages or royalties and either obtain a license to those intellectual property rights or alter our products such that they no longer infringe. Any license could be very expensive to obtain or may not be available at all. Similarly, changing our products or processes to avoid infringing the rights of others may be costly, time-consuming or impractical. Alternatively, we could also become subject to an injunction or other court order that could prevent us from offering our products. Any of these claims, regardless of their merit, may be time-consuming, result in costly litigation and diversion of technical and management personnel, or require us to cease using infringing technology, develop non-infringing technology or enter into royalty or licensing agreements.

Many of our commercial agreements require us to indemnify our end-customers, distributors and resellers for certain third-party intellectual property infringement actions related to our technology, which may require us to defend or otherwise become involved in such infringement claims, and we could incur liabilities in excess of the amounts we have received for the relevant products and/or services from our end-customers, distributors or resellers. These types of claims could harm our relationships with our end-customers, distributors and resellers, may deter future end-customers from purchasing our products or could expose us to litigation for these claims. Even if we are not a party to any litigation between an end-customer, distributor or reseller, on the one hand, and a third party, on the other hand, an adverse outcome in any such litigation could make it more difficult for us to defend our intellectual property rights in any subsequent litigation in which we are a named party.

We may not be able to adequately protect our intellectual property, and if we are unable to do so, our competitive position could be harmed, or we could be required to incur significant expenses to enforce our rights.

We rely on a combination of patent, copyright, trademark and trade secret laws, and contractual restrictions on disclosure of confidential and proprietary information, to protect our intellectual property. Despite the efforts we take to protect our intellectual property and other proprietary rights, these efforts may not be sufficient or effective at preventing their unauthorized use. In addition, effective trademark, patent, copyright and trade secret protection may not be available or cost-effective in every country in which we have rights. There may be instances where we are not able to protect intellectual property or other proprietary rights in a manner that maximizes competitive advantage. If we are unable to protect our intellectual property and other proprietary rights from unauthorized use, the value of those assets may be reduced, which could negatively impact our business.

We also rely in part on confidentiality and/or assignment agreements with our technology partners, employees, consultants, advisors and others. These protections and agreements may not effectively prevent disclosure of our confidential information and may not provide an adequate remedy in the event of unauthorized disclosure. In addition, others may independently discover our trade secrets and intellectual property information we thought to be proprietary, and in these cases we would not be able to assert any trade secret rights against those parties. Despite our efforts to protect our intellectual property, unauthorized parties may attempt to copy or otherwise obtain and use our intellectual property or technology. Monitoring unauthorized use of our intellectual property is difficult and expensive. We have not made such monitoring a priority to date and will not likely make this a priority in the future. We cannot be certain that the steps we have taken or will take will prevent misappropriation of our technology, particularly in foreign countries where the laws may not protect our proprietary rights as fully as in the United States.

If we fail to protect our intellectual property adequately, our competitors might gain access to our technology, and our business might be harmed. In addition, even if we protect our intellectual property, we may need to license it to competitors, which could also be harmful. For example, as a result of the settlement of an intellectual property matter, we have already licensed all of our issued patents, pending applications, and future patents and patent applications that we may acquire, obtain, apply for or have a right to license to Brocade Communications Systems, Inc. until May 2025, for the life of each such patent. In addition, we might incur significant expenses in defending our intellectual property rights. Any of our patents, copyrights, trademarks or other intellectual property rights could be challenged by others or invalidated through administrative process or litigation.

We may in the future initiate claims or litigation against third parties for infringement of our proprietary rights or to establish the validity of our proprietary rights. Any litigation, whether or not resolved in our favor, could result in significant expense to us and divert the efforts of our management and technical personnel, as well as cause other claims to be made against us, which might adversely affect our business, operating results and financial condition.

We generate a significant amount of revenue from sales to distributors, resellers, and end-customers outside of the United States, and we are therefore subject to a number of risks that could adversely affect these international sources of our revenue.

A significant portion of our revenue is generated in international markets, including Japan, Western Europe, China, Taiwan and South Korea. During the years ended December 31, 2019, 2018 and 2017, approximately 64%, 55% and 51% of our total revenue, respectively, was generated from customers located outside of the United States. If we are unable to maintain or continue to grow our revenue in these markets, our financial results may suffer.

As a result, we must hire and train experienced personnel to staff and manage our foreign operations. To the extent that we experience difficulties in recruiting, training, managing and retaining an international staff, and specifically sales management and sales personnel, we may experience difficulties in sales productivity in foreign markets. We also seek to enter into distributor and reseller relationships with companies in certain international markets where we do not have a local presence. If we are not able to maintain successful distributor relationships internationally or recruit additional companies to enter into distributor relationships, our future success in these international markets could be limited. Business practices in the international markets that we serve may differ from those in the United States and may require us in the future to include terms in customer contracts other than our standard terms. To the extent that we may enter into customer contracts in the future that include non-standard terms, our operating results may be adversely impacted.

We have a significant presence in international markets and plan to continue to expand our international operations, which exposes us to a number of risks that could affect our future growth.

Our sales team is comprised of field sales and inside sales personnel who are organized by geography and maintain sales presence in 28 countries as of December 31, 2019, including in the following countries and regions: the United States, Western Europe, the Middle East, Japan, China, Taiwan, South Korea, Southeast Asia and Latin America. We expect to continue to increase our sales headcount in all markets, particularly in markets where we currently do not have a sales presence. As we continue to expand our international sales and operations, we are subject to a number of risks, including the following:

- greater difficulty in enforcing contracts and accounts receivable collection and possible longer collection periods;
- increased expenses incurred in establishing and maintaining office space and equipment for our international operations;
- greater difficulty in recruiting local experienced personnel, and the costs and expenses associated with such activities;
- general economic and political conditions in these foreign markets;
- economic uncertainty around the world, including continued economic uncertainty as a result of sovereign debt issues in Europe and the United Kingdom's exit from the European Union (commonly referred to as "Brexit");
- management communication and integration problems resulting from cultural and geographic dispersion;
- risks associated with trade restrictions and foreign legal requirements, including the importation, certification, and localization of our products required in foreign countries;
- greater risk of unexpected changes in regulatory practices, tariffs, and tax laws and treaties;
- the uncertainty of protection for intellectual property rights in some countries;
- greater risk of a failure of foreign 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; and
- heightened risk of unfair or corrupt business practices in certain geographies and of improper or fraudulent sales arrangements that may impact financial results and result in restatements of, or irregularities in, financial statements.

Because of our worldwide operations, we are also subject to risks associated with compliance with applicable anticorruption laws. One such applicable anticorruption law is the FCPA, which generally prohibits U.S. companies and their employees and intermediaries from making payments to foreign officials for the purpose of obtaining or keeping business, securing an advantage, or directing business to another, and requires public companies to maintain accurate books and records and a system of internal accounting controls. Under the FCPA, U.S. companies may be held liable for actions taken by directors, officers, employees, agents, or other strategic or local partners or representatives. As such, if we or our intermediaries, such as channel partners and distributors, fail to comply with the requirements of the FCPA or similar legislation, governmental authorities in the United States and elsewhere could seek to impose civil and/or criminal fines and penalties which could have a material adverse effect on our business, operating results and financial condition.

Currently, China and other countries are facing a coronavirus pandemic. The impact of the pandemic has significantly affected business and other activities within China, including travel to, from and within mainland China. We employ sales and engineering personnel in China, many of whom are currently working from their homes and may continue to be negatively affected by the pandemic. Our annual revenues in China typically represent not more than approximately 5% of our total revenues. However, business interruptions that are sustained for an extended time period due to the outbreak could have a material negative impact on our business and operations. The supply chains of our contract manufacturers' and many of our vendors may source products, parts or components from China, countries near China and the region. There are many uncertainties around COVID-19, including scientific and health issues, the unknown duration and extent of economic disruption in China and other markets, and the impact, if any, on the Chinese, U.S., and global economies. As a result, COVID-19 may result in supply shortages of our products

or our ability to import, export or sell product to customers in U.S. and international markets. Any decrease, limitations or delays on our ability to import, export, or sell our products would harm our business. If the pandemic spreads to other countries where, individually or in the aggregate, our sales and operations are more significant, the potential impact and risk to our business and operations will increase. To date, we have not seen any material negative impact on our business, but we cannot predict what impacts may arise in the future due to the evolving nature of the pandemic.

We are exposed to fluctuations in currency exchange rates, which could negatively affect our results of operations.

Our consolidated results of operations, financial position and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. Historically, the majority of our revenue contracts are denominated in U.S. dollars, with the most significant exception being Japan, where we invoice primarily in the Japanese yen. Our expenses are generally denominated in the currencies in which our operations are located, which is primarily in the Americas and EMEA. Revenue resulting from selling in local currencies and costs incurred in local currencies are exposed to foreign currency exchange rate fluctuations that can affect our operating income. The currency exchange impact of the foreign exchange rates on our net loss was $1.4 million, $0.7 million and $0.4 million unfavorable for the years ended December 31, 2019, 2018 and 2017, respectively. As exchange rates vary, our operating income may differ from expectations. We deploy normal and customary hedging practices that are designed to proactively mitigate such exposure. The use of such hedging activities may not offset any, or more than a portion, of the adverse financial effects of unfavorable movements in currency exchange rates over the limited time the hedges are in place and would not protect us from long term shifts in currency exchange rates.

Our success depends on our key personnel and our ability to hire, retain and motivate qualified product development, sales, marketing and finance personnel.

Our success depends to a significant degree upon the continued contributions of our key management, product development, sales, marketing and finance personnel, many of whom may be difficult to replace. The complexity of our products, their integration into existing networks and ongoing support of our products requires us to retain highly trained professional services, customer support and sales personnel with specific expertise related to our business. Competition for qualified professional services, customer support, engineering and sales personnel in our industry is intense, because of the limited number of people available with the necessary technical skills and understanding of our products. Our ability to recruit and hire these personnel is harmed by tightening labor markets, particularly in the engineering field, in several of our key geographic hiring areas. We may not be successful in attracting, integrating, or retaining qualified personnel to fulfill our current or future needs, nor may we be successful in keeping the qualified personnel we currently have. Our ability to hire and retain these personnel may be adversely affected by volatility or reductions in the price of our common stock, since these employees are generally granted equity-based awards.

Our future performance also depends on the continued services and continuing contributions of certain employees and members of senior management to execute on our business plan and to identify and pursue new opportunities and product innovations. Our senior management team, significant employees with technical expertise, and product and sales managers, among others, are critical to the development of our technology and the future vision and strategic direction of our company. The loss of their services could significantly delay or prevent the achievement of our development and strategic objectives, which could adversely affect our business, financial condition, and operating results.

There can be no assurance that our exploration of strategic alternatives will result in any transaction being consummated, and speculation and uncertainty regarding the outcome of our exploration of strategic alternatives may adversely impact our business.

On July 30, 2019, we announced that our Board of Directors has formed a Strategy Committee tasked and empowered with overseeing and executing specific activities directed to increasing shareholder value. In furtherance of these activities, we retained Bank of America Merrill Lynch to advise us and the Board of Directors on strategic matters, including a near term exploration of a potential sale or change of control transaction. No assurance can be given that such a transaction will be consummated in the near term or at all. In addition, speculation and uncertainty regarding our exploration of strategic alternatives may cause or result in:

- disruption of our business;

- distraction of our management and employees;
- difficulty in recruiting, hiring, motivating, and retaining talented and skilled personnel;
- difficulty in maintaining or negotiating and consummating new, business or strategic relationships or transactions;
- increased stock price volatility; and
- increased costs and advisory fees.

If we are unable to mitigate these or other potential risks related to the uncertainty caused by our exploration of strategic alternatives, it may disrupt our business or adversely impact our revenue, operating results, and financial condition.

Adverse general economic conditions or reduced information technology spending may adversely impact our business.

A substantial portion of our business depends on the demand for information technology by large enterprises and service providers, the overall economic health of our current and prospective end-customers and the continued growth and evolution of the Internet. The timing of the purchase of our products is often discretionary and may involve a significant commitment of capital and other resources. Volatility in the global economic market or other effects of global or regional economic weakness, including limited availability of credit, a reduction in business confidence and activity, deficit-driven austerity measures that continue to affect governments and educational institutions, and other difficulties may affect one or more of the industries to which we sell our products and services. If economic conditions in the United States, Europe and other key markets for our products continue to be volatile or do not improve or those markets experience another downturn, many end-customers may delay or reduce their IT spending. This could result in reductions in sales of our products and services, longer sales cycles, slower adoption of new technologies and increased price competition. Any of these events would likely harm our business, operating results and financial condition. In addition, there can be no assurance that IT spending levels will increase following any recovery.

Exposure to UK political developments, including the effects of Brexit, could have a material adverse effect on us.

On January 31, 2020, the United Kingdom (“UK”) left the European Union (“EU”), which began a transition period until the end of 2020 during which the UK and the EU will negotiate additional arrangements.

The effects of Brexit will depend on agreements the UK makes to retain access to EU markets following the transition period. Brexit creates an uncertain political and economic environment in the UK and potentially across other EU member states for the foreseeable future, including during the transition period and such uncertainties could impair or limit our ability to transact business in the member EU states.

The political and economic uncertainty created by Brexit has caused and may continue to cause significant volatility in global financial markets and in the value of the Pound Sterling currency or other currencies, including the Euro. Depending on the final terms reached between the UK and the EU, it is possible that there may be adverse practical and/or operational implications on our business.

Consequently, no assurance can be given as to the overall impact of Brexit and, in particular, no assurance can be given that our operating results, financial condition and prospects would not be adversely impacted by the result.

Enhanced United States tariffs import/export restrictions, Chinese regulations or other trade barriers may have a negative effect on global economic conditions, financial markets and our business.

There is currently significant uncertainty about the future relationship between the United States and various other countries, most significantly China, with respect to trade policies, treaties, tariffs and taxes. The current U.S. presidential administration has called for substantial changes to U.S. foreign trade policy with respect to China and other countries, including the possibility of imposing greater restrictions on international trade and significant increases in tariffs on goods imported into the United States. In 2018, the Office of the U.S. Trade Representative (the “USTR”) enacted tariffs on imports into the U.S. from China, including communications equipment products and components manufactured and imported from China. An increase in tariffs will cause our costs to increase, which could narrow the profits we earn from sales of products requiring such materials. Furthermore, if tariffs, trade

restrictions, or trade barriers are placed on products such as ours by foreign governments, especially China, the prices for our products may increase, which may result in the loss of customers and harm to our business, financial condition and results of operations. There can be no assurance that we will not experience a disruption in business related to these or other changes in trade practices and the process of changing suppliers in order to mitigate any such tariff costs could be complicated, time consuming and costly.

Furthermore, the U.S. tariffs may cause customers to delay orders as they evaluate where to take delivery of our products in connection with their efforts to mitigate their own tariff exposure. Such delays create forecasting difficulties for us and increase the risk that orders might be canceled or might never be placed. Current or future tariffs imposed by the U.S. may also negatively impact our customers' sales, thereby causing an indirect negative impact on our own sales. Any reduction in customers' sales, and/or any apprehension among distributors and customers of a possible reduction in such sales, would likely cause an indirect negative impact on our own sales.

Additionally, the current uncertainty about the future relationship between the United States and other countries with respect to the trade policies, treaties, taxes, government regulations and tariffs makes it difficult to plan for the future. New developments in these areas, or the perception that any of them could occur, may have a material adverse effect on global economic conditions and the stability of global financial markets, and may significantly reduce global trade and, in particular, trade between these nations and the United States. Any of these factors could depress economic activity and restrict our access to suppliers or customers and have a material adverse effect on our business, financial condition and results of operations and affect our strategy in China and elsewhere around the world. Given the uncertainty of further developments related to tariffs, international trade agreements and policies we can give no assurance that our business, financial condition and operating results would not be adversely affected.

We are dependent on third-party manufacturers, and changes to those relationships, expected or unexpected, may result in delays or disruptions that could harm our business.

We outsource the manufacturing of our hardware components to third-party original design manufacturers who assemble these hardware components to our specifications. Our primary manufacturers are Lanner and AEWIN, each of which is located in Taiwan. Our reliance on these third-party manufacturers reduces our control over the manufacturing process and exposes us to risks, including reduced control over quality assurance, product costs, and product supply and timing. Any manufacturing disruption at these manufacturers could severely impair our ability to fulfill orders. Our reliance on outsourced manufacturers also may create the potential for infringement or misappropriation of our intellectual property rights or confidential information. If we are unable to manage our relationships with these manufacturers effectively, or if these manufacturers suffer delays or disruptions for any reason, experience increased manufacturing lead-times, experience capacity constraints or quality control problems in their manufacturing operations, or fail to meet our future requirements for timely delivery, our ability to ship products to our end-customers would be severely impaired, and our business and operating results would be seriously harmed.

These manufacturers typically fulfill our supply requirements on the basis of individual orders. We do not have long-term contracts with our manufacturers that guarantee capacity, the continuation of particular pricing terms, or the extension of credit limits. Accordingly, they are not obligated to continue to fulfill our supply requirements, which could result in supply shortages, and the prices we are charged for manufacturing services could be increased on short notice. In addition, our orders may represent a relatively small percentage of the overall orders received by our manufacturers from their customers. As a result, fulfilling our orders may not be considered a priority by one or more of our manufacturers in the event the manufacturer is constrained in its ability to fulfill all of its customer obligations in a timely manner.

Although the services required to manufacture our hardware components may be readily available from a number of established manufacturers, it is time-consuming and costly to qualify and implement such relationships. If we are required to change manufacturers, whether due to an interruption in one of our manufacturers' businesses, quality control problems or otherwise, or if we are required to engage additional manufacturers, our ability to meet our scheduled product deliveries to our customers could be adversely affected, which could cause the loss of sales to existing or potential customers, delayed revenue or an increase in our costs that could adversely affect our gross margin.

Because some of the key components in our products come from limited sources of supply, we are susceptible to supply shortages or supply changes, which could disrupt or delay our scheduled product deliveries to our end-customers and may result in the loss of sales and end-customers.

Our products incorporate key components, including certain integrated circuits that we and our third-party manufacturers purchase on our behalf from a limited number of suppliers, including some sole-source providers. In addition, the lead times associated with these and other components of our products can be lengthy and preclude rapid changes in quantities and delivery schedules. Moreover, long-term supply and maintenance obligations to our end-customers increase the duration for which specific components are required, which may further increase the risk we may incur component shortages or the cost of carrying inventory. If we are unable to obtain a sufficient quantity of these components in a timely manner for any reason, sales and/or shipments of our products could be delayed or halted, which would seriously affect present and future sales and cause damage to end-customer relationships, which would, in turn, adversely affect our business, financial condition and results of operations.

In addition, our component suppliers change their selling prices frequently in response to market trends, including industry-wide increases in demand, and because we do not necessarily have contracts with these suppliers, we are susceptible to price fluctuations related to raw materials and components. If we are unable to pass component price increases along to our end-customers or maintain stable pricing, our gross margin and operating results could be negatively impacted. Furthermore, poor quality in sole-sourced components or certain other components in our products could also result in lost sales or lost sales opportunities. If the quality of such components does not meet our standards or our end-customers' requirements, if we are unable to obtain components from our existing suppliers on commercially reasonable terms, or if any of our sole source providers cease to continue to manufacture such components or to remain in business, we could be forced to redesign our products and qualify new components from alternate suppliers. The development of alternate sources for those components can be time-consuming, difficult and costly, and we may not be able to develop alternate or second sources in a timely manner. Even if we are able to locate alternate sources of supply, we could be forced to pay for expedited shipments of such components or our products at dramatically increased costs.

Real or perceived defects, errors, or vulnerabilities in our products or services or the failure of our products or services to block a threat or prevent a security breach could harm our reputation and adversely impact our results of operations.

Because our products and services are complex, they have contained and may contain design or manufacturing defects or errors that are not detected until after their commercial release and deployment by our customers. Even if we discover those weaknesses, we may not be able to correct them promptly, if at all. Defects may cause our products to be vulnerable to security attacks, cause them to fail to help secure networks, or temporarily interrupt end-customers' networking traffic. Furthermore, our products may fail to detect or prevent malware, viruses, worms or similar threats for any number of reasons, including our failure to enhance and expand our platform to reflect industry trends, new technologies and new operating environments, the complexity of the environment of our end-customers and the sophistication of malware, viruses and other threats. Data thieves and hackers are increasingly sophisticated, often affiliated with organized crime or state-sponsored groups, and may operate large-scale and complex automated attacks. The techniques used to obtain unauthorized access or to sabotage networks change frequently and may not be recognized until launched against a target. Additionally, as a well-known provider of enterprise security solutions, our networks, products, and services could be targeted by attacks specifically designed to disrupt our business and harm our reputation. As our products are adopted by an increasing number of enterprises and governments, it is possible that the individuals and organizations behind advanced attacks will focus on finding ways to defeat our products. In addition, defects or errors in our updates to our products could result in a failure of our services to effectively update end-customers' products and thereby leave our end-customers vulnerable to attacks. Our data centers and networks may experience technical failures and downtime, may fail to distribute appropriate updates, or may fail to meet the increased requirements of a growing installed end-customer base, any of which could temporarily or permanently expose our end-customers' networks, leaving their networks unprotected against security threats. Our end-customers may also misuse or wrongly configure our products or otherwise fall prey to attacks that our products cannot protect against, which may result in loss or a breach of business data, data being inaccessible due to a ''ransomware'' attack, or other security incidents. For all of these reasons, we may be unable to anticipate all data security threats or provide a solution in time to protect our end-customers' networks. If we fail to identify and respond to new and increasingly complex methods of attack and to update our products to detect or prevent such threats in time to protect our end-customers' critical business data, our business, operating results and reputation could suffer.

If any companies or governments that are publicly known to use our platform are the subject of a cyberattack that becomes publicized, our other current or potential channel partners or end-customers may look to our competitors for alternatives to our products. Real or perceived security breaches of our end-customers' networks could cause disruption or damage to their networks or other negative consequences and could result in negative publicity to us, damage to our reputation, declining sales, increased expenses and end-customer relations issues. To the extent potential end-customers or industry analysts believe that the occurrence of any actual or perceived failure of our products to detect or prevent malware, viruses, worms or similar threats is a flaw or indicates that our products do not provide significant value, our reputation and business could be harmed.

Any real or perceived defects, errors, or vulnerabilities in our products, or any failure of our products to detect a threat, could result in:

- a loss of existing or potential end-customers or channel partners;
- delayed or lost revenue;
- a delay in attaining, or the failure to attain, market acceptance;
- the expenditure of significant financial and product development resources in efforts to analyze, correct, eliminate, or work around errors or defects, to address and eliminate vulnerabilities, to remediate harms potentially caused by those vulnerabilities, or to identify and ramp up production with third-party providers;
- an increase in warranty claims, or an increase in the cost of servicing warranty claims, either of which would adversely affect our gross margins;
- harm to our reputation or brand; and
- litigation, regulatory inquiries, or investigations that may be costly and further harm our reputation.

Although we maintain cyber liability coverage that may cover certain liabilities in connection with a security breach, we cannot be certain that our insurance coverage will be adequate for liabilities actually incurred, that insurance will continue to be available to use on commercially reasonable terms, or at all, or that any insurer will not deny coverage as to any future claim. The successful assertion of one or more large claims against us that exceed available insurance coverage, or the occurrence of changes in our insurance policies, including premium increases or the imposition of large deductible or co-insurance requirements, could have a material adverse effect on our business, including our financial condition, results of operation and reputation.

Our business is subject to the risks of warranty claims, product returns, product liability, and product defects.

Real or perceived errors, failures or bugs in our products could result in claims by end-customers for losses that they sustain. If end-customers make these types of claims, we may be required, or may choose, for customer relations or other reasons, to expend additional resources in order to help correct the problem. Historically, the amount of warranty claims has not been significant, but there are no assurances that the amount of such claims will not be material in the future. Liability provisions in our standard terms and conditions of sale, and those of our resellers and distributors, may not be enforceable under some circumstances or may not fully or effectively protect us from customer claims and related liabilities and costs, including indemnification obligations under our agreements with resellers, distributors or end-customers. The sale and support of our products also entail the risk of product liability claims. We maintain insurance to protect against certain types of claims associated with the use of our products, but our insurance coverage may not adequately cover any such claims. In addition, even claims that ultimately are unsuccessful could result in expenditures of funds in connection with litigation and divert management's time and other resources.

Failure to protect and ensure the confidentiality and security of data could lead to legal liability, adversely affect our reputation and have a material adverse effect on our operating results, business and reputation.

We may collect, store and use certain confidential information in the course of providing our services, and we have invested in preserving the security of this data. We may also outsource operations to third-party service providers to whom we transmit certain confidential data. There are no assurances that any security measures we have in place, or any additional security measures that our subcontractors may have in place, will be sufficient to protect this confidential information from unauthorized security breaches.

We cannot assure you that, despite the implementation of these security measures, we will not be subject to a security incident or other data breach or that this data will not be compromised. We may be required to expend significant capital and other resources to protect against security breaches or to alleviate problems caused by security breaches, or to pay penalties as a result of such breaches. Despite our implementation of security measures, techniques used to obtain unauthorized access or to sabotage systems change frequently and may not be recognized until launched against a target. As a result, we may be unable to anticipate these techniques or implement adequate preventative measures to protect this data. In addition, security breaches can also occur as a result of non-technical issues, including intentional or inadvertent breaches by our employees or service providers or by other persons or entities with whom we have commercial relationships. Any compromise or perceived compromise of our security could damage our reputation with our end-customers, and could subject us to significant liability, as well as regulatory action, including financial penalties, which would materially adversely affect our brand, results of operations, financial condition, business and prospects.

We have incurred, and expect to continue to incur, significant costs to protect against security breaches. We may incur significant additional costs in the future to address problems caused by any actual or perceived security breaches.

Breaches of our security measures or those of our third-party service providers, or other security incidents, could result in: unauthorized access to our sites, networks and systems; unauthorized access to, misuse or misappropriation of information, including personally identifiable information, or other confidential or proprietary information of ourselves or third parties; viruses, worms, spyware or other malware being served from our sites, networks or systems; deletion or modification of content or the display of unauthorized content on our sites; interruption, disruption or malfunction of operations; costs relating to notification of individuals, or other forms of breach remediation; deployment of additional personnel and protection technologies; response to governmental investigations and media inquiries and coverage; engagement of third-party experts and consultants; litigation, regulatory investigations, prosecutions, and other actions; and other potential liabilities. If any of these events occurs, or is believed to occur, our reputation and brand could be damaged, our business may suffer, we could be required to expend significant capital and other resources to alleviate problems caused by such actual or perceived breaches, we could be exposed to a risk of loss, litigation or regulatory action and possible liability, and our ability to operate our business, including our ability to provide maintenance and support services to our channel partners and end-customers, may be impaired. If current or prospective channel partners and end-customers believe that our systems and solutions do not provide adequate security for their businesses' needs, our business and our financial results could be harmed. Additionally, actual, potential or anticipated attacks may cause us to incur increasing costs, including costs to deploy additional personnel and protection technologies, train employees and engage third-party experts and consultants.

Although we maintain privacy, data breach and network security liability insurance, we cannot be certain that our coverage will be adequate for liabilities actually incurred or that insurance will continue to be available to us on economically reasonable terms, or at all. Any actual or perceived compromise or breach of our security measures, or those of our third-party service providers, or any unauthorized access to, misuse or misappropriation of personally identifiable information, channel partners' or end-customers information, or other information, could violate applicable laws and regulations, contractual obligations or other legal obligations and cause significant legal and financial exposure, adverse publicity and a loss of confidence in our security measures, any of which could have an material adverse effect on our business, financial condition and operating results.

Our failure to adequately protect personal data could have a material adverse effect on our business.

A wide variety of provincial, state, national, foreign, and international laws and regulations apply to the collection, use, retention, protection, disclosure, transfer, and other processing of personal data. These data protection and privacy-related laws and regulations are evolving and being tested in courts and may result in ever-increasing regulatory and public scrutiny and escalating levels of enforcement and sanctions. For example, the European Union's General Data Protection Regulation, or GDPR, which took effect in May 2018, has caused EU data protection requirements to be more stringent and provide for greater penalties. Because the GDPR may be subject to new or changing interpretations by courts, our interpretation of the law and efforts to comply with the rules and regulations of the law may be ruled invalid. Noncompliance with the GDPR can trigger fines of up to €20 million or 4% of global annual revenues, whichever is higher. The United Kingdom also recently enacted legislation that substantially implements the GDPR. Similarly, California recently enacted the California Consumer Privacy Act, or

CCPA, which, among other things, requires covered companies to provide new disclosures to California consumers and affords such consumers new rights to opt-out of certain sales of personal information. Aspects of the CCPA and its interpretation remain unclear. In addition, other states have enacted or proposed legislation that regulates the collection, use, and sale of personal information, and such regimes might not be compatible with either the GDPR or the CCPA or may require us to undertake additional practices. We cannot yet predict the impact of the CCPA or impending legislation on our business or operations, but it may require us to modify our data processing practices and policies and to incur substantial costs and expenses in an effort to comply. Our failure to comply with applicable laws and regulations, or to protect such data, could result in enforcement action against us, including significant fines, imprisonment of company officials and public censure, claims for damages by end-customers and other affected persons and entities, damage to our reputation and loss of goodwill (both in relation to existing and prospective channel partners and end-customers), and other forms of injunctive or operations-limiting relief, any of which could have a material adverse effect on our operations, financial performance, and business. Evolving and changing definitions of personal data and personal information, within the European Union, the United States, and elsewhere, especially relating to classification of Internet Protocol (''IP'') addresses, machine identification, location data, biometric data and other information, may limit or inhibit our ability to operate or expand our business, including limiting strategic partnerships that may involve the sharing of data. We may be required to expend significant resources to modify our solutions and otherwise adapt to these changes, which we may be unable to do on commercially reasonable terms or at all, and our ability to develop new solutions and features could be limited. These developments could harm our business, financial condition and results of operations. Even if not subject to legal challenge, the perception of privacy concerns, whether or not valid, may harm our reputation and inhibit adoption of our products by current and prospective end-customers.

If the general level of advanced cyberattacks declines, or is perceived by our current or potential customers to have declined, our business could be harmed.

Our security business may be dependent on enterprises and governments recognizing that advanced cyberattacks are pervasive and are not effectively prevented by legacy security solutions. High visibility attacks on prominent companies and governments have increased market awareness of advanced cyberattacks and help to provide an impetus for enterprises and governments to devote resources to protecting against advanced cyberattacks, which may include testing, purchasing and deploying our products. If advanced cyberattacks were to decline, or enterprises or governments perceived a decline in the general level of advanced cyberattacks, our ability to attract new channel partners and end-customers and expand our offerings within existing channel partners and end-customers could be materially and adversely affected. An actual or perceived reduction in the threat landscape could increase our sales cycles and harm our business, results of operations and financial condition.

Undetected software or hardware errors may harm our business and results of operations.

Our products may contain undetected errors or defects when first introduced or as new versions are released. We have experienced these errors or defects in the past in connection with new products and product upgrades. We expect that these errors or defects will be found from time to time in new or enhanced products after commencement of commercial distribution. These problems have in the past and may in the future cause us to incur significant warranty and repair costs, divert the attention of our engineering personnel from our product development efforts and cause significant customer relations problems. We may also be subject to liability claims for damages related to product errors or defects. While we carry insurance policies covering this type of liability, these policies may not provide sufficient protection should a claim be asserted. A material product liability claim may harm our business and results of operations.

Any errors, defects or vulnerabilities in our products could result in:

- expenditures of significant financial and product development resources in efforts to analyze, correct, eliminate or work around errors and defects or to address and eliminate vulnerabilities;
- loss of existing or potential end-customers or distribution channel partners;
- delayed or lost revenue;
- delay or failure to attain market acceptance;
- indemnification obligations under our agreements with resellers, distributors and/or end-customers;

- an increase in warranty claims compared with our historical experience or an increased cost of servicing warranty claims, either of which would adversely affect our gross margin; and
- litigation, regulatory inquiries, or investigations that may be costly and harm our reputation.

Our use of open source software in our products could negatively affect our ability to sell our products and subject us to possible litigation.

We incorporate open source software such as the Linux operating system kernel into our products. We have implemented a formal open source use policy, including written guidelines for use of open source software and business processes for approval of that use. We have developed and implemented our open source policies according to industry practice; however, best practices in this area are subject to change, because there is little reported case law on the interpretation of material terms of many open source licenses. We are in the process of reviewing our open source use and our compliance with open source licenses and implementing remediation and changes necessary to comply with the open source licenses related thereto. We cannot guarantee that our use of open source software has been, and will be, managed effectively for our intended business purposes and/or compliant with applicable open source licenses. We may face legal action by third parties seeking to enforce their intellectual property rights related to our use of such open source software. Failure to adequately manage open source license compliance and our use of open source software may result in unanticipated obligations regarding our products and services, such as a requirement that we license proprietary portions of our products or services on unfavorable terms, that we make available source code for modifications or derivative works we created based upon, incorporating or using open source software, that we license such modifications or derivative works under the terms of the particular open source license and/or that we redesign the affected products or services, which could result, for example, in a loss of intellectual property rights, or delay in providing our products and services. From time to time, there have been claims against companies that distribute or use third-party open source software in their products and services, asserting that the open source software or its combination with the products or services infringes third parties' patents or copyrights, or that the companies' distribution or use of the open source software does not comply with the terms of the applicable open source licenses. Use of certain open source software can lead to greater risks than use of warranted third-party commercial software, as open source licensors generally do not provide warranties or controls on the origin of such open source software. From time to time, there have been claims against companies that use open source software in their products, challenging the ownership of rights in such open source software. As a result, we could also be subject to suits by parties claiming ownership of rights in what we believe to be open source software and so challenging our right to use such software in our products. If any such claims were asserted against us, we could be required to incur significant legal expenses defending against such a claim. Further, if our defenses to such a claim were not successful, we could be, for example, subject to significant damages, be required to seek licenses from third parties in order to continue offering our products and services without infringing such third party's intellectual property rights, be required to re-engineer such products and services, or be required to discontinue making available such products and services if re-engineering cannot be accomplished on a timely or successful basis. The need to engage in these or other remedies could increase our costs or otherwise adversely affect our business, operating results and financial condition.

Our products must interoperate with operating systems, software applications and hardware that are developed by others and if we are unable to devote the necessary resources to ensure that our products interoperate with such software and hardware, we may fail to increase, or we may lose market share and we may experience a weakening demand for our products.

Our products must interoperate with our end-customers' existing infrastructure, specifically their networks, servers, software and operating systems, which may be manufactured by a wide variety of vendors and original equipment manufacturers. As a result, when problems occur in a network, it may be difficult to identify the source of the problem. The occurrence of software or hardware problems, whether caused by our products or another vendor's products, may result in the delay or loss of market acceptance of our products. In addition, when new or updated versions of our end-customers' software operating systems or applications are introduced, we must sometimes develop updated versions of our software so that our products will interoperate properly. We may not accomplish these development efforts quickly, cost-effectively or at all. These development efforts require capital investment and the devotion of engineering resources. If we fail to maintain compatibility with these applications, our end-customers may not be able to adequately utilize our products, and we may, among other consequences, fail to increase, or we may lose market share and experience a weakening in demand for our products, which would adversely affect our business, operating results and financial condition.

We license technology from third parties, and our inability to maintain those licenses could harm our business.

Many of our products include proprietary technologies licensed from third parties. In the future, it may be necessary to renew licenses for third party technology or obtain new licenses for other technology. These third-party licenses may not be available to us on acceptable terms, if at all. As a result, we could also face delays or be unable to make changes to our products until equivalent technology can be identified, licensed or developed and integrated with our products. Such delays or an inability to make changes to our products, if it were to occur, could adversely affect our business, operating results and financial condition. The inability to obtain certain licenses to third-party technology, or litigation regarding the interpretation or enforcement of license agreements and related intellectual property issues, could have a material adverse effect on our business, operating results and financial condition.

Failure to prevent excess inventories or inventory shortages could result in decreased revenue and gross margin and harm our business.

We purchase products from our manufacturers outside of, and in advance of, reseller or end-customer orders, which we hold in inventory and sell. We place orders with our manufacturers based on our forecasts of our end-customers' requirements and forecasts provided by our distribution channel partners. These forecasts are based on multiple assumptions, each of which might cause our estimates to be inaccurate, affecting our ability to provide products to our customers. There is a risk we may be unable to sell excess products ordered from our manufacturers. Inventory levels in excess of customer demand may result in obsolete inventory and inventory write-downs. The sale of excess inventory at discounted prices could impair our brand image and have an adverse effect on our financial condition and results of operations. Conversely, if we underestimate demand for our products or if our manufacturers fail to supply products we require at the time we need them, we may experience inventory shortages. Inventory shortages might delay shipments to resellers, distribution channel partners and customers and cause us to lose sales. These shortages may diminish the loyalty of our distribution channel partners or customers.

The difficulty in forecasting demand also makes it difficult to estimate our future financial condition and results of operations from period to period. A failure to accurately predict the level of demand for our products could adversely affect our total revenue and net income, and we are unlikely to forecast such effects with any certainty in advance.

Our sales cycles can be long and unpredictable, primarily due to the complexity of our end-customers' networks and data centers and the length of their budget cycles. As a result, our sales and revenue are difficult to predict and may vary substantially from period to period, which may cause our operating results to fluctuate significantly.

The timing of our sales is difficult to predict because of the length and unpredictability of our products' sales cycles. A sales cycle is the period between initial contact with a prospective end-customer and any sale of our products. Our sales cycle, in particular to our large end-customers, may be lengthy due to the complexity of their networks and data centers. Because of this complexity, prospective end-customers generally consider a number of factors over an extended period of time before committing to purchase our products. End-customers often view the purchase of our products as a significant and strategic decision that can have important implications on their existing networks and data centers and, as a result, require considerable time to evaluate, test and qualify our products prior to making a purchase decision and placing an order to ensure that our products will successfully interoperate with our end-customers' complex network and data centers. Additionally, the budgetary decisions at these entities can be lengthy and require multiple organization reviews. The length of time that end-customers devote to their evaluation of our products and decision-making process varies significantly. The length of our products' sales cycles typically ranges from three to 12 months but can be longer for our large end-customers. In addition, the length of our close or sales cycle can be affected by the extent to which customized features are requested, in particular in our large deals.

For all of these reasons, it is difficult to predict whether a sale will be completed or the particular fiscal period in which a sale will be completed, both of which contribute to the uncertainty of our future operating results. If our close or sales cycles lengthen, our revenue could be lower than expected, which would have an adverse impact on our operating results and could cause our stock price to decline.

Our ability to sell our products is highly dependent on the quality of our support and services offerings, and our failure to offer high-quality support could have a material adverse effect on our business, revenue and results of operations.

We believe that our ability to provide consistent, high quality customer service and technical support is a key factor in attracting and retaining end-customers of all sizes and is critical to the deployment of our products. When support is purchased our end-customers depend on our support organization to provide a broad range of support

services, including on-site technical support, 24-hour support and shipment of replacement parts on an expedited basis. If our support organization or our distribution channel partners do not assist our end-customers in deploying our products effectively, succeed in helping our end-customers resolve post-deployment issues quickly, or provide ongoing support, it could adversely affect our ability to sell our products to existing end-customers and could harm our reputation with potential end-customers. We currently have technical support centers in the United States, Japan, China, India and the Netherlands. As we continue to expand our operations internationally, our support organization will face additional challenges, including those associated with delivering support, training and documentation in languages other than English.

We typically sell our products with maintenance and support as part of the initial purchase, and a substantial portion of our support revenue comes from renewals of maintenance and support contracts. Our end-customers have no obligation to renew their maintenance and support contracts after the expiration of the initial period. If we are unable to provide high quality support, our end-customers may elect not to renew their maintenance and support contracts or to reduce the product quantity under their maintenance and support contracts, thereby reducing our future revenue from maintenance and support contracts.

Our failure or the failure of our distribution channel partners to maintain high-quality support and services could have a material and adverse effect on our business, revenue and operating results.

We depend on growth in markets relating to network security, management and analysis, and lack of growth or contraction in one or more of these markets could have a material adverse effect on our results of operations and financial condition.

Demand for our products is linked to, among other things, growth in the size and complexity of network infrastructures and the demand for networking technologies addressing the security, management and analysis of such infrastructures. These markets are dynamic and evolving. Our future financial performance will depend in large part on continued growth in the number of organizations investing in their network infrastructure and the amount they commit to such investments. If this demand declines, our results of operations and financial condition would be materially and adversely affected. Segments of the network infrastructure industry have in the past experienced significant economic downturns. Furthermore, the market for network infrastructure may not continue to grow at historic rates, or at all. The occurrence of any of these factors in the markets relating to network security, management and analysis could materially and adversely affect our results of operations and financial condition.

Because we recognize subscription revenue from our customers over the term of their agreements, downturns or upturns in sales of our subscription-based offerings will not be immediately reflected in our operating results and may adversely affect our revenue in the future.

We recognize subscription revenue over the term of our customer agreements. As a result, most of our subscription revenue arises from agreements entered into during previous periods. A shortfall in orders for our subscription-based solutions in any one period would most likely not significantly reduce our subscription revenue for that period, but could adversely affect the revenue contribution in future periods. In addition, we may be unable to quickly reduce our cost structure in response to a decrease in these orders. Accordingly, the effect of downturns in sales of our subscription-based solutions will not be fully reflected in our operating results until future periods. A subscription revenue model also makes it difficult for us to rapidly increase our revenue through additional subscription sales in any one period, as revenue is generally recognized over a longer period.

Our business and operations have experienced growth in certain prior periods and may experience rapid growth at certain times in the future, and if we do not effectively manage any future growth or are unable to improve our controls, systems and processes, our operating results will be adversely affected.

In certain prior periods, we have significantly increased the number of our employees and independent contractors. As we hire new employees and independent contractors and expand into new locations outside the United States, we are required to comply with varying local laws for each of these new locations. We anticipate that further expansion of our infrastructure and headcount will be required. Our growth has placed, and will continue to place, a significant strain on our administrative and operational infrastructure and financial resources. Our ability to manage our operations and growth across multiple countries will require us to continue to refine our operational, financial and management controls, human resource policies, and reporting systems and processes.

We need to continue to improve our internal systems, processes, and controls to effectively manage our operations and growth. We may not be able to successfully implement improvements to these systems, processes and

controls in an efficient or timely manner. In addition, our systems and processes may not prevent or detect all errors, omissions or fraud. For example, as described in our Annual Report on Form 10-K for our fiscal year ended December 31, 2018, we identified material weaknesses in our internal control over financial reporting and concluded that our internal control over financial reporting was not effective as of December 31, 2018 and December 31, 2017, and that our disclosure controls and procedures were not effective as of December 31, 2018 and December 31, 2017. We may experience difficulties in managing improvements to our systems, processes, and controls or in connection with third-party software, which could impair our ability to provide products or services to our customers in a timely manner, causing us to lose customers, limit us to smaller deployments of our products, increase our technical support costs, or damage our reputation and brand. Furthermore, given our growth and size, our management team may lack oversight on certain side agreements between sales personnel and customers. Our failure to improve our systems and processes, or their failure to operate in the intended manner, may result in our inability to manage the growth of our business and to accurately forecast our revenue, expenses, and earnings, or to prevent certain losses, any of which may harm our business and results of operations.

We may not be able to sustain or develop new distributor and reseller relationships, and a reduction or delay in sales to significant distribution channel partners could hurt our business.

We sell our products and services through multiple distribution channels in the United States and internationally. We may not be able to increase our number of distributor or reseller relationships or maintain our existing relationships. Recruiting and retaining qualified distribution channel partners and training them on our technologies requires significant time and resources. These distribution channel partners may also market, sell and support products and services that are competitive with ours and may devote more resources to the marketing, sales and support of such competitive products. Our sales channel structure could subject us to lawsuits, potential liability and reputational harm if, for example, any of our distribution channel partners misrepresent the functionality of our products or services to end-customers or violate laws or our corporate policies. If we are unable to establish or maintain our sales channels or if our distribution channel partners are unable to adapt to our future sales focus and needs, our business and results of operations will be harmed.

Our sales to governmental organizations are subject to a number of challenges and risks.

We sell to governmental organization end-customers. Sales to governmental organizations are subject to a number of challenges and risks. Selling to governmental organizations can be highly competitive, expensive and time consuming, often requiring significant upfront time and expense without any assurance that these efforts will generate a sale. We have not yet received security clearance from the United States government, which prevents us from being able to sell directly for certain governmental uses. There can be no assurance that such clearance will be obtained, and failure to do so may adversely affect our operating results. Governmental organization demand and payment for our products may be impacted by public sector budgetary cycles and funding authorizations, with funding reductions or delays adversely affecting public sector demand for our products. Governmental organizations may have statutory, contractual or other legal rights to terminate contracts with our distributors and resellers for convenience or due to a default, and any such termination may adversely impact our future operating results.

Failure to comply with governmental laws and regulations could harm our business.

Our business is subject to regulation by various federal, state, local and foreign governmental entities, including agencies responsible for monitoring and enforcing employment and labor laws, workplace safety, product safety, environmental laws, consumer protection laws, anti-bribery laws, import/export controls, federal securities laws, and tax laws and regulations. In certain jurisdictions, these regulatory requirements may be more stringent than those in the United States. Noncompliance with applicable regulations or requirements could subject us to investigations, sanctions, mandatory product recalls, enforcement actions, disgorgement of profits, fines, damages, civil and criminal penalties or injunctions. If any governmental sanctions are imposed, or if we do not prevail in any possible civil or criminal litigation, our business, operating results, and financial condition could be materially adversely affected. In addition, responding to any action will likely result in a significant diversion of management's attention and resources and an increase in professional fees. Enforcement actions and sanctions could harm our business, operating results and financial condition.

We are subject to governmental export and import controls that could subject us to liability or impair our ability to compete in international markets.

Our products are subject to U.S. export controls and may be exported outside the United States only with the required level of export license or through an export license exception because we incorporate encryption technology

into our products. In addition, various countries regulate the import of certain encryption technology and have enacted laws that could limit our ability to distribute our products or our end-customers' ability to implement our products in those countries. Changes in our products or changes in export and import regulations may create delays in the introduction of our products in international markets, prevent our end-customers with international operations from deploying our products throughout their global systems or, in some cases, prevent the export or import of our products to certain countries altogether. Any change in export or import regulations 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 decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential end-customers with international operations. Any decreased use of our products or limitation on our ability to export or sell our products would likely adversely affect our business, operating results and financial condition.

We discovered that trial software was inadvertently available for download by any international user and, on limited occasions, was downloaded by individuals located in a U.S. sanctioned country. We implemented corrective actions and filed a Voluntary Self Disclosure in February 2017 with the U.S. Department of Commerce and U.S. Department of Treasury regarding these technical violations. Both agencies closed their review without any fines or penalties.

We are subject to various environmental laws and regulations that could impose substantial costs upon us.

Our company must comply with local, state, federal, and international environmental laws and regulations in the countries in which we do business. We are also subject to laws, which restrict certain hazardous substances, including lead, used in the construction of our products, such as the European Union Restriction on the Use of Hazardous Substances in electrical and electronic equipment directive. We are also subject to the European Union Directive, known as the Waste Electrical and Electronic Equipment Directive (''WEEE Directive''), which requires producers of certain electrical and electronic equipment to properly label products, register as a WEEE producer, and provide for the collection, disposal and recycling of waste electronic products. Failure to comply with these environmental directives and other environmental laws could result in the imposition of fines and penalties, inability to sell covered products in certain countries, the loss of revenue, or subject us to third-party property damage or personal injury claims, or require us to incur investigation, remediation or engineering costs. Our operations and products will be affected by future environmental laws and regulations, but we cannot predict the ultimate impact of any such future laws and regulations at this time.

Our products must conform to industry standards in order to be accepted by end-customers in our markets.

Generally, our products comprise only a part of a data center. The servers, network, software and other components and systems of a data center must comply with established industry standards in order to interoperate and function efficiently together. We depend on companies that provide other components of the servers and systems in a data center to support prevailing industry standards. Often, these companies are significantly larger and more influential in driving industry standards than we are. Some industry standards may not be widely adopted or implemented uniformly, and competing standards may emerge that may be preferred by our end-customers. If larger companies do not support the same industry standards that we do, or if competing standards emerge, market acceptance of our products could be adversely affected and we may need to incur substantial costs to conform our products to such standards, which could harm our business, operating results and financial condition.

We are dependent on various information technology systems, and failures of or interruptions to those systems could harm our business.

Many of our business processes depend upon our information technology systems, the systems and processes of third parties, and on interfaces with the systems of third parties. If those systems fail or are interrupted, or if our ability to connect to or interact with one or more networks is interrupted, our processes may function at a diminished level or not at all. This could harm our ability to ship or support our products, and our financial results may be harmed.

In addition, reconfiguring or upgrading our information technology systems or other business processes in response to changing business needs may be time-consuming and costly and is subject to risks of delay or failed deployment. To the extent this impacts our ability to react timely to specific market or business opportunities, our financial results may be harmed.

Future acquisitions we may undertake may not result in the financial and strategic goals that are contemplated at the time of the transaction.

We completed the acquisition of substantially all of the assets of Appcito in June 2016 and may make future acquisitions of complementary companies, products or technologies. With respect to any acquisitions we may undertake, we may find that the acquired businesses, products or technologies do not further our business strategy as expected, that we paid more than what the assets are later worth or that economic conditions change, all of which may generate future impairment charges. Acquisitions may be viewed negatively by customers, financial markets or investors. There may be difficulty integrating the operations and personnel of an acquired business, and we may have difficulty retaining the key personnel of an acquired business. We may also have difficulty in integrating acquired technologies or products with our existing product lines. Any integration process may require significant time and resources, and we may not be able to manage the process successfully. Our ongoing business and management's attention may be disrupted or diverted by transition or integration issues and the complexity of managing geographically and culturally diverse locations. We may have difficulty maintaining uniform standards, controls, procedures and policies across locations. We may experience significant problems or liabilities associated with product quality, technology and other matters.

Our inability to successfully operate and integrate future acquisitions appropriately, effectively and in a timely manner, or to retain key personnel of any acquired business, could have a material adverse effect on our revenue, gross margin and expenses.

Our ability to use our net operating loss carryforwards may be subject to limitation and may result in increased future tax liability to us.

Generally, a change of more than 50% in the ownership of a corporation's stock, by value, over a three-year period constitutes an ownership change for U.S. federal income tax purposes. An ownership change may limit a company's ability to use its net operating loss carryforwards attributable to the period prior to such change. In the event we have undergone an ownership change under Section 382 of the Internal Revenue Code, if we earn net taxable income, our ability to use our pre-change net operating loss carryforwards to offset U.S. federal taxable income may become subject to limitations, which could potentially result in increased future tax liability to us.

Changes in tax laws or regulations or adverse outcomes resulting from examination of our income or other tax returns could adversely affect our operating results and financial condition.

We are subject to income taxes in the United States and various foreign jurisdictions, and our domestic and international tax liabilities will be subject to the allocation of expenses in differing jurisdictions. Our future effective tax rates could be subject to volatility or adversely affected by a number of factors, including:

- changes in the valuation of our deferred tax assets and liabilities;
- expected timing and amount of the release of tax valuation allowances;
- expiration of, or detrimental changes in, research and development tax credit laws;
- tax effects of stock-based compensation;
- costs related to intercompany restructurings;
- changes in tax laws, regulations, accounting principles or interpretations thereof;
- future earnings being lower than anticipated in countries where we have lower statutory tax rates and higher than anticipated earnings in countries where we have higher statutory tax rates; or
- examinations by US federal, state or foreign jurisdictions that disagree with interpretations of tax rules and regulations in regard to positions taken on tax filings.

As our business grows, we are required to comply with increasingly complex taxation rules and practices. We are subject to tax in multiple U.S. tax jurisdictions and in foreign tax jurisdictions as we expand internationally. The development of our tax strategies requires additional expertise and may impact how we conduct our business. Our future effective tax rates could be unfavorably affected by changes in, or interpretations of, tax rules and regulations in the jurisdictions in which we do business or changes in the valuation of our deferred tax assets and liabilities. Furthermore, we provide for certain tax liabilities that involve significant judgment. We are subject to the

examination of our tax returns by federal, state and foreign tax authorities, which could focus on our intercompany transfer pricing methodology as well as other matters. If our tax strategies are ineffective or we are not in compliance with domestic and international tax laws, our financial position, operating results and cash flows could be adversely affected.

In addition, from time to time the United States, foreign and state governments make substantive changes to tax rules and the application of rules to companies. For example, on June 7, 2019, the U.S. Court of Appeals for the Ninth Circuit issued an opinion in Altera Corp. v. Commissioner upholding the U.S. Treasury Department's regulations requiring related parties in an intercompany cost-sharing arrangement to share expenses related to share-based compensation in proportion to the economic activity of the related parties. This opinion reversed the prior decision of the U.S. Tax Court. Since the Ninth Circuit ruling is potentially subject to further judicial review, we will continue to monitor developments and potential impacts to our consolidated financial statements. Furthermore, due to shifting economic and political conditions, tax policies or rates in various jurisdictions may be subject to significant change.

We are exposed to the credit risk of our distribution channel partners and end-customers, which could result in material losses and negatively impact our operating results.

Most of our sales are on an open credit basis, with typical payment terms ranging from 30 to 90 days depending on local customs or conditions that exist in the sale location. If any of the distribution channel partners or end-customers responsible for a significant portion of our revenue becomes insolvent or suffers a deterioration in its financial or business condition and is unable to pay for our products, our results of operations could be harmed.

The sales price of our products and subscriptions may decrease, which may reduce our gross profits and adversely impact our financial results.

The sales prices for our products and subscriptions may decline for a variety of reasons, including competitive pricing pressures, discounts, a change in our mix of products and subscriptions, anticipation of the introduction of new products or subscriptions, or promotional programs. Competition continues to increase in the market segments in which we participate, and we expect competition to further increase in the future, thereby leading to increased pricing pressures. Larger competitors with more diverse product and service offerings may reduce the price of products or subscriptions that compete with ours or may bundle them with other products and subscriptions. Additionally, although we price our products and subscriptions worldwide in U.S. dollars (except in Japan), currency fluctuations in certain countries and regions may negatively impact actual prices that channel partners and end-customers are willing to pay in those countries and regions. Furthermore, we anticipate that the sales prices and gross profits for our products will decrease over product life cycles. We cannot guarantee that we will be successful in developing and introducing new offerings with enhanced functionality on a timely basis, or that our product and subscription offerings, if introduced, will enable us to maintain our prices and gross profits at levels that will allow us to achieve and maintain profitability.

Our reported financial results may be adversely affected by changes in accounting principles generally accepted in the United States.

Generally accepted accounting principles (''GAAP'') in the United States are subject to interpretation by the Financial Accounting Standards Board (''FASB''), the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. A change in these principles or interpretations could have a significant effect on our reported financial results, and could affect the reporting of transactions completed before the announcement of a change. For example, in May 2014, the FASB issued Accounting Standards Update No. 2014-09 (Topic 606), Revenue from Contracts with Customers, which supersedes nearly all existing revenue recognition guidance under U.S. GAAP. We adopted Topic 606 effective January 1, 2018, applying the modified retrospective method to all contracts that were not completed as of January 1, 2018. This or other changes in accounting principles could adversely affect our financial results, including the comparability of our results. See Note 1 of our Notes to the Consolidated Financial Statements included in Part II, Item 8 of this report regarding the effect of new accounting pronouncements on our financial statements. Any difficulties in implementing these pronouncements could cause us to fail to meet our financial reporting obligations, which could result in regulatory discipline and harm investors' confidence in us.

Concentration of ownership among our existing executive officers, a small number of stockholders, directors and their affiliates may prevent new investors from influencing significant corporate decisions.

As of December 31, 2019, our executive officers and directors, together with affiliated entities, owned 36% of our then outstanding common stock (43% if other holders of 5% or more of our outstanding common stock are also

included). Accordingly, these stockholders, acting together, have significant influence over the election of our directors, over whether matters requiring stockholder approval are approved or disapproved and over our affairs in general. The interests of these stockholders could conflict with your interests. These stockholders may also have an interest in pursuing acquisitions, divestitures, financings or other transactions that, in their judgment, could enhance their investments, even though such transactions might involve risks to you. In addition, this concentration of ownership could have the effect of delaying or preventing a liquidity event such as a merger or liquidation of our company.

Certain stockholders could attempt to influence changes at the Company, which could adversely affect our operations, financial condition and the value of our common stock.

Our stockholders may from time-to-time seek to acquire a controlling stake in us, engage in proxy solicitations, advance stockholder proposals or otherwise attempt to effect changes. Campaigns by stockholders to effect changes at publicly-traded companies are sometimes led by investors seeking to increase short-term stockholder value through actions such as financial restructuring, increased debt, special dividends, stock repurchases or sales of assets or the entire company. Responding to proxy contests and other actions by activist stockholders can be costly and time-consuming, and could disrupt our operations and divert the attention of our Board of Directors and senior management from the pursuit of our business strategies. These actions could adversely affect our operations, financial condition and the value of our common stock.

We may need to raise additional funds in future private or public offerings, and such funds may not be available on acceptable terms, if at all. If we do raise additional funds, existing stockholders will suffer dilution.

We may need to raise additional funds in private or public offerings, and these funds may not be available to us when we need them or on acceptable terms, if at all. If we raise additional funds through further issuances of equity or convertible debt securities, you could suffer significant dilution, and any new equity securities we issue could have rights, preferences and privileges superior to those of our then-existing capital stock. Any debt financing secured by us in the future could involve restrictive covenants relating to our capital raising activities and other financial and operational matters, that may make it more difficult for us to obtain additional capital and to pursue business opportunities. If we cannot raise additional funds when we need them, our business and prospects could fail or be materially and adversely affected.

The price of our common stock has been and may continue to be volatile, and the value of your investment could decline.

Technology stocks have historically experienced high levels of volatility. The trading price of our common stock has been and is likely to continue to be volatile and subject to fluctuations in response to many factors, some of which are beyond our control and may not be related to our operating performance. These fluctuations could cause you to lose all or part of your investment in our common stock. Factors that could cause fluctuations in the trading price of our common stock include the following:

- announcements of new products, services or technologies, commercial relationships, acquisitions or other events by us or our competitors;
- price and volume fluctuations in the overall stock market from time to time;
- significant volatility in the market price and trading volume of technology companies in general and of companies in our industry;
- fluctuations in the trading volume of our shares or the size of our public float;
- actual or anticipated changes or fluctuations in our results of operations;
- whether our results of operations meet the expectations of securities analysts or investors;
- actual or anticipated changes in the expectations of investors or securities analysts;
- litigation or investigations involving us, our industry, or both;
- regulatory developments in the United States, foreign countries or both;
- general economic conditions and trends;

- major catastrophic events;
- sales of large blocks of our common stock; or
- departures of key personnel.

In addition, if the market for technology stocks or the stock market in general experiences a loss of investor confidence, the trading price of our common stock could decline for reasons unrelated to our business, results of operations or financial condition. The trading price of our common stock might also decline in reaction to events that affect other companies in our industry even if these events do not directly affect us. In the past, following periods of volatility in the market price of a company's securities, securities class action litigation has often been brought against that company. The price of our common stock has been highly volatile since our initial public offering in March 2014. In January 2015, several substantially identical putative class action lawsuits alleging violations of securities laws were filed against us, our directors and certain of our executive officers and in June 2015, a related shareholder derivative action was filed. The consolidated securities class actions and the derivative action were settled in 2016 and dismissed in the first quarter of 2017. In March 2018, a putative class action lawsuit alleging violations of securities laws was filed against us and certain of our current and former executive officers, and in May 2018, a related shareholder derivative action was filed. In March 2018, the United States Securities and Exchange Commission began a private investigation into any securities laws violations by us or persons currently or formerly affiliated with us. Current or future securities litigation, including any related shareholder derivative litigation or investigation, could result in substantial costs and divert our management's attention and resources from our business. This could have a material adverse effect on our business, results of operations and financial condition.

Sales of a substantial amount of our common stock in the public markets, or the perception that such sales might occur, could reduce the price that our common stock might otherwise attain and may dilute your voting power and your ownership interest in us.

Sales of a substantial number of shares of our common stock in the public market, or the perception that such sales could occur, could adversely affect the market price of our common stock and may make it more difficult for you to sell your common stock at a time and price that you deem appropriate. As of December 31, 2019, there were approximately 3.4 million vested and exercisable options to purchase our common stock, in addition to the 77.6 million common shares outstanding as of such date. All outstanding shares and all shares issuable upon exercise of outstanding and vested options are freely tradable, subject in some cases to volume and other restrictions of Rules 144 and 701 under the Securities Act, as well as our insider trading policy. In addition, holders of certain shares of our outstanding common stock, including an aggregate of 9.5 million shares held by funds affiliated with Summit Partners, L.P. as of December 31, 2019 are entitled to rights with respect to registration of these shares under the Securities Act pursuant to an investors' rights agreement.

If these holders of our common stock, by exercising their registration rights, sell a large number of shares, they could adversely affect the market price for our common stock. If we file a registration statement for the purposes of selling additional shares to raise capital and are required to include shares held by these holders pursuant to the exercise of their registration rights, our ability to raise capital may be impaired. Sales of substantial amounts of our common stock in the public market, or the perception that these sales could occur, could cause the market price of our common stock to decline.

We are obligated to implement and maintain effective internal control over financial reporting. As previously reported, we concluded that our internal control over financial reporting was not effective as of December 31, 2018 and December 31, 2017. In the future, we may again not complete our analysis of our internal control over financial reporting in a timely manner, or our internal control over financial reporting may not be determined to be effective, or we may discover significant deficiencies or material weaknesses in our internal control over financial reporting, all of which may adversely affect investor confidence in our company and, as a result, the value of our common stock.

While we were able to determine in our management's report for our fiscal year ended December 31, 2019 that our internal control over financial reporting is effective, as well as provide an unqualified attestation report from our independent registered public accounting firm to that effect, we may not be able to complete our evaluation, testing, and any required remediation in a timely fashion, may be unable to assert that our internal controls are effective, or our independent registered public accounting firm may not be able to formally attest to the effectiveness of our internal control over financial reporting in the future.

Previous significant deficiencies and material weaknesses resulted in a restatement of certain of our financial reports, as disclosed in our Annual Report on Form 10-K for our fiscal year ended December 31, 2018. If, in any future reporting periods, we are unable to conclude that our internal control over financial reporting is effective, or if we are required to restate our financial statements as a result of ineffective internal control over financial reporting, we could lose investor confidence in the accuracy and completeness of our financial reports, which would cause the price of our common stock to decline.

If securities or industry analysts do not publish research or reports about our business, or publish inaccurate or unfavorable research reports about our business, our share price and trading volume could decline.

The market for our common stock, to some extent, depends on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. For example, in October 2019, an analyst ceased to cover us, leaving us with one analyst who covers us. If our sole remaining analyst should downgrade our shares or change their opinion of our shares, our share price would likely decline. If that analyst should cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which would cause our share price or trading volume to decline.

Our charter documents and Delaware law could discourage takeover attempts and lead to management entrenchment.

Our restated certificate of incorporation and bylaws contain provisions that could delay or prevent a change in control of our company. These provisions could also make it difficult for stockholders to elect directors that are not nominated by the current members of our Board of Directors or take other corporate actions, including effecting changes in our management. These provisions include:

- the ability of our Board of Directors to issue shares of preferred stock and to determine the price and other terms of those shares, including preference and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- the exclusive right of our Board of Directors to elect a director to fill a vacancy created by the expansion of our Board of Directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our Board of Directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of our Board of Directors, our Chief Executive Officer, our secretary, or a majority vote of our Board of Directors, which could delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors;
- the ability of our Board of Directors, by majority vote, to amend the bylaws, which may allow our Board of Directors to take additional actions to prevent an unsolicited takeover and inhibit the ability of an acquirer to amend the bylaws to facilitate an unsolicited takeover attempt; and
- advance notice procedures with which stockholders must comply to nominate candidates to our Board of Directors or not to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

In addition, as a Delaware corporation, we are subject to Section 203 of the Delaware General Corporation Law. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a certain period of time.

Our bylaws designate the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Our bylaws provide that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to

us or our stockholders, any action arising pursuant to any provision of the Delaware General Corporate Law (''DGCL''), our certificate of incorporation or our bylaws, or any action asserting a claim that is governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein and the claim not being one which is vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery or for which the Court of Chancery does not have subject matter jurisdiction. This exclusive forum provision does not apply to suits brought to enforce a duty or liability created by the Securities Exchange Act of 1934. It could apply, however, to a suit that falls within one or more of the categories enumerated in the exclusive forum provision and asserts claims under the Securities Act of 1933, as amended, or the Securities Act, inasmuch as Section 22 of the Securities Act, creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. There is uncertainty as to whether a court would enforce this provision with respect to claims under the Securities Act, and our stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder.

This choice of forum provision may limit our stockholders' ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, employees or agents, which may discourage such lawsuits against us and our directors, officers, employees and agents even though an action, if successful, might benefit our stockholders. Stockholders who do bring a claim in the Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near Delaware. The Court of Chancery may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. Alternatively, if a court were to find this provision of our bylaws inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could have a material adverse effect on our business, financial condition or results of operations.

Our business is subject to the risks of earthquakes, fire, power outages, floods, and other catastrophic events, and to interruption by man-made problems such as acts of war and terrorism.

A significant natural disaster, such as an earthquake, fire, a flood, or significant power outage could have a material adverse impact on our business, operating results, and financial condition. Our corporate headquarters are located in the San Francisco Bay Area, a region known for seismic activity. In addition, our two primary manufacturers are located in Taiwan, which is near major earthquake fault lines and subject to typhoons during certain times of the year. In the event of a major earthquake or typhoon, or other natural or man-made disaster, our manufacturers in Taiwan may face business interruptions, which may impact quality assurance, product costs, and product supply and timing. In the event our or our service providers' information technology systems or manufacturing or logistics abilities are hindered by any of the events discussed above, shipments could be delayed, resulting in missed financial targets, such as revenue and shipment targets, and our operations could be disrupted, for the affected quarter or quarters. In addition, cyber security attacks, acts of war or terrorism, or other geo-political unrest could cause disruptions in our business or the business of our supply chain, manufacturers, logistics providers, partners, or end-customers or the economy as a whole. Any disruption in the business of our supply chain, manufacturers, logistics providers, partners or end-customers that impacts sales at the end of a quarter could have a significant adverse impact on our quarterly results. All of the aforementioned risks may be further increased if the disaster recovery plans for us and our suppliers prove to be inadequate. To the extent that any of the above should result in delays or cancellations of customer orders, or the delay in the manufacture, deployment or shipment of our products, our business, financial condition and operating results would be adversely affected.

We do not intend to pay dividends for the foreseeable future.

We intend to retain any earnings to finance the operation and expansion of our business, and we do not anticipate paying any cash dividends in the future. In addition, the 2016 Credit Facility, which expired November 1, 2019, as well as any future financing arrangements we may enter into will restrict our ability to pay cash dividends while such financing arrangements remains outstanding. As a result, you may only receive a return on your investment in our common stock if the value of our common stock increases.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters is located in San Jose, California, where we currently lease 116,381 square feet of space under a lease agreement that expires on July 31, 2027. We also lease space for offices internationally and for sales offices in locations throughout the United States and various international locations, including, among others, China, Japan, the United Kingdom, the Netherlands, Taiwan, Korea, Singapore and India. We believe that our current facilities are adequate to meet our current needs. We intend to expand our facilities or add new facilities as we add employees and enter new geographic markets. We believe that alternative or additional space suitable for our requirements will be available as needed to accommodate ongoing operations and any such growth. We do however expect to incur additional expenses in connection with any such new or expanded facilities.

Item 3. Legal Proceedings

We have been and may currently be involved in various legal proceedings, the outcomes of which are not within our complete control or may not be known for prolonged periods of time. Management is required to assess the probability of loss and amount of such loss, if any, in preparing our consolidated financial statements. We evaluate the likelihood of a potential loss from legal proceedings to which we are a party. We record a liability for such claims when a loss is deemed probable and the amount can be reasonably estimated. Significant judgment may be required in the determination of both probability and whether an exposure is reasonably estimable. Our judgments are subjective based on the status of the legal proceedings, the merits of our defenses and consultation with in-house and outside legal counsel. As additional information becomes available, we reassess the potential liability related to pending claims and may revise our estimates. Due to the inherent uncertainties of the legal processes in the multiple jurisdictions in which we operate, our judgments may be materially different than the actual outcomes, which could have material adverse effects on our business, financial conditions and results of operations.

Additional information with respect to this Item may be found in Note 8 Commitments and Contingencies, in the notes to consolidated financial statements in Part II, Item 8 of this Annual Report on Form 10-K, which is incorporated by reference.

Item 4. Mine Safety Disclosure

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market for Registrant's Common Equity

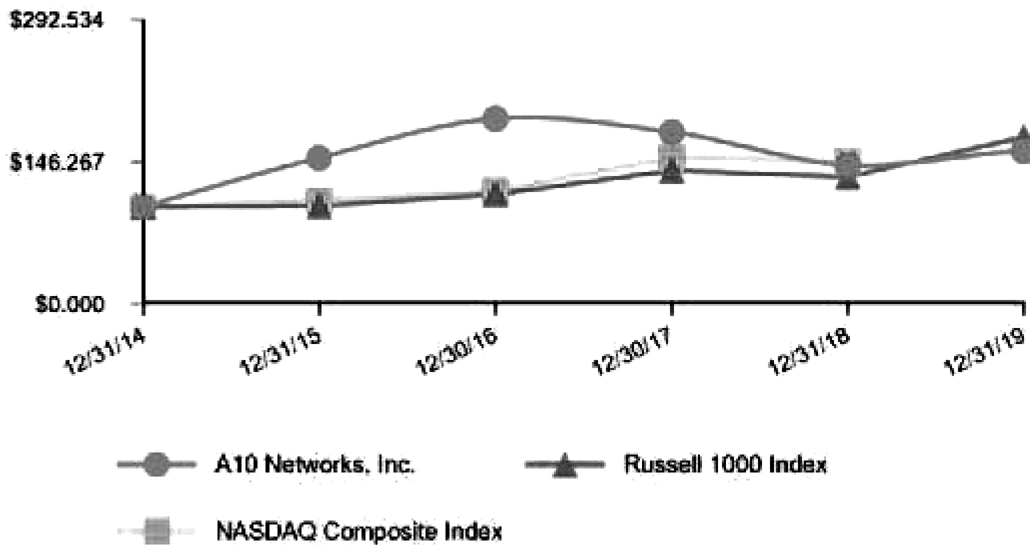
Our common stock has been quoted on the New York Stock Exchange (''NYSE'') under the symbol ''ATEN.''

There were approximately 116 stockholders of record on February 28, 2020. Because many shares of our common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these holders of record.

Company Stock Performance

The following graph compares the cumulative total return on our common stock, the NASDAQ Composite Index and the Russell 1000 Index. The graph assumes $100 was invested on January 1, 2015 in our common stock and each index and all dividends were reinvested. The historic stock price performance is not necessarily indicative of future stock price performance.

Comparison of Cumulative Total Return Among A10 Networks, Inc., NASDAQ Composite and Russell 1000 Index



Issuer Purchases of Equity Securities

None.

Unregistered Sales of Equity Securities

None.

Item 6. Selected Financial Data

We have derived the consolidated statement of operations data for the years ended December 31, 2019, 2018 and 2017 and the selected consolidated balance sheet data as of December 31, 2019 and 2018 from our audited consolidated financial statements that are included in this Form 10-K. The following selected consolidated statement of operations data for the years ended December 31, 2016 and 2015 and the selected consolidated balance sheet data as of December 31, 2017, 2016 and 2015 are derived from our audited consolidated financial statements that are not included in this report.

Our historical operating results are not necessarily indicative of future operating results, these selected consolidated financial data should be read in conjunction with the consolidated financial statements and accompanying notes in Part II, Item 8, and Management's Discussion and Analysis of Financial Condition and Results of Operations in Part II, Item 7 included in this report.

The amounts as of and for the years ended December 31, 2019 and 2018 have been prepared based on our adoption of Accounting Standards Codification (''ASC'') No. 606, *Contracts with Customers*. We elected to adopt this accounting standard on a modified retrospective basis which resulted in the impact of adoption being recorded as of January 1, 2018. The amounts in all other years, other than 2019 and 2018, in the tables below have been prepared on the previously outstanding guidance on revenue recognition. We have disclosed the ASC 606 adoption impact on our revenue recognition in Note 2 of the audited consolidated financial statements included in Part II, Item 8 of this report.

The amounts as of and for the year ended December 31, 2019 have been prepared based on our adoption of Accounting Standards Codification (''ASC'') No. 842, *Leases*. We adopted this accounting standard on a modified retrospective basis which resulted in the impact of adoption being recorded as of January 1, 2019. The amounts in all other years, other than 2019, in the tables below have been prepared on the previously outstanding guidance on leases. We have disclosed the ASC 842 adoption impact on our right-of-use assets and lease liabilities in Note 5 of the audited consolidated financial statements included in Part II, Item 8 of this report.

	Years Ended December 31,				
(in thousands, except per share amounts)	2019	2018	2017	2016	2015
Consolidated Statement of Operations Data:					
Revenue	$212,628	$232,223	$235,429	$227,297	$196,285
Cost of revenue	$ 48,881	$ 51,896	$ 53,318	$ 54,413	$ 48,402
Gross profit	$163,747	$180,327	$182,111	$172,884	$147,883
Loss from operations	$ (17,094)	$ (27,679)	$ (10,372)	$ (20,570)	$ (40,309)
Net loss	$ (17,819)	$ (27,617)	$ (10,751)	$ (22,391)	$ (41,897)
Net loss per share: basic and diluted	$ (0.23)	$ (0.38)	$ (0.15)	$ (0.34)	$ (0.67)
Weighted-average shares used in computing net loss per share: basic and diluted	76,080	72,882	70,053	65,701	62,428
Consolidated Balance Sheet Data:					
Cash, cash equivalents and marketable securities	$129,922	$128,375	$131,134	$114,347	$ 98,117
Working capital	$123,358	$117,572	$111,076	$ 95,285	$ 89,550
Total assets	$274,053	$235,876	$224,858	$216,733	$189,892
Deferred revenue (current and non-current)	$101,164	$ 97,966	$ 94,637	$ 91,617	$ 72,008
Total stockholders' equity	$108,787	$103,883	$ 98,386	$ 82,752	$ 78,205

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion and analysis of our financial condition and results of operations ("MD&A") should be read in conjunction with our consolidated financial statements and related notes included elsewhere in this document. In addition to historical information, the MD&A contains forward-looking statements that involve risks and uncertainties. These forward-looking statements include, but are not limited to, those matters discussed under the heading "Forward-looking Statements." Our actual results could differ materially from those anticipated by these forward-looking statements due to various factors, including, but not limited to, those set forth under Item 1A. Risk Factors of this Form 10-K and elsewhere in this document.

Overview

We are a leading provider of secure application solutions and services that enable a new generation of intelligently connected companies with the ability to continuously improve cyber protection and digital responsiveness across dynamic Information Technology (''IT'') and network infrastructures. Our portfolio of software and hardware solutions combines industry-leading performance and scale with advanced intelligent automation, machine learning, data driven analytics, and threat intelligence to ensure security and availability of customer applications across their multi-cloud and mobile infrastructure networks, including on-premise, private and public clouds. As the cyber threat landscape intensifies and network architectures evolve, we are committed to providing customers with greater connected intelligence to improve the security, visibility, automation, availability, flexibility, management and performance of their applications. Our customers include leading cloud providers, web-scale businesses, service providers, government organizations and enterprises.

Our product portfolio seeks to address many of the aforementioned challenges and solution requirements. The portfolio consists of six secure application solutions; Thunder Application Delivery Controller (''ADC''), Lightning Application Delivery Controller (''Lightning ADC''), Thunder Carrier Grade Networking (''CGN''), Thunder Threat Protection System (''TPS''), Thunder SSL Insight (''SSLi'') and Thunder Convergent Firewall (''CFW'') and intelligent management, and automation tools; Harmony Controller and aGalaxy TPS. Our products are offered in a variety of form factors and payment models, including physical appliances and perpetual and subscription based software licenses, as well as pay-as-you-go licensing models and FlexPool, a flexible consumption-based software model.

We derive revenue from sales of products and related support services. Products revenue is generated primarily by sales of hardware appliances with perpetual licenses to our embedded software solutions. We also derive revenue from licenses to, or subscription services for, software-only versions of our solutions. We generate services revenue primarily from sales of maintenance and support contracts. Our customers predominantly purchase maintenance and support in conjunction with purchases of our products. In addition, we also derive revenue from the sale of professional services.

We sell our products globally to service providers and enterprises that depend on data center applications and networks to generate revenue and manage operations efficiently. In 2019, we changed the way we present revenue by customer vertical. We now report two customer verticals: service providers and enterprises, compared to service providers, enterprises and web giants in prior years. Our previously reported revenue from web giants is primarily accounted for now in enterprise revenue. Additionally, we changed the way we present customer revenue by geographic region. We now report customer revenues in four geographic regions: the Americas, Japan, Asia Pacific (excluding Japan) and EMEA. Our previously reported customer revenues of our United States and Latin America regions are now included in the Americas geographic region. We believe this new geographic and vertical view aligns with how we manage the business and maps our product portfolio to customer verticals. The revenue by vertical percentages from prior years included in this report have been revised to conform with current year presentation.

Our end-customers operate in a variety of industries, including telecommunications, technology, industrial, retail, financial, gaming, education and government. Since inception, our customer base has grown rapidly. As of December 31, 2019, we had sold products to approximately 6,020 end customers across 133 countries.

We sell substantially all of our solutions through our high-touch sales organization as well as distribution channel partners, including distributors, value-added resellers and system integrators, and fulfill nearly all orders globally through such partners. We believe this sales approach allows us to obtain the benefits of channel distribution, such as expanding our market coverage, while still maintaining face-to-face relationships with our end-customers.

We outsource the manufacturing of our hardware products to original design manufacturers. We perform quality assurance and testing at our San Jose, Taiwan and Japan distribution centers, as well as at our manufacturers' locations.

During 2019, 42% of our total revenue was generated from the Americas, 28% from Japan and 30% from other geographical regions. During 2018, 48% of our total revenue was generated from the Americas, 24% from Japan and 28% from other geographical regions. During 2017, 52% of our total revenue was generated from the Americas, 22% from Japan and 26% from other geographical regions. Our enterprise customers accounted for 42%, 43% and 44% of our total revenue during 2019, 2018 and 2017, respectively. Our service provider customers accounted for 58%, 57% and 56% of our total revenue during 2019, 2018 and 2017, respectively.

As a result of the nature of our target market and the current stage of our development, a substantial portion of our revenue comes from a limited number of large customers and service providers and web giants, in any period. Purchases from our ten largest end-customers accounted for 36%, 37% and 35% of our total revenue for 2019, 2018 and 2017, respectively. Sales to these large end-customers have typically been characterized by large but irregular purchases with long sales cycles. The timing of these purchases and the delivery of the purchased products are difficult to predict. Consequently, any acceleration or delay in anticipated product purchases by or deliveries to our largest customers could materially impact our revenue and operating results in any quarterly period. This may cause our quarterly revenue and operating results to fluctuate from quarter to quarter and make them difficult to predict.

As of December 31, 2019, we had $45.7 million of cash and cash equivalents and $84.2 million of marketable securities. Cash used in operating activities was $0.4 million in 2019 compared to $2.7 million of cash used in operating activities in 2018.

We intend to continue to invest for long-term growth. We have invested and expect to continue to invest in our product development efforts to deliver new products and additional features in our current products to address customer needs. In addition, we may expand our global sales and marketing organizations, expand our distribution channel partner programs and increase awareness of our solutions on a global basis. Our investments in growth in these areas may affect our short-term profitability.

Results of Operations

A summary of our consolidated statements of operations for the year ended December 31, 2019, 2018 and 2017 are as follows (dollars in thousands):

	Years Ended December 31,				Increase (Decrease)	
	2019		2018			
	Amount	Percent of Total Revenue	Amount	Percent of Total Revenue	Amount	Percent
Revenue:						
Products	$121,920	57.3%	$144,682	62.3%	$(22,762)	(15.7)%
Services	90,708	42.7	87,541	37.7	3,167	3.6%
Total revenue	212,628	100.0	232,223	100.0	(19,595)	(8.4)%
Cost of revenue:						
Products	29,816	14.0	34,066	14.7	(4,250)	(12.5)%
Services	19,065	9.0	17,830	7.6	1,235	6.9%
Total cost of revenue	48,881	23.0	51,896	22.3	(3,015)	(5.8)%
Gross profit	163,747	77.0	180,327	77.7	(16,580)	(9.2)%
Operating expenses:						
Sales and marketing	92,783	43.6	103,214	44.4	(10,431)	(10.1)%
Research and development	61,824	29.1	65,157	28.1	(3,333)	(5.1)%
General and administrative	23,704	11.1	39,635	17.1	(15,931)	(40.2)%
Restructuring expense	2,530	1.2	—	—	2,530	*
Total operating expenses	180,841	85.0	208,006	89.6	(27,165)	(13.1)%
Loss from operations	(17,094)	(8.0)	(27,679)	(11.9)	(10,585)	38.2%
Non-operating income (expense):						
Interest expense	(237)	(1.1)	(129)	(0.1)	(108)	83.7%
Interest and other income (expense), net	919	0.4	1,273	0.6	(354)	(27.8)%
Total non-operating income (expense), net	682	0.3	1,144	0.5	(462)	(40.4)%
Loss before income taxes	(16,412)	(7.7)	(26,535)	(11.4)	10,123	(38.1)%
Provision for income taxes	1,407	0.7	1,082	0.5	325	30.0%
Net loss	$ (17,819)	(8.4)%	$ (27,617)	(11.9)%	$ 9,798	(35.5)%

* not meaningful

	Years Ended December 31,				Increase (Decrease)	
	2018		2017			
	Amount	Percent of Total Revenue	Amount	Percent of Total Revenue	Amount	Percent
Revenue:						
Products	$144,682	62.3%	$149,903	63.7%	$ (5,221)	(3.5)%
Services	87,541	37.7	85,526	36.3	2,015	2.4%
Total revenue	232,223	100.0	235,429	100.0	(3,206)	(1.4)%
Cost of revenue:						
Products	34,066	14.7	36,269	15.4	(2,203)	(6.1)%
Services	17,830	7.6	17,049	7.2	781	4.6%
Total cost of revenue	51,896	22.3	53,318	22.6	(1,422)	(2.7)%
Gross profit	180,327	77.7	182,111	77.4	(1,784)	(1.0)%
Operating expenses:						
Sales and marketing	103,214	44.4	101,360	43.1	1,854	1.8%
Research and development	65,157	28.1	62,991	26.8	2,166	3.4%
General and administrative	39,635	17.1	28,132	11.9	11,503	40.9%
Total operating expenses	208,006	89.6	192,483	81.8	15,523	8.1%
Loss from operations	(27,679)	(11.9)	(10,372)	(4.4)	(17,307)	(166.9)%
Non-operating income (expense):						
Interest expense	(129)	(0.1)	(162)	—	33	20.4%
Interest and other income (expense), net	1,273	0.6	989	0.3	284	28.7%
Total non-operating income (expense), net	1,144	0.5	827	0.3	317	38.3%
Loss before income taxes	(26,535)	(11.4)	(9,545)	(4.1)	(16,990)	(178.0)%
Provision for income taxes	1,082	0.5	1,206	0.5	(124)	(10.3)%
Net loss	$ (27,617)	(11.9)%	$ (10,751)	(4.6)%	$(16,866)	(156.9)%

Revenue

Our products revenue primarily consists of revenue from sales of our hardware appliances upon which our software is installed. Such software includes our ACOS software platform plus one or more of our ADC, CGN, TPS, SSLi or CFW solutions. Purchase of a hardware appliance includes a perpetual license to the included software. We recognize products revenue upon transfer of control, generally at the time of shipment, provided that all other revenue recognition criteria have been met. As a percentage of revenue, our products revenue may vary from quarter to quarter based on, among other things, the timing of orders and delivery of products, cyclicality and seasonality, changes in currency exchange rates and the impact of significant transactions with unique terms and conditions.

We generate services revenue from sales of post contract support (“PCS”), which is bundled with sales of products and professional services. We offer tiered PCS services under renewable, fee-based PCS contracts, primarily including technical support, hardware repair and replacement parts, and software upgrades on a when-and-if-available basis. We recognize services revenue ratably over the term of the PCS contract, which is typically one year, but can be up to seven years.

Our adoption of ASC 606, *Revenue from Contracts with Customers,* in January 2018 resulted in a $2.6 million increase in products revenue in 2018. See Note 2 of the Notes to Consolidated Financial Statements in Part II, Item 8 of this report for additional information.

A summary of our total revenue is as follows (dollars in thousands):

	Years Ended December 31,				Increase (Decrease)	
	2019		2018			
	Amount	Percent of Total Revenue	Amount	Percent of Total Revenue	Amount	Percent
Revenue:						
Products	$121,920	57%	$144,682	62%	$(22,762)	(16)%
Services	90,708	43	87,541	38	3,167	4%
Total revenue	$212,628	100%	$232,223	100%	$(19,595)	(8)%
Revenue by geographic region:						
Americas	$ 89,944	42%	$112,506	48%	$(22,562)	(20)%
Japan	59,454	28	55,205	24	4,249	8%
Asia Pacific, excluding Japan	35,689	17	36,897	16	(1,208)	(3)%
EMEA	27,541	13	27,615	12	(74)	—%
Total revenue	$212,628	100%	$232,223	100%	$(19,595)	(8)%

	Years Ended December 31,				Increase (Decrease)	
	2018		2017			
	Amount	Percent of Total Revenue	Amount	Percent of Total Revenue	Amount	Percent
Revenue:						
Products	$144,682	62%	$149,903	64%	$ (5,221)	(3)%
Services	87,541	38	85,526	36	2,015	2%
Total revenue	$232,223	100%	$235,429	100%	$ (3,206)	(1)%
Revenue by geographic region:						
Americas	$112,506	48%	$122,893	52%	$(10,387)	(8)%
Japan	55,205	24	51,488	22	3,717	7%
Asia Pacific, excluding Japan	36,897	16	33,189	14	3,708	11%
EMEA	27,615	12	27,859	12	(244)	(1)%
Total revenue	$232,223	100%	$235,429	100%	$ (3,206)	(1)%

2019 Revenue Compared to 2018 Revenue

Total revenue decreased by $19.6 million, or 8%, in 2019 compared to 2018. This decrease was due to a $22.8 million decrease in products revenue, partially offset by a $3.2 million increase in services revenue. The decrease in products revenue was primarily driven by lower demand from our service provider and enterprise customers in the Americas, partially offset by an increase in product revenues in Japan.

Products revenue decreased $22.8 million, or 16%, in 2019 compared to 2018 primarily driven by lower demand from our service provider and enterprise customers in the Americas, partially offset by increased revenues in Japan.

Services revenue increased $3.2 million, or 4%, in 2019 compared to 2018. The increases were primarily attributable to the increase in PCS sales in connection with our increased installed customer base.

During 2019, $89.9 million, or 42% of total revenue, was generated from the Americas, which represents a 20% decrease compared to 2018. The decrease was primarily due to lower product revenue driven by lower demand from our service provider and enterprise customers in the Americas.

During 2019, $59.5 million, or 28% of total revenue, was generated from Japan, which represents a 8% increase compared to 2018. The increase was mainly due to increased revenue from our enterprise customers in Japan.

During 2019, $35.7 million, or 17% of total revenue, was generated from the Asia Pacific region excluding Japan, which represents a 3% decrease compared to 2018. The decrease was driven primarily by lower revenues from our enterprise customers in Asia Pacific.

During 2019, $27.5 million, or 13% of total revenue, was generated from EMEA, which remained relatively constant compared to 2018.

2018 Revenue Compared to 2017 Revenue

Total revenue decreased $3.2 million, or 1%, in 2018 compared to 2017. This decrease was due to a $5.2 million decrease in products revenue, partially offset by a $2.0 million increase in services revenue. The decrease in products revenue was primarily driven by lower demand from our service provider customers in the Americas. Revenues from service provider customers decreased 10% in 2018 compared to 2017. Revenue from enterprise customers remained relatively constant in 2018 compared to 2017.

Products revenue decreased $5.2 million, or 3%, in 2018 compared to 2017, primarily driven by lower demand from our service provider customers in the Americas, as well as decreases from EMEA, offset in part by a $2.6 million increase from the adoption of ASC 606 in 2018 and by the increase in products revenue primarily from Japan and Asia Pacific. See Note 2 of the Notes to Consolidated Financial Statements in Part II, Item 8 of this report for additional information related to our adoption of ASC 606.

Services revenue increased $2.0 million, or 2%, in 2018 compared to 2017. The increase was primarily attributable to the increase in PCS sales in connection with our increased installed customer base.

During 2018, $112.5 million, or 48%, of total revenue was generated from the Americas, which represents a 8% decrease compared to 2017. The decrease was primarily due to lower products revenue driven by lower demand from our service providers in the Americas.

During 2018, $55.2 million, or 24%, of total revenue was generated from Japan, which represents a 7% increase in revenue compared to 2017. The increase was mainly due to higher product revenues driven by higher demand from our service providers in Japan.

During 2018, $36.9 million, or 16%, of total revenue was generated from the Asia Pacific regions excluding Japan, which represents a 11% increase compared to 2017. The increase was driven primarily by higher products revenue as well as higher services revenue from PCS sales in connection with our increased installed customer base.

During 2018, $27.6 million, or 12%, of total revenue was generated from EMEA, which remained relatively consistent from 2017.

Cost of Revenue, Gross Profit and Gross Margin

Cost of revenue

Cost of products revenue is primarily comprised of cost of third-party manufacturing services and cost of inventory for the hardware component of our products. Cost of products revenue also includes warehouse personnel costs, shipping costs, inventory write-downs, certain allocated facilities and information technology infrastructure costs, and expenses associated with logistics and quality control.

Cost of services revenue is primarily comprised of personnel costs for our technical support, training and professional service teams. Cost of services revenue also includes the costs of inventory used to provide hardware replacements to end- customers under PCS contracts and certain allocated facilities and information technology infrastructure costs.

A summary of our cost of revenue is as follows (dollars in thousands):

	Years Ended December 31,		Increase (Decrease)	
	2019	2018	Amount	Percent
Cost of revenue:				
Products	$29,816	$34,066	$(4,250)	(12)%
Services	19,065	17,830	1,235	7%
Total cost of revenue	$48,881	$51,896	$(3,015)	(6)%

	Years Ended December 31,		Increase (Decrease)	
	2018	2017	Amount	Percent
Cost of revenue:				
Products	$34,066	$36,269	$(2,203)	(6)%
Services	17,830	17,049	781	5%
Total cost of revenue	$51,896	$53,318	$(1,422)	(3)%

Gross Margin

Gross margin may vary and be unpredictable from period to period due to a variety of factors. These may include the mix of revenue from each of our regions, the mix of our products sold within a period, discounts provided to customers, inventory write-downs and foreign currency exchange rates.

Our sales are generally denominated in U.S. dollars, however, in Japan they are denominated in Japanese yen.

Any of the factors noted above can generate either a favorable or unfavorable impact on gross margin.

A summary of our gross profit and gross margin is as follows (dollars in thousands):

	Years Ended December 31,					
	2019		2018		Increase (Decrease)	
	Amount	Gross Margin	Amount	Gross Margin	Amount	Gross Margin
Gross profit:						
Products	$ 92,104	75.5%	$110,616	76.5%	$(18,512)	(1.0)%
Services	71,643	79.0%	69,711	79.6%	1,932	(0.6)%
Total gross profit	$163,747	77.0%	$180,327	77.7%	$(16,580)	(0.7)%

	Years Ended December 31,					
	2018		2017		Increase (Decrease)	
	Amount	Gross Margin	Amount	Gross Margin	Amount	Gross Margin
Gross profit:						
Products	$110,616	76.5%	$113,634	75.8%	$(3,018)	0.7%
Services	69,711	79.6%	68,477	80.1%	1,234	(0.5)%
Total gross profit	$180,327	77.7%	$182,111	77.4%	$(1,784)	0.3%

2019 Gross Margin Compared to 2018 Gross Margin

Products gross margin decreased by 1.0% in 2019 compared to 2018 primarily driven by changes in product and geographic mix.

Services gross margin decreased by 0.6% in 2019 compared to 2018 primarily due to higher personnel related support costs.

2018 Gross Margin Compared to 2017 Gross Margin

Products gross margin increased by 0.7% in 2018 compared to 2017 primarily driven by a favorable impact from our product mix.

Services gross margin decreased by 0.5% in 2018 compared to 2017 primarily due to higher costs of inventory used to provide hardware replacements to end customers under PCS contracts and higher personnel related support costs.

Operating Expenses

Our operating expenses consist of sales and marketing, research and development, general and administrative, and restructuring expenses. The largest component of our operating expenses is personnel costs which consist of wages, benefits, bonuses, and, with respect to sales and marketing expenses, sales commissions. Personnel costs also include stock-based compensation.

A summary of our operating expenses is as follows (dollars in thousands):

	Years Ended December 31,		Increase (Decrease)	
	2019	2018	Amount	Percent
Operating expenses:				
Sales and marketing	$ 92,783	$103,214	$(10,431)	(10)%
Research and development	61,824	65,157	(3,333)	(5)%
General and administrative	23,704	39,635	(15,931)	(40)%
Restructuring expense	2,530	—	2,530	*
Total operating expenses	$180,841	$208,006	$(27,165)	(13)%

* not meaningful

	Years Ended December 31,		Increase (Decrease)	
	2018	2017	Amount	Percent
Operating expenses:				
Sales and marketing	$103,214	$101,360	$ 1,854	2%
Research and development	65,157	62,991	2,166	3%
General and administrative	39,635	28,132	11,503	41%
Total operating expenses	$208,006	$192,483	$15,523	8%

Sales and Marketing

Sales and marketing expenses are our largest functional category of operating expenses and primarily consist of personnel costs. Sales and marketing expenses also include the cost of marketing programs, trade shows, consulting services, promotional materials, demonstration equipment, depreciation and certain allocated facilities and information technology infrastructure costs. Prior to the adoption of ASC 606, we expensed sales commissions associated with the acquisition of customer contracts as incurred in the period the contract was acquired. Upon the adoption of ASC 606 in January 2018, $8.4 million of our sales commission expenses from prior periods has been deferred and will be recognized over an expected benefit period as required by ASC 340-40, Other Assets and Deferred Costs - Contracts with Customers. See Note 2 of the Notes to Consolidated Financial Statements in Part II, Item 8 of this report for additional information.

The decrease in sales and marketing expenses in 2019 compared to 2018 was primarily due to a 14% decrease in headcount, resulting in $5.7 million lower commissions and bonus, $1.3 million lower salary, $0.9 million lower travel and entertainment and $0.8 million lower depreciation.

The increase in sales and marketing expenses in 2018 compared to 2017 was primarily attributable to a $6.0 million increase in sales commissions driven by higher bookings and higher average commission rate in 2018, offset by a $1.3 million decrease in sales commissions from the adoption of ASC 340-40, *Other Assets and Deferred Costs - Contracts with Customers,* in 2018. The increase in sales and marketing expenses was also offset by a $2.4 million decrease in employee compensation and benefits driven primarily by decreased headcount resulted from improved sales productivity and a $0.8 million decrease in contractor costs.

We expect sales and marketing expenses to decrease in 2020 as a result of the restructuring plan implemented in the fourth quarter of 2019.

Research and Development

Research and development efforts are focused on new product development and on developing additional functionality for our existing products. These expenses primarily consist of personnel costs, and, to a lesser extent, prototype materials, depreciation and certain allocated facilities and information technology infrastructure costs. We expense research and development costs as incurred.

The decrease in research and development expenses in 2019 compared to 2018 was primarily driven by a $2.5 million reduction in employee bonuses, $0.8 million lower salary and $0.5 million lower depreciation expense due to lower lab equipment expenditures.

The increase in research and development expenses in 2018 compared to 2017 was primarily driven by a $2.3 million increase in employee bonuses and a $0.9 million increase in consultant fees, offset by a $1.1 million decrease in salaries and wages due to a change of geographic mix in headcount.

We expect research and development expenses for 2020 to decrease compared to 2019 as a result of the restructuring plan implemented in the fourth quarter of 2019.

General and Administrative

General and administrative expenses primarily consist of personnel costs, professional services and office expenses. General and administrative personnel costs include executive, finance, human resources, information technology, facility and legal related expenses. Professional services primarily consist of fees for outside accounting, tax, legal, recruiting and other administrative services.

The decrease in general and administrative expenses in 2019 compared to 2018 was primarily due to $10.1 million lower legal fees, $1.4 million lower audit-related costs, $1.7 million lower contractor and consultant expense (all related to the prior year litigation settlement, investigation and restatement efforts), $1.0 million lower commission and bonus, $2.3 million reduction in general IT expenses and $0.4 million lower recruiting costs.

The increase in general and administrative expenses in 2018 compared to 2017 was primarily attributable to the $8.6 million internal investigation related fees we incurred in 2018 as we previously disclosed, a $1.6 million increase in contractor and consultant fees primarily for supporting the accounting function and a $0.8 million increase in employee compensation and benefits.

We expect general and administrative expenses for 2020 to decrease compared to 2019 as a result of the restructuring plan implemented in the fourth quarter of 2019.

Restructuring Expense

In October 2019, we began implementing a restructuring plan in our ongoing efforts to reduce operating costs and focus on advanced technologies. The restructuring plan, when complete, is expected to result in a workforce reduction of approximately 5% of our workforce and the closure and consolidation of certain U.S. and international office facilities. We expect to complete the restructuring by the end of the second fiscal quarter of 2020. We recorded restructuring expenses of $2.5 million in the fourth quarter of 2019, which included the following (in thousands):

	Cost of revenue	Sales and marketing	Research and development	General and administrative	Total restructuring expense
Employee severance and related payroll taxes	$28	$1,355	$340	$194	$1,917
Facilities closure expenses		435	89		524
Legal fees				89	89
	$28	$1,790	$429	$283	$2,530

As of December 31, 2019, we had accrued but unpaid restructuring costs of $1.5 million included in accrued liabilities on the Consolidated Balance Sheets.

Interest Expense

Interest expense consists primarily of interest expense and amortization of debt issuance costs. We elected to allow our credit facility to expire in November 2019 without renewal. Should we seek additional sources of funding we may incur increased interest expense and amortization of debt issuance costs.

Interest expense was immaterial in 2019, 2018 and 2017.

Interest and Other Income (Expense), Net

Interest income consists primarily of interest income earned on our cash and cash equivalents and marketable securities. Other income (expense) consists primarily of foreign currency exchange gains and losses.

Interest and other income (expense), net, had an unfavorable change of $0.4 million, or 28%, in 2019 compared to 2018 primarily driven by a $0.7 million increase in foreign exchange loss, partially offset by a $0.4 million increase in interest income.

Interest and other income (expense), net, had a favorable change of $0.3 million, or 29%, in 2018 compared to 2017 primarily due to a $0.7 million increase in interest income, offset by a $0.3 million increase in foreign exchange loss.

Provision for Income Taxes

We recorded an income tax provision of $1.4 million, $1.1 million and $1.2 million for the years ended December 31, 2019, 2018 and 2017, respectively, which primarily consisted of foreign taxes.

We currently maintain a valuation allowance on federal and state deferred tax assets, and we will continue to maintain a valuation allowance against all of our U.S. and certain foreign deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of this allowance.

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: (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries; (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) requiring a current inclusion in U.S. federal taxable income of certain earnings of controlled foreign corporations; (5) eliminating the corporate alternative minimum tax (''AMT'') and changing how existing AMT credits can be realized; (6) creating the base erosion anti-abuse tax, a new minimum tax; (7) creating a new limitation on deductible interest expense; and (8) changing rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017.

As a result of the reduction in the U.S. corporate income tax rate, we revalued our U.S. net deferred tax asset at December 31, 2017. The revaluation is based on the rates at which the U.S. net deferred tax assets are expected to reverse in the future. There was no impact to the balance sheet and income statement due to the full valuation allowance placed on the deferred tax assets for the U.S. See Note 11 to the consolidated financial statements in Part II, Item 8 for further details.

Liquidity and Capital Resources

As of December 31, 2019, we had cash and cash equivalents of $45.7 million, including $7.7 million held outside the United States in our foreign subsidiaries, and $84.2 million of marketable securities. We currently do not have any plans to repatriate our earnings from our foreign operations. As of December 31, 2019, we had working capital of $123.4 million, accumulated deficit of $290.1 million and total stockholders' equity of $108.8 million.

We plan to continue to invest for long-term growth, and our investment may increase. We believe that our existing cash and cash equivalents and marketable securities will be sufficient to meet our anticipated cash needs for at least the next 12 months. Our future capital requirements will depend on many factors, including our growth rate, the expansion of sales and marketing activities, the timing and extent of spending to support development efforts, the introduction of new and enhanced product and service offerings and the continuing market acceptance of our products. In the event that additional financing is required from outside sources, we may not be able to raise such financing on terms acceptable to us or at all. If we are unable to raise additional capital when desired, our business, operating results and financial condition could be adversely affected.

In addition, as described in Note 8 in the Notes to the Consolidated Financial Statements in this report, we are currently, or from time to time, involved in ongoing litigation. Any adverse settlements or judgments in any litigation could have a material adverse impact on our results of operations, cash balances and cash flows in the period in which such events occur.

Credit Agreements

In November 2016, we entered into a loan and security agreement (the ''2016 Credit Facility'') with Silicon Valley Bank (''SVB'') as the lender. The 2016 Credit Facility provided a three-year, $25.0 million revolving credit facility, which included a maximum of $25.0 million letter of credit subfacility. We elected to allow the 2016 Credit Facility to expire without renewal in November 2019. We currently have no plans to enter into any debt or financing arrangement.

Statements of Cash Flows

The following table summarizes our cash flow related activities (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Cash (used in) provided by:			
Operating activities	$ (426)	$(2,694)	$14,314
Investing activities	(251)	(6,876)	(5,142)
Financing activities	5,798	3,624	8,420
Net increase (decrease) in cash and cash equivalents	$5,121	$(5,946)	$17,592

Cash Flows from Operating Activities

Our cash provided by operating activities is driven primarily by sales of our products and management of working capital investments. Our primary uses of cash from operating activities have been for personnel-related expenditures, manufacturing costs, marketing and promotional expenses and costs related to our facilities. Our cash flows from operating activities will continue to be affected principally by the extent to which we increase spending on our business and our working capital requirements.

During the year ended December 31, 2019, cash used in operating activities was $0.4 million, consisting of net loss of $17.8 million, non-cash charges of $26.2 million and an unfavorable net change in operating assets and liabilities of $8.8 million. Our non-cash charges consisted primarily of stock-based compensation expense of $16.5 million and depreciation and amortization expenses of $10.0 million. The net change in our operating assets and liabilities primarily reflects an outflow from the changes in accrued liabilities and other of $5.9 million and inventory of $5.6 million, partially offset by an inflow from changes in deferred revenue of $3.2 million.

The unfavorable change in accrued liabilities and other was driven by an increase in lease liabilities associated with the lease of the San Jose corporate office. The unfavorable change in inventory was due to build up of inventory and timing of shipments, partially offset by increased reserves. The favorable change in deferred revenues was primarily driven by increased bookings.

During the year ended December 31, 2018, cash used in operating activities was $2.7 million, consisting of net loss of $27.6 million which includes payments for our internal investigation costs of $8.6 million, non-cash charges of $25.0 million and an unfavorable net change in operating assets and liabilities of $0.1 million. Our non-cash charges consisted primarily of stock-based compensation expense of $17.0 million and depreciation and amortization expenses of $7.9 million. The net change in our operating assets and liabilities primarily reflects an inflow from the changes in deferred revenue of $7.3 million and accrued and other liabilities of $3.1 million, offset primarily by an outflow from the changes in accounts receivable of $6.1 million, prepaid expenses and other assets of $2.4 million and inventory of $1.5 million.

The favorable change in deferred revenue was primarily driven by the increase in the sale of subscription and support. The favorable change in accrued and other liabilities was primarily due to higher accrued bonuses and commissions, increased value added tax accrual due to timing of payments, and an increase in legal fees accrual. The unfavorable change in accounts receivable was attributed to timing of billing and cash collections. The unfavorable change in prepaid and other assets was mainly driven by the increase in deferred sales commissions due to higher deferred revenue and higher average commission rate. The unfavorable change in inventory was due to the timing of shipments.

During the year ended December 31, 2017, cash provided by operating activities was $14.3 million, consisting of a net loss of $10.8 million, a cash decrease resulting from the net change in operating assets and liabilities of $1.4 million and non-cash charges of $26.4 million. Our non-cash charges consisted primarily of stock-based compensation of $17.2 million, depreciation and amortization of $8.5 million and provision for doubtful accounts and sales returns allowance of $1.1 million. The net change in our operating assets and liabilities primarily reflects an inflow from the changes in accounts receivable of $12.4 million and deferred revenue of $3.0 million, and an outflow from the change in accrued liabilities of $8.9 million, inventory of $4.7 million, prepaid expenses and other assets of $2.4 million and accounts payable of $0.9 million.

The decrease in accounts receivable was primarily due to the timing of billing and cash collections. The increase in deferred revenue was primarily due to higher contract renewals. The decrease in accrued liabilities was primarily due to lower accrued bonuses and commissions. The increase in inventory was primarily due to lower product shipments. The increase in prepaid expenses and other assets was primarily due to prepaid royalties, software subscription renewals and prepaid expenses and deposit related to a sales event. The decrease in accounts payable was primarily due to the timing of vendor invoice payments.

Cash Flows from Investing Activities

During the year ended December 31, 2019, cash used in investing activities was $0.3 million, consisting of purchases of property and equipment of $4.3 million, marketable securities of $71.6 million, partially offset by proceeds from sales and maturities of marketable securities of $75.7 million.

During the year ended December 31, 2018, cash used in investing activities was $6.9 million, consisting of purchases of property and equipment of $2.8 million, marketable securities of $86.8 million and investment of $1.0 million, partially offset by proceeds from sales and maturities of marketable securities of $83.7 million.

During the year ended December 31, 2017, cash used in investing activities was $5.1 million, consisting of purchases of property and equipment of $5.7 million and marketable securities of $87.4 million, partially offset by proceeds from sales and maturities of marketable securities of $88.0 million.

Cash Flows from Financing Activities

During the year ended December 31, 2019, cash provided by financing activities was $5.8 million consisting primarily of proceeds from common stock issuances under our equity incentive plans.

During the year ended December 31, 2018, cash used in financing activities was $3.6 million consisting primarily of proceeds from common stock issuances under our equity incentive plans.

During the year ended December 31, 2017, cash provided by financing activities was $8.4 million, primarily consisting of proceeds from common stock issuances under our equity incentive plans of $12.2 million, partially offset by repurchase and retirement of common stock of $3.1 million and payment of contingent consideration of $0.7 million.

Contractual Obligations

Our contractual obligations consist of operating leases.

The following table summarizes our contractual obligations as of December 31, 2019 (in thousands):

	Total	Less Than 1 Year	1 to 3 Years	3 to 5 Years	More than 5 years
Operating leases	$36,933	$6,050	$14,592	$9,143	$7,148

The contractual obligations table above excludes $4.4 million of tax liabilities related to uncertain tax positions because we are unable to make a reasonably reliable estimate of the timing of settlement, if any, of these future payments.

Off-Balance Sheet Arrangements

As of December 31, 2019, we did not have any off-balance sheet arrangements or relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities that are typically established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Critical Accounting Policies and Estimates

Our consolidated financial statements are prepared in accordance with generally accepted accounting principles in the United States. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue, expenses and related disclosures. We evaluate our estimates and assumptions on an ongoing basis. Our estimates are based on historical experience and various other assumptions that we believe to be reasonable under the circumstances. Our actual results could differ from these estimates.

We believe the following critical accounting policies require us to make significant judgments and estimates in the preparation of our consolidated financial statements.

Inventory

Inventory consists primarily of finished goods and related component parts and is stated at the lower of standard cost (which approximates actual cost on a first-in, first-out basis) or estimated net realizable value. We evaluate inventory for excess and obsolete products, based on management's assessment of future demand and market conditions. Inventory write-downs, once established, are not reversed as they establish a new cost basis for the inventory. Inventory write downs are included as a component of cost of products revenue in the accompanying consolidated statements of operations.

Revenue Recognition

We derive revenue from two sources: (i) products revenue, which includes hardware, perpetual software license and subscription revenue; and (ii) services revenue, which includes post contract support (''PCS''), professional services, and training. A substantial portion of our revenue is from sales of our products and services through distribution channel partners, such as resellers and distributors. Revenue is recognized, net of applicable taxes, upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to be entitled to receive in exchange for those products or services. We apply the following five-step revenue recognition model:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, performance obligations are satisfied.

PCS revenue includes arrangements for software support and technical support for our products. PCS is offered under renewable, fee-based contracts, which include technical support, hardware repair and replacement parts, bug fixes, patches, and unspecified upgrades on a when-and-if available basis. Revenue for PCS services is recognized on a straight-line basis over the service contract term, which is typically one year, but can be up to five years as there is no discernable pattern of transfer related to these promises. Billed but unearned PCS revenue is included in deferred revenue.

Professional service revenue primarily consists of the fees we earn related to installation and consulting services. We recognize revenue from professional services upon delivery or completion of performance. Professional service arrangements are typically short term in nature and are largely completed within 30 to 90 days from the start of service. Revenue is recognized for training when the training course is delivered.

Contracts with Multiple Performance Obligations

Most of our contracts with customers, other than renewals of PCS, contain multiple performance obligations with a combination of products and PCS. Products and PCS generally qualify as distinct performance obligations. Our hardware includes embedded ACOS software, which together deliver the essential functionality of our products. For contracts which contain multiple performance obligations, we allocate revenue to each distinct performance obligation based on the standalone selling price (''SSP''). Judgment is required to determine the SSP for each distinct performance obligation. We use a range of amounts to estimate SSP for products and PCS sold together in a contract to determine whether there is a discount to be allocated based on the relative SSP of the various products and PCS.

If we do not have an observable SSP, such as when we do not sell a product or service separately, then SSP is estimated using judgment and considering all reasonably available information such as market conditions and information about the size and/or purchase volume of the customer. We generally use a range of amounts to estimate SSP for individual products and services based on multiple factors including, but not limited to the sales channel (reseller, distributor or end customer), the geographies in which our products and services are sold, and the size of the end customer.

We account for multiple contracts with a single partner as one arrangement if the contractual terms and/or substance of those agreements indicate that they may be so closely related that they are, in effect, parts of a single contract.

We may occasionally accept returns to address customer satisfaction issues even though there is generally no contractual provision for such returns. We estimate returns for sales to customers based on historical returns rates applied against current-period shipments. Specific customer returns and allowances are considered when determining our sales return reserve estimate.

Our policy applies to the accounting for individual contracts. However, we have elected a practical expedient to apply the guidance to a portfolio of contracts or performance obligations with similar characteristics so long as such application would not differ materially from applying the guidance to the individual contracts (or performance obligations) within that portfolio.

Consequently, we have chosen to apply the portfolio approach when possible, which we do not believe will happen frequently. Additionally, we will evaluate a portfolio of data, when possible, in various situations, including accounting for commissions, rights of return and transactions with variable consideration.

Recent Accounting Pronouncements

Refer to Note 1 in Item 8 of this Form 10-K for information related to recent accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Foreign Currency Risk

Our consolidated results of operations, financial position and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. Historically, the majority of our revenue contracts are denominated in U.S. dollars, with the most significant exception being Japan where we invoice primarily in Japanese yen. Our costs and expenses are generally denominated in the currencies where our operations are located, which is primarily in the Americas, EMEA and, to a lesser extent, Japan and the Asia Pacific region. In 2016, we initiated a hedging program with respect to foreign currency risk. Revenue resulting from selling in local currencies and costs and expenses incurred in local currencies are exposed to foreign currency exchange rate fluctuations, which can affect our revenue and operating income. As exchange rates vary, operating income may differ from expectations.

The functional currency of our foreign subsidiaries is the U.S. dollar. At the end of each reporting period, monetary assets and liabilities are remeasured to the functional currency using exchange rates in effect at the balance sheet date. Non-monetary assets and liabilities are remeasured at historical exchange rates. Gains and losses related to remeasurement are recorded in interest and other income (expense), net in the consolidated statements of operations. A significant fluctuation in the exchange rates between our subsidiaries' local currencies, especially the Japanese yen, British Pound and Euro, and the U.S. dollar could have an adverse impact on our consolidated financial position and results of operations.

We recorded $1.4 million, $0.7 million and $0.4 million and foreign exchange loss during the years ended December 31, 2019, 2018 and 2017, respectively. The effect of a hypothetical 10% change in our exchange rate would not have a significant impact on our consolidated results of operations.

Interest Rate Sensitivity

Our exposure to interest rates risk related to our 2016 Credit Facility with variable interest rates, where an increase in interest rates could have resulted in higher borrowing costs. Since we let our 2016 Credit Facility expire in November 2019, the effect of a hypothetical 10% change in interest rates would not have had any impact on our interest expense.

Our exposure to market risk for changes in interest rates relates primarily to our marketable securities. Our marketable securities are comprised of certificates of deposit, corporate securities, U.S. Treasury and agency securities, commercial paper and asset-backed securities. We do not enter into investments for trading or speculative purposes. At December 31, 2019, our investment portfolio included marketable securities with an aggregate fair market value and amortized cost basis of $84.2 million and $83.9 million, respectively.

The following table presents the hypothetical fair values of our marketable securities assuming immediate parallel shifts in the yield curve of 50 basis points (''BPS''), 100 BPS and 150 BPS as of December 31, 2019 (in thousands):

				Fair Value as of			
	(150 BPS)	(100 BPS)	(50 BPS)	12/31/2019	50 BPS	100 BPS	150 BPS
Marketable securities	$85,002	$84,728	$84,454	$84,180	$83,906	$83,631	$83,357

Item 8. Financial Statements and Supplementary Data

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of A10 Networks, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of A10 Networks, Inc. and subsidiaries (the Company) as of December 31, 2019 and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for the year ended December 31, 2019, and the related notes (collectively referred to as the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of December 31, 2019, 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 consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019, and the results of its operations and its cash flows for the year ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control-Integrated Framework (2013)* issued by COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company changed its method of accounting for leases in 2019 due to the adoption of Accounting Standards Update (ASU) No. 2016-02, *Leases (Topic 842)*.

Basis for Opinion

The Company's management is responsible for these consolidated financial statements, 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 appearing under Item 9A. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (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 the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audit of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinions.

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/ Armanino LLP
San Jose, California
March 9, 2020

We have served as the Company's auditor since 2019.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of A10 Networks, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of A10 Networks, Inc. and subsidiaries (the ''Company'') as of December 31, 2018, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the two 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 the results of its operations and its cash flows for each of the two years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, the Company has changed its method of accounting for revenue from contracts with customers in 2018 due to the adoption of Accounting Standards Update No. 2014-09 *Revenue from Contracts with Customers (Topic 606)* using the modified retrospective approach.

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 Public Company Accounting Oversight Board (United States) (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. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

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
San Jose, California
March 15, 2019

We have served as the Company's auditor since 2011. In 2019, we became the predecessor auditor.

A10 NETWORKS, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except par value)

	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 45,742	$ 40,621
Marketable securities	84,180	87,754
Accounts receivable, net of allowances of $52 and $319, respectively	53,566	53,972
Inventory	22,384	17,930
Prepaid expenses and other current assets	15,067	14,662
Total current assets	220,939	214,939
Property and equipment, net	7,656	7,262
Goodwill	1,307	1,307
Intangible assets	2,305	3,748
Other non-current assets	41,846	8,620
Total assets	$ 274,053	$ 235,876
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 7,592	$ 8,202
Accrued liabilities	27,756	25,291
Deferred revenue, current	62,233	63,874
Total current liabilities	97,581	97,367
Deferred revenue, non-current	38,931	34,092
Other non-current liabilities	28,754	534
Total liabilities	165,266	131,993
Commitments and contingencies (Note 8)		
Stockholders' equity:		
Common stock, $0.00001 par value: 500,000 shares authorized; 77,580 and 74,301 shares issued and outstanding, respectively	1	1
Additional paid-in-capital	398,600	376,272
Accumulated other comprehensive income (loss)	251	(144)
Accumulated deficit	(290,065)	(272,246)
Total stockholders' equity	108,787	103,883
Total liabilities and stockholders' equity	$ 274,053	$ 235,876

See accompanying notes to consolidated financial statements.

A10 NETWORKS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share amounts)

	Years Ended December 31,		
	2019	2018	2017
Revenue:			
Products	$121,920	$144,682	$149,903
Services	90,708	87,541	85,526
Total revenue	212,628	232,223	235,429
Cost of revenue:			
Products	29,816	34,066	36,269
Services	19,065	17,830	17,049
Total cost of revenue	48,881	51,896	53,318
Gross profit	163,747	180,327	182,111
Operating expenses:			
Sales and marketing	92,783	103,214	101,360
Research and development	61,824	65,157	62,991
General and administrative	23,704	39,635	28,132
Restructuring expense	2,530	—	—
Total operating expenses	180,841	208,006	192,483
Loss from operations	(17,094)	(27,679)	(10,372)
Non-operating income (expense):			
Interest expense	(237)	(129)	(162)
Interest and other income, net	919	1,273	989
Total non-operating income (expense), net	682	1,144	827
Loss before income taxes	(16,412)	(26,535)	(9,545)
Provision for income taxes	1,407	1,082	1,206
Net loss	$ (17,819)	$ (27,617)	$ (10,751)
Net loss per share:			
Basic and diluted	$ (0.23)	$ (0.38)	$ (0.15)
Weighted-average shares used in computing net loss per share:			
Basic and diluted	76,080	72,882	70,053

See accompanying notes to consolidated financial statements.

A10 NETWORKS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(in thousands)

	Years Ended December 31,		
	2019	2018	2017
Net loss	$(17,819)	$(27,617)	$(10,751)
Other comprehensive loss, net of tax:			
Unrealized gain (loss) on marketable securities	395	(21)	(78)
Comprehensive loss	$(17,424)	$(27,638)	$(10,829)

See accompanying notes to consolidated financial statements.

A10 NETWORKS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2016	67,873	$ 1	$328,869	$(246,073)	$ (45)	$ 82,752
Cumulative effect adjustment from adoption of ASU 2016-09	—	—	201	(201)	—	—
Stock-based compensation expense	—	—	17,203	—	—	17,203
Common stock issued under employee equity incentive plans	4,256	—	12,244	—	—	12,244
Vesting of early exercise stock options	14	—	87	—	—	87
Repurchase and retirement of common stock	(451)	—	(3,071)	—	—	(3,071)
Unrealized loss on marketable securities, net of tax	—	—	—	—	(78)	(78)
Net loss	—	—	—	(10,751)	—	(10,751)
Balance at December 31, 2017	71,692	1	355,533	(257,025)	(123)	98,386
Cumulative effect adjustment from adoption of ASU 2014-09	—	—	—	12,396	—	12,396
Stock-based compensation expense	—	—	17,038	—	—	17,038
Common stock issued under employee equity incentive plans	2,609	—	3,701	—	—	3,701
Unrealized loss on marketable securities, net of tax	—	—	—	—	(21)	(21)
Net loss	—	—	—	(27,617)	—	(27,617)
Balance at December 31, 2018	74,301	1	376,272	(272,246)	(144)	103,883
Stock-based compensation expense	—	—	16,529	—	—	16,529
Common stock issued under employee equity incentive plans	3,279	—	5,799	—	—	5,799
Unrealized loss on marketable securities, net of tax	—	—	—	—	395	395
Net loss	—	—	—	(17,819)	—	(17,819)
Balance at December 31, 2019	77,580	$ 1	$398,600	$(290,065)	$ 251	$108,787

See accompanying notes to consolidated financial statements.

A10 NETWORKS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net loss	$(17,819)	$(27,617)	$(10,751)
Adjustments to reconcile net loss to net cash (used in) provided by operating activities:			
Depreciation and amortization	10,028	7,880	8,511
Stock-based compensation	16,529	17,038	17,203
Provision for doubtful accounts and sales returns	(190)	212	1,147
Other non-cash items	(153)	(68)	(422)
Changes in operating assets and liabilities:			
Accounts receivable	599	(6,119)	12,362
Inventory	(5,648)	(1,529)	(4,669)
Prepaid expenses and other assets	(452)	(2,434)	(2,399)
Accounts payable	(621)	(603)	(942)
Accrued and other liabilities	(5,897)	3,116	(8,868)
Deferred revenue	3,198	7,331	3,018
Other	—	99	124
Net cash (used in) provided by operating activities	(426)	(2,694)	14,314
Cash flows from investing activities:			
Proceeds from sales of marketable securities	32,200	32,720	27,901
Proceeds from maturities of marketable securities	43,525	51,024	60,138
Purchases of marketable securities	(71,636)	(86,823)	(87,447)
Purchase of investment	—	(1,000)	—
Purchases of property and equipment	(4,340)	(2,797)	(5,734)
Net cash used in investing activities	(251)	(6,876)	(5,142)
Cash flows from financing activities:			
Proceeds from issuance of common stock under employee equity incentive plans	5,799	3,701	12,244
Repurchases and retirement of common stock	—	—	(3,071)
Payment of contingent consideration	—	—	(650)
Other	(1)	(77)	(103)
Net cash provided by financing activities	5,798	3,624	8,420
Net increase (decrease) in cash and cash equivalents	5,121	(5,946)	17,592
Cash and cash equivalents - beginning of period	40,621	46,567	28,975
Cash and cash equivalents - end of period	$ 45,742	$ 40,621	$ 46,567
Supplemental Disclosures:			
Cash paid for income taxes, net of refunds	$ 934	$ 517	$ 1,108
Cash paid for interest	$ 262	$ 100	$ 111
Non-cash investing and financing activities:			
Inventory transfers to property and equipment	$ 1,193	$ 1,176	$ 2,946
Purchases of property and equipment included in accounts payable	$ 10	$ 58	$ 286
Vesting of early exercised stock options	$ —	$ —	$ 87

See accompanying notes to consolidated financial statements.

Notes to Consolidated Financial Statements

1. Description of Business and Summary of Significant Accounting Policies

Description of Business

A10 Networks, Inc. (together with our subsidiaries, the ''Company'', ''we'', ''our'' or ''us'') was incorporated in California in 2004 and reincorporated in Delaware in March 2014. We are headquartered in San Jose, California and have wholly-owned subsidiaries throughout the world including Asia and Europe.

We are a leading provider of secure application solutions and services that enable a new generation of intelligently connected companies with the ability to continuously improve cyber protection and digital responsiveness across dynamic Information Technology (''IT'') and network infrastructures. Our product portfolio seeks to address many of the aforementioned challenges and solution requirements. The portfolio consists of six secure application solutions; Thunder Application Delivery Controller (''ADC''), Lightning Application Delivery Controller (''Lightning ADC''), Thunder Carrier Grade Networking (''CGN''), Thunder Threat Protection System (''TPS''), Thunder SSL Insight (''SSLi'') and Thunder Convergent Firewall (''CFW''), and two intelligent management and automation tools; Harmony Controller and aGalaxy TPS. Our solutions are available in a variety of form factors, such as optimized hardware appliances, bare metal software, containerized software, virtual appliances and cloud-native software.

Basis of Presentation

The accompanying consolidated financial statements include those of A10 Networks, Inc. and its subsidiaries, and have been prepared in accordance with generally accepted accounting principles in the United States of America (''U.S. GAAP'') and pursuant to the rules and regulations of the United States Securities and Exchange Commission (the ''SEC''). All intercompany accounts and transactions have been eliminated in consolidation.

Reclassifications

Certain prior year amounts have been reclassified to conform to current year presentation in the consolidated revenues by geographic region in Note 12. We have combined in the ''Americas'' region, revenues from the United States with revenues from Latin America.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Those estimates and assumptions affect revenue recognition and deferred revenue, the allowance for doubtful accounts, the sales return reserve, the valuation of inventory, the fair value of marketable securities, contingencies and litigation, accrued liabilities, deferred commissions and the determination of fair value of stock-based compensation. These estimates are based on information available as of the date of the consolidated financial statements; therefore, actual results could differ from management's estimates.

Significant Accounting Policies

Cash and Cash Equivalents

Cash and cash equivalents include bank deposits and short-term, highly liquid investments purchased with an original maturity of 90 days or less. Our cash equivalents consist of money market funds.

Marketable securities

We classify our investments in debt securities as available-for-sale and record these investments at fair value. We may sell these investments at any time before their maturities. Accordingly, we classified our securities, including those with maturities exceeding twelve months, as current assets and included in marketable securities on the consolidated balance sheets. Unrealized gains and losses are reported in accumulated other comprehensive loss, net of taxes, in stockholders' equity. Realized gains and losses are determined based on the specific identification method. Realized gains and losses and other-than temporary impairment charges, if any, on marketable securities are reported in interest and other income (expense), net as incurred in the consolidated statements of operations.

We regularly review our investment portfolio to identify and evaluate investments that have indicators of possible impairment. Investments are considered impaired when a decline in fair value is judged to be other-than-temporary. If the cost of an individual investment exceeds its fair value, we evaluate, among other factors, general market conditions, the duration and extent to which the fair value is less than cost, and our intent and ability to hold the investment. Once a decline in fair value is determined to be other-than-temporary, we will record an impairment charge and establish a new cost basis in the investment.

Fair Value Measurement

Our financial instruments consist of cash, cash equivalents, marketable securities, accounts receivable and accounts payable. Our cash equivalents are measured and recorded at fair value on a recurring basis. Marketable securities are comprised of certificates of deposit, corporate securities, U.S. Treasury and agency securities, commercial paper and asset-backed securities and are measured at fair value on a recurring basis. Accounts receivable and accounts payable are stated at their carrying value, which approximates fair value due to the short time to the expected receipt or payment.

Financial instruments recorded at fair value are measured and classified using the three-level valuation hierarchy as described below:

Level 1 - observable inputs for identical assets or liabilities, such as quoted prices in active markets.

Level 2 - inputs other than the quoted prices in active markets that are observable either directly or indirectly.

Level 3 - unobservable inputs in which there is little or no market data, which requires us to develop our own assumptions when pricing the financial instruments.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are recorded at invoice amounts, net of allowances for doubtful accounts. We evaluate the collectability of our accounts receivable based on known collection risks and historical experience. In circumstances where we are aware of a specific customer's inability to meet its financial obligations to us (for examples, bankruptcy filings or substantial downgrading of credit ratings), we record a specific reserve for bad debts against amounts due to reduce the net recognized receivable to the amount we reasonably believe will be collected. For all other customers, we record reserves for bad debts based on the length of time the receivables are past due and our historical experience of collections and write-offs.

Inventory

Inventory is stated at the lower of cost or net realizable value. Inventory cost is determined using first-in, first-out method. We evaluate inventory for excess and obsolete products, based on management's assessment of future demand and market conditions. Inventory write-downs, once established, are not reversed as they establish a new cost basis for the inventory. Inventory write downs are included as a component of cost of products revenue in the consolidated statements of operations.

Property and Equipment, Net

Property and equipment are stated at cost, less accumulated depreciation and amortization. Depreciation is computed using the straight-line method over the estimated useful lives of the related assets. Depreciation on property and equipment, excluding leasehold improvements, ranges from 1 to 3 years.

Leasehold improvements are amortized on a straight-line basis over the shorter of the estimated useful lives of the assets or the remaining lease term. Amortization on leasehold improvements ranges from 2 to 8 years.

Leases

The Company determines if an arrangement is a lease at inception. For leases where the Company is the lessee, right-of-use (''ROU'') assets represent the Company's right to use the underlying asset for the term of the lease and are included within other non-current assets on the consolidated balance sheets, and the lease liabilities represent an obligation to make lease payments arising from the lease and are recorded within accrued liabilities and other non-current liabilities on the consolidated balance sheets. Lease liabilities are recognized at the lease commencement

date based on the present value of the future lease payments over the lease term. The Company uses its incremental borrowing rate based on the information available at the commencement date of the underlying lease arrangement to determine the present value of lease payments. The ROU asset is determined based on the lease liability initially established and reduced for any prepaid lease payments and any lease incentives received. The lease term to calculate the ROU asset and related lease liability includes options to extend or terminate the lease when it is reasonably certain that the Company will exercise the option. The Company's lease agreements generally do not contain any material variable lease payments, residual value guarantees or restrictive covenants.

The Company elected the package of practical expedients permitted under the transition guidance, which allowed for the carry-forward of the Company's historical lease classification and assessment on whether a contract is or contains a lease. The Company elected to not apply the new standard's recognition requirements to leases with an initial term of 12 months or less and instead elected to recognize lease payments in the consolidated statements of operations on a straight-line basis over the lease term.

Lease expense for operating leases is recognized on a straight-line basis over the lease term as an operating expense while expense for financing leases is recognized as depreciation expense and interest expense using the accelerated interest method of recognition. The Company accounts for lease components and non-lease components as a single lease component.

Goodwill

Goodwill represents the excess of purchase consideration over the fair values of assets acquired and liabilities assumed in a business combination. Goodwill is not amortized but is reviewed for possible impairment annually in the fourth quarter or more frequently if impairment indicators arise. We have identified a single reporting unit for the purpose of our goodwill impairment tests, and the fair value of our reporting unit has been determined by our enterprise value. We may elect to utilize a qualitative assessment to determine whether it is more likely than not that the fair value of our reporting unit is less than its carrying value. If, after assessing the qualitative factors, we determine that it is more likely than not that the fair value of our reporting unit is less than its carrying value, an impairment analysis will be performed. We compare the fair value of our reporting unit with its carrying amount and if the carrying value of the reporting unit exceeds its fair value, an impairment loss will be recognized. We did not identify impairment of goodwill for any periods presented.

Intangible Assets

Intangible assets are recorded at fair value and amortized on a straight-line basis over their estimated useful lives, which range from 5 to 11 years. We did not have impairment of intangible assets during the years ended December 31, 2019, 2018 and 2017.

Impairment of Long-Lived Assets

We evaluate our property and equipment for impairment whenever events or changes in circumstances indicate that the carrying amount of our long-lived assets may not be recoverable. Recoverability of an asset group is measured by comparison of its carrying amount to the expected future undiscounted cash flows that the asset group is expected to generate. If it is determined that an asset group is not recoverable, an impairment loss is recorded in the amount by which the carrying amount of the asset group exceeds its fair value.

Revenue Recognition

We recognize revenue when we transfer control of promised goods or services to our customers in an amount that reflects the consideration to which we expect to be entitled to in exchange for those goods or services.

We derive revenue from two sources: (i) products revenue, which includes hardware, perpetual software license and subscription revenue; and (ii) services revenue, which includes post contract support (''PCS''), professional services, and training. A substantial portion of our revenue is from sales of our products and services through distribution channel partners, such as resellers and distributors. Revenue is recognized, net of applicable taxes, upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to be entitled to receive in exchange for those products or services. We apply the following five-step revenue recognition model:

- Identification of the contract, or contracts, with a customer

- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, performance obligations are satisfied.

PCS revenue includes arrangements for software support and technical support for our products. PCS is offered under renewable, fee-based contracts, which include technical support, hardware repair and replacement parts, bug fixes, patches, and unspecified upgrades on a when-and-if available basis. Revenue for PCS services is recognized on a straight-line basis over the service contract term, which is typically one year, but can be up to five years as there is no discernable pattern of transfer related to these promises. Billed but unearned PCS revenue is included in deferred revenue.

Professional service revenue primarily consists of the fees we earn related to installation and consulting services. We recognize revenue from professional services upon delivery or completion of performance. Professional service arrangements are typically short term in nature and are largely completed within 30 to 90 days from the start of service. Revenue is recognized for training when the training course is delivered.

Contracts with Multiple Performance Obligations

Most of our contracts with customers, other than renewals of PCS, contain multiple performance obligations with a combination of products and PCS. Products and PCS generally qualify as distinct performance obligations. Our hardware includes embedded ACOS software, which together deliver the essential functionality of our products. For contracts which contain multiple performance obligations, we allocate revenue to each distinct performance obligation based on the standalone selling price (“SSP”). Judgment is required to determine the SSP for each distinct performance obligation. We use a range of amounts to estimate SSP for products and PCS sold together in a contract to determine whether there is a discount to be allocated based on the relative SSP of the various products and PCS.

If we do not have an observable SSP, such as when we do not sell a product or service separately, then SSP is estimated using judgment and considering all reasonably available information such as market conditions and information about the size and/or purchase volume of the customer. We generally use a range of amounts to estimate SSP for individual products and services based on multiple factors including, but not limited to the sales channel (reseller, distributor or end customer), the geographies in which our products and services are sold, and the size of the end customer.

We account for multiple contracts with a single partner as one arrangement if the contractual terms and/or substance of those agreements indicate that they may be so closely related that they are, in effect, parts of a single contract.

We may occasionally accept returns to address customer satisfaction issues even though there is generally no contractual provision for such returns. We estimate returns for sales to customers based on historical returns rates applied against current-period shipments. Specific customer returns and allowances are considered when determining our sales return reserve estimate.

Our policy applies to the accounting for individual contracts. However, we have elected a practical expedient to apply the guidance to a portfolio of contracts or performance obligations with similar characteristics so long as such application would not differ materially from applying the guidance to the individual contracts (or performance obligations) within that portfolio.

Consequently, we have chosen to apply the portfolio approach when possible, which we do not believe will happen frequently. Additionally, we will evaluate a portfolio of data, when possible, in various situations, including accounting for commissions, rights of return and transactions with variable consideration.

We report revenue net of sales taxes. We include shipping charges billed to customers in revenue and the related shipping costs are included in cost of product revenue.

Deferred Contract Acquisition Costs

We capitalize certain contract acquisition costs consisting of incremental sales commissions incurred to obtain customer contracts. Deferred commissions related to product revenues are recognized upon transfer of control to customers. Deferred commissions related to services revenue are recognized as the related performance obligations

are met. Deferred commissions that will be recognized during the succeeding 12-month period are recorded as prepaid expenses and other current assets, and the remaining portion is recorded as other non-current assets. Amortization of deferred commissions is included in sales and marketing expense.

Research and Development Costs

Research and development efforts are focused on new product development and on developing additional functionality for our existing products. These expenses consist of personnel costs, and to a lesser extent, prototype materials, depreciation and certain allocated facilities and information technology costs. We expense research and development costs as incurred.

Stock-Based Compensation

Stock-based compensation expense is measured on the grant date based on the fair value of the award and recognized on a straight-line basis over the requisite service period, reduced for actual forfeitures. The fair values of restricted stock units (''RSUs'') and performance-based restricted stock units (''PSUs'') are estimated using our stock price on the grant date. The fair value of options and employee stock purchase rights is estimated using the Black-Scholes model on the grant date. The Black-Scholes model determines the fair value of share-based payment awards based on assumptions including expected term, stock price volatility, and risk-free interest rate. The fair value of market-performance based restricted stock units (''MSUs'') is valued using the Monte Carlo simulation model, which uses the stock price, expected volatility and risk-free interest rate to determine the fair value.

Warranty Costs

Our appliance hardware and software generally carry a warranty period of 90 days. Estimates of future warranty costs are based on historical returns and the application of the historical return rates to our in-warranty installed base. Warranty costs to repair or replace items sold to customers have been insignificant for the years ended December 31, 2019, 2018 and 2017.

Foreign Currency

The functional currency of our foreign subsidiaries is the U.S. dollar. Transactions denominated in non-functional currencies are remeasured to the functional currency at the average exchange rate for the period. Non-functional currency monetary assets and liabilities are remeasured to the functional currency using the exchange rate in effect at the balance sheet date, and non-monetary assets and liabilities are remeasured at historical exchange rates. Gains and losses related to remeasurement are recorded in interest and other income (expense), net in the consolidated statements of operations.

Income Taxes

We account for income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in our consolidated financial statements or in our tax returns. Estimates and judgments occur in the calculation of certain tax liabilities and in the determination of the recoverability of certain deferred income tax assets, which arise from temporary differences and carryforwards. Deferred income tax assets and liabilities are measured using the currently enacted tax rates that apply to taxable income in effect for the years in which those tax assets are expected to be realized or settled. We regularly assess the likelihood that our deferred tax assets will be recovered from future taxable income and, to the extent we believe, based upon the weight of available evidence, that it is more likely than not that all or a portion of deferred tax assets will not be realized, a valuation allowance is established through an adjustment to income tax expense.

The factors used to assess the likelihood of realization of our deferred tax assets include our forecast of future taxable income and available tax planning strategies that could be implemented to realize the net deferred tax assets. Assumptions represent our best estimates and involve inherent uncertainties and the application of our judgment.

We account for uncertainty in income taxes recognized in our consolidated financial statements by regularly reviewing our tax positions and benefits to be realized. We recognize tax liabilities based upon our estimate of whether, and the extent to which, additional taxes will be due when such estimates are more-likely-than-not to be

sustained. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained upon examination by taxing authorities. The provision for income taxes includes the effects of any resulting tax reserves, or unrecognized tax benefits, that are considered appropriate as well as the related net interest and penalties.

Advertising Costs

Advertising costs are expensed when incurred. Advertising costs were $0.5 million, $0.7 million and $0.6 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Segment Information

An operating segment is a component of an enterprise for which its discrete financial information is available and its operating results are regularly reviewed by chief operating decision maker for resource allocation decisions and performance assessment. Our chief operating decision maker is our Chief Executive Officer.

Our Chief Executive Officer reviews financial information presented on a consolidated basis for purposes of allocating resources and assessing performance of the Company. Accordingly, we have one reportable segment and one operating segment.

Vendor Business Concentration

We rely on third parties to manufacture our hardware appliances and we purchase raw materials from third-party vendors. We outsourced substantially all of our manufacturing services to three independent manufacturers. In addition, we purchase certain strategic component inventory which is consigned to our third-party manufacturers. Other hardware components included in our products are sourced from various suppliers by our manufacturers and are principally industry standard parts and components that are available from multiple vendors.

Concentration of Credit Risk and Significant Customers

Financial instruments that potentially subject us to concentrations of credit risk consist of cash, cash equivalents, marketable securities and accounts receivable. Our cash, cash equivalents and marketable securities are held and invested in high-credit quality financial instruments by recognized financial institutions and are subject to minimum credit risk.

Our accounts receivable are unsecured and represent amounts due to us based on contractual obligations of our customers. We mitigate credit risk in respect to accounts receivable by performing periodic credit evaluations based on a number of factors, including past transaction experience, evaluation of credit history and review of the invoicing terms of the contract. We generally do not require our customers to provide collateral to support accounts receivable.

Significant customers, including distribution channel partners and direct customers, are those which represent 10% or more of our total revenue for each period presented or our gross accounts receivable balance as of each respective balance sheet date. Revenues from our significant customers as a percentage of our total revenue are as follows:

	Years Ended December 31,		
	2019	2018	2017
Customer A (a distribution channel partner)	*	14%	*
Customer B (a distribution channel partner)	12%	10%	*
Customer C (a distribution channel partner)	14%	*	*

* represents less than 10% of total revenue

As of December 31, 2019, two customers accounted for 17% and 12% of our total gross accounts receivable. As of December 31, 2018, two customers accounted for 16% and 12% of our total gross accounts receivable.

Recently Adopted Accounting Guidance

In May 2017, the Financial Accounting Standards Board (“FASB”) issued ASU No. 2017-09, *Compensation-Stock Compensation (Topic 718): Scope of Modification Accounting*, to provide guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. This standard

is effective for annual periods beginning after December 15, 2017 and interim periods within that reporting period. The amendments will be applied prospectively to an award modified on or after the adoption date. The adoption of ASU 2017-09 on January 1, 2018 did not impact our consolidated financial statements or disclosures.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606),* as subsequently amended, which supersedes the revenue recognition requirements in Accounting Standards Codification (''ASC'') Topic 605, Revenue Recognition. This ASU requires an entity to recognize revenue when it transfers 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. This ASU also includes Subtopic 340-40, *Other Assets and Deferred Costs - Contracts with Customers,* which requires the capitalization of incremental customer acquisition costs and amortization of these costs over the contract period or estimated customer life which resulted in the recognition of a deferred commission asset on our consolidated balance sheet. We adopted ASU 2014-09 and its related amendments (collectively ''ASC 606'') on January 1, 2018 using the modified retrospective method. See Note 2 for disclosure on the impact of adopting this standard.

In March 2018, the FASB issued ASU No. 2018-05, *Income Taxes (Topic 740)*: Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin (SAB) No. 118. These amendments add SEC guidance to the FASB Accounting Standards Codification regarding the Tax Cuts and Jobs Act pursuant to the issuance of SAB 118. The amendments are effective upon addition to the FASB Codification. See Note 11 of this report for disclosures related to the effect of the Tax Cuts and Jobs Act and our utilization of SAB 118.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842),* and subsequent amendments to the initial guidance, in order to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet for those leases classified as operating leases under prior generally accepted accounting principles. ASU 2016-02, as amended, requires that a lessee recognize a liability to make lease payments (the lease liability) and a right-of-use asset (''ROU'') representing its right to use the underlying asset for the lease term on the balance sheet. The Company adopted the standard effective January 1, 2019, using the modified retrospective method, which resulted in the recognition of right-of-use assets of approximately $6.0 million and lease liabilities for operating leases of approximately $6.8 million on the Company's consolidated balance sheets, with no material impact to its consolidated statements of operations. See Note 5 for further information regarding the impact of the adoption of ASU 2016-02 on the Company's consolidated financial statements.

Recent Accounting Pronouncements Not Yet Effective

Effective January 1, 2020, the Company will adopt ASU No. 2016-13, *Financial Instruments-Credit Losses: Measurement of Credit Losses on Financial Instruments (ASU 2016-13)*, as amended, using a modified retrospective approach, with certain exceptions allowed. The standard amends the guidance for measuring and recording credit losses on financial assets measured at amortized cost by replacing the incurred-loss model with an expected-loss model. This new standard also requires that credit losses related to available-for-sale debt securities be recorded as an allowance through net income rather than by reducing the carrying amount under the current, other-than-temporary-impairment model. The Company does not expect the adoption of ASU 2016-13 to have a significant impact on its consolidated financial statements.

Effective January 1, 2020, the Company will adopt ASU No. 2018-13, *Fair Value Measurement (Topic 820 - Changes to the Disclosure Requirements for the Fair Value Measurement)*. Entities will no longer be required to disclose the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy, but public companies will be required to disclose the range and weighted average used to develop significant unobservable inputs for Level 3 fair value measurements. The guidance is effective for all entities for fiscal years beginning after December 15 December 2019 and for interim periods within those fiscal years. The Company does not expect the new guidance to have a significant impact on its consolidated financial statements.

2. Revenue

ASC 606 Adoption Impact

On January 1, 2018, we adopted ASC 606 applying the modified retrospective method. We recognized the cumulative effect of initially applying the new guidance as an adjustment to the opening balance of accumulated deficit as of the adoption date. We applied ASC 606 to all contracts that were not completed at the date of initial application. Comparative information for prior periods has not been restated and continues to be reported under the

accounting standards in effect for those periods. In connection with the adoption of ASC 606, we also adopted ASC 340-40, Other Assets and Deferred Costs - Contracts with Customers, which requires the deferral of incremental costs of obtaining a contract with a customer. Collectively, we refer to ASC 606 and ASC 340-40 as the "new standard."

Adoption of the new standard resulted in changes to our accounting policies for revenue recognition, commissions expense and deferred commissions as discussed below. We recorded a reduction to opening accumulated deficit of $12.4 million as of January 1, 2018 due to the cumulative impact of adopting the new standard as follows:

- A decrease in total deferred revenue of $4.0 million primarily due to the removal of the limitation on contingent revenue that would have accelerated revenue recognition for certain of our historical revenue contracts; and
- Recognition of a deferred commissions asset of $8.4 million on our consolidated balance sheet due to the requirement under the new standard to recognize incremental customer acquisition costs in our consolidated statement of operations as the related performance obligations are met as compared to the previous recognition to expense as incurred.

Impact on the Consolidated Financial Statements

The following tables summarize the impact of the new standard on our consolidated balance sheet and consolidated statement of operations for the period presented:

Selected Consolidated Balance Sheet Line Items

	December 31, 2018		
(in thousands)	**As Reported**	**Adjustments Increase (Decrease)**	**Balance Without Adopting the New Standard**
Assets			
Prepaid expenses and other current assets	$ 14,662	$ (6,557)	$ 8,105
Other non-current assets	8,620	(3,184)	5,436
Liabilities			
Deferred revenue, current	63,874	3,390	67,264
Deferred revenue, non-current	34,092	3,204	37,296
Stockholders' Equity			
Accumulated deficit	(272,246)	(16,335)	(288,581)

Selected Consolidated Statement of Operations Line Items

	Year Ended December 31, 2018		
(in thousands, except per share amounts)	**As Reported**	**Adjustments Increase (Decrease)**	**Balance Without Adopting the New Standard**
Revenue - products	$144,682	$(2,594)	$142,088
Revenue - services	87,541	—	87,541
Total revenue	232,223	(2,594)	229,629
Gross profit	180,327	(2,594)	177,733
Sales and marketing	103,214	1,345	104,559
Total operating expenses	208,006	1,345	209,351
Loss from operations	(27,679)	(3,939)	(31,618)
Net loss	(27,617)	(3,939)	(31,556)
Basic and diluted net loss per share	$ (0.38)		$ (0.43)

Changes in Accounting Policies

Revenue Recognition

We derive revenue from two sources: (i) products revenue, which includes hardware, perpetual software license and subscription revenue; and (ii) services revenue, which includes post contract support ("PCS"), professional

services, and training. A substantial portion of our revenue is from sales of our products and services through distribution channel partners, such as resellers and distributors. Revenue is recognized, net of applicable taxes, upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to be entitled to receive in exchange for those products or services. We apply the following five-step revenue recognition model:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, performance obligations are satisfied.

PCS revenue includes arrangements for software support and technical support for our products. PCS is offered under renewable, fee-based contracts, which include technical support, hardware repair and replacement parts, bug fixes, patches, and unspecified upgrades on a when-and-if available basis. Revenue for PCS services is recognized on a straight-line basis over the service contract term, which is typically one year, but can be up to five years as there is no discernable pattern of transfer related to these promises. Billed but unearned PCS revenue is included in deferred revenue.

Professional service revenue primarily consists of the fees we earn related to installation and consulting services. We recognize revenue from professional services upon delivery or completion of performance. Professional service arrangements are typically short term in nature and are largely completed within 30 to 90 days from the start of service. Revenue is recognized for training when the training course is delivered.

Contracts with Multiple Performance Obligations

Most of our contracts with customers, other than renewals of PCS, contain multiple performance obligations with a combination of products and PCS. Products and PCS generally qualify as distinct performance obligations. Our hardware includes embedded ACOS software, which together deliver the essential functionality of our products. For contracts which contain multiple performance obligations, we allocate revenue to each distinct performance obligation based on the standalone selling price (“SSP”). Judgment is required to determine the SSP for each distinct performance obligation. We use a range of amounts to estimate SSP for products and PCS sold together in a contract to determine whether there is a discount to be allocated based on the relative SSP of the various products and PCS.

If we do not have an observable SSP, such as when we do not sell a product or service separately, then SSP is estimated using judgment and considering all reasonably available information such as market conditions and information about the size and/or purchase volume of the customer. We generally use a range of amounts to estimate SSP for individual products and services based on multiple factors including, but not limited to the sales channel (reseller, distributor or end customer), the geographies in which our products and services are sold, and the size of the end customer.

We account for multiple contracts with a single partner as one arrangement if the contractual terms and/or substance of those agreements indicate that they may be so closely related that they are, in effect, parts of a single contract.

We may occasionally accept returns to address customer satisfaction issues even though there is generally no contractual provision for such returns. We estimate returns for sales to customers based on historical returns rates applied against current-period shipments. Specific customer returns and allowances are considered when determining our sales return reserve estimate.

Our policy applies to the accounting for individual contracts. However, we have elected a practical expedient to apply the guidance to a portfolio of contracts or performance obligations with similar characteristics so long as such application would not differ materially from applying the guidance to the individual contracts (or performance obligations) within that portfolio.

Consequently, we have chosen to apply the portfolio approach when possible, which we do not believe will happen frequently. Additionally, we will evaluate a portfolio of data, when possible, in various situations, including accounting for commissions, rights of return and transactions with variable consideration.

We report revenue net of sales taxes. We include shipping charges billed to customers in revenue and the related shipping costs are included in cost of product revenue.

Contract Balances

The following table reflects contract balances with customers (in thousands):

Balance Sheet Line Reference	As of December 31, 2019	As of December 31, 2018
Accounts receivables, net	$53,566	$53,972
Deferred revenue, current	62,233	63,874
Deferred revenue, non-current	38,931	34,092

We receive payments from customers based upon billing cycles. Invoice payment terms are usually ranging from 30 to 90 days.

Accounts receivable are recorded when the right to consideration becomes unconditional.

Contract assets include amounts related to our contractual right to consideration for performance obligations not yet billed and are included in prepaid and other current assets in the consolidated balance sheets. The contract assets amount is immaterial as of December 31, 2019 and 2018.

Deferred revenue primarily consists of amounts that have been invoiced but not yet been recognized as revenue and consists of performance obligations pertaining to support and subscription services. During the years ended December 31, 2019 and 2018, we recognized revenue of $63.2 million and $60.2 million, related to deferred revenue at the beginning of the period.

Deferred revenue consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Deferred revenue:		
Products	$ 6,593	$ 5,216
Services	94,571	92,750
Total deferred revenue	101,164	97,966
Less: current portion	(62,233)	(63,874)
Non-current portion	$ 38,931	$ 34,092

Deferred Contract Acquisition Costs

As of December 31, 2019, current and non-current portions of deferred contract acquisition costs were $6.2 million and $3.3 million, respectively, and related amortization was $7.4 million for the year ended December 31, 2019. As of December 31, 2018, current and non-current portions of deferred contract acquisition costs were $6.6 million and $3.2 million, respectively, and the related amortization amount was $4.9 million for the year ended December 31, 2018.

For the years ended December 31, 2019 and 2018, we had no impairment loss in relation to the costs capitalized and no asset impairment charges related to contract assets.

Remaining Performance Obligations

Remaining performance obligations represent contracted revenues that are non-cancellable and have not yet been recognized due to unsatisfied or partially satisfied performance obligations, which includes deferred revenues and amounts that will be invoiced and recognized as revenues in future periods.

We expect to recognize revenue on the remaining performance obligations as follows (in thousands):

	December 31, 2019
Within 1 year	$ 62,233
Next 2 to 3 years	30,346
Thereafter	8,585
Total	$101,164

3. Restructuring

In October 2019, the Company began implementing a restructuring plan in its ongoing efforts to reduce operating costs and focus on advanced technologies. The restructuring plan, when complete, is expected to result in a workforce reduction of approximately 5% of the Company's workforce and the closure and consolidation of certain U.S. and international office facilities. The Company expects to complete the restructuring by the end of the second fiscal quarter of 2020. The Company recorded restructuring expenses of $2.5 million in the fourth quarter of 2019, which included the following (in thousands):

	Cost of revenue	Sales and marketing	Research and development	General and administrative	Total restructuring expense
Employee severance and related payroll taxes	$28	$1,355	$340	$194	$1,917
Facilities closure expenses		435	89		524
Legal fees				89	89
	$28	$1,790	$429	$283	$2,530

As of December 31, 2019, the Company had the following accrued and unpaid restructuring charges, included in accrued liabilities on the Consolidated Balance Sheets (in thousands):

Employee severance and related payroll taxes	$ 947
Facilities closure expense	511
Legal fees	97
	$1,555

4. Marketable Securities and Fair Value Measurements

Marketable Securities

Marketable securities, classified as available-for-sale, consisted of the following (in thousands):

	December 31, 2019				December 31, 2018			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	$10,548	$ 10	$—	$10,558	$11,000	$ 7	$ (3)	$11,004
Corporate securities	51,745	207	(1)	51,951	46,442	11	(116)	46,337
U.S. Treasury and agency securities	9,222	3	—	9,225	1,748	—	(12)	1,736
Commercial paper	500		—	500	12,327	1	(5)	12,323
Asset-backed securities	11,914	32	—	11,946	16,381	5	(32)	16,354
Total	$83,929	$252	$ (1)	$84,180	$87,898	$24	$(168)	$87,754

During the years ended December 31, 2019 and 2018, we did not reclassify any amount to earnings from accumulated other comprehensive loss related to unrealized gains or losses.

The following table summarizes the cost and estimated fair value of marketable securities based on stated effective maturities as of December 31, 2019 (in thousands):

	Amortized Cost	Fair Value
Less than 1 year	$26,486	$26,546
Mature in 1 - 3 years	57,443	57,634
Total	$83,929	$84,180

All available-for-sale securities have been classified as current because they are available for use in current operations.

Marketable securities in an unrealized loss position consisted of the following (in thousands):

	Less Than 12 Months		12 Months or More		Total	
As of December 31, 2019	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Certificates of deposit	$ —	$—	$—	$—	$ —	$—
Corporate securities	2,996	(1)	—	—	2,996	(1)
U.S. Treasury and agency securities	—	—	—	—	—	—
Commercial paper	—	—	—	—	—	—
Asset-backed securities	—	—	—	—	—	—
Total	$2,996	$ (1)	$—	$—	$2,996	$ (1)

	Less Than 12 Months		12 Months or More		Total	
As of December 31, 2018	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Certificates of deposit	$ 2,997	$ (3)	$ —	$ —	$ 2,997	$ (3)
Corporate securities	29,435	(68)	7,601	(48)	37,036	(116)
U.S. Treasury and agency securities	992	(7)	744	(5)	1,736	(12)
Commercial paper	9,888	(5)	—	—	9,888	(5)
Asset-backed securities	8,499	(15)	4,758	(17)	13,257	(32)
Total	$51,811	$(98)	$13,103	$(70)	$64,914	$(168)

Based on evaluation of securities that have been in a continuous loss position, we determined the gross unrealized losses on our marketable securities as of December 31, 2019 were temporary in nature and related primarily to interest rate shifts rather than changes in the underlying credit quality of the securities we hold. As we have the ability to hold these investments until maturity, or for the foreseeable future, no decline was deemed to be other-than-temporary.

Fair Value Measurements

The following is a summary of our cash, cash equivalents and marketable securities measured at fair value on a recurring basis (in thousands):

	December 31, 2019				December 31, 2018			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Cash	$35,546	$ —	$—	$ 35,546	$39,113	$ —	$—	$ 39,113
Cash equivalents	10,196	—	—	10,196	1,508	—	—	1,508
Certificates of deposit	—	10,558	—	10,558	—	11,004	—	11,004
Corporate securities	—	51,951	—	51,951	—	46,337	—	46,337
U.S. Treasury and agency securities	—	9,225	—	9,225	—	1,736	—	1,736
Commercial paper	—	500	—	500	—	12,323	—	12,323
Asset-backed securities	—	11,946	—	11,946	—	16,354	—	16,354
Total	$45,742	$84,180	$—	$129,922	$40,621	$87,754	$—	$128,375

There were no transfers between Level 1 and Level 2 fair value measurement categories during the years ended December 31, 2019 and 2018.

5. Leases

We lease various operating spaces in the United States, Asia and Europe under non-cancellable operating lease arrangements that expire on various dates through July 2027. These arrangements require us to pay certain operating expenses, such as taxes, repairs and insurance, and contain renewal and escalation clauses.

The table below presents the Company's right-of-use assets and lease liabilities as of December 31, 2019 (in thousands):

	December 31, 2019
Operating leases	
Right-of-use assets:	
Other non-current assets	$33,014
Total right-of-use assets	$33,014
Lease liabilities:	
Accrued liabilities	$ 5,109
Other non-current liabilities	28,046
Total operating lease liabilities	$33,155

The aggregate future lease payments for operating leases as of December 31, 2019 were as follows (in thousands):

2020	$ 6,050
2021	5,522
2022	4,656
2023	4,414
2024	4,518
Thereafter	11,773
Total lease payments	36,933
Less: imputed interest	(3,778)
Present value of lease liabilities	$33,155

The components of lease costs were as follows (in thousands):

	Year Ended December 31, 2019
Operating lease costs	$3,557
Short-term lease costs	1,203
Total lease costs	$4,760

Average lease terms and discount rates for the Company's operating leases were as follows (in thousands):

	December 31, 2019
Weighted-average remaining term (in years)	7.0
Weighted-average discount rate	3.15%

Supplemental cash flow information for the Company's operating leases (in thousands):

	Year Ended December 31, 2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 4,301
Right-of-use assets obtained in exchange for new lease liabilities	$30,556

New Corporate Office Lease

On May 2, 2019 (the ''Effective Date''), the Company entered into a sublease agreement (the ''Sublease'') with Marvell Semiconductor, Inc. (''Sublandlord'') for its corporate office and research and development space located at 2300 Orchard Parkway, San Jose, California, 95131 (the ''Premises''). The term of the Sublease is seven years and eight months and began on December 1, 2019, the date the Company commenced business operations at the Premises. The Sublease provides for monthly base rent of approximately $262,000 per month for the first year with annual increases thereafter. The total base rent through the end of the term of the Sublease is approximately $33.8 million. In addition to base rent, the Company will also be responsible for operating and other expenses. The Company has accounted for the lease under ASC 842 and recorded a right of use asset of $30.0 million included in other non-current assets and recorded lease liabilities of $3.3 million and $26.7 million, included in accrued liabilities and other non-current liabilities, respectively, on the Consolidated Balance Sheets.

6. Other Balance Sheet Accounts Details

Allowance for Doubtful Accounts

The following table presents the changes in the allowance for doubtful accounts (in thousands):

	December 31, 2019	December 31, 2018
Allowance for doubtful accounts, beginning balance	$ 319	$ 983
Increase (decrease) of provision	(72)	(26)
Write-offs	(195)	(638)
Allowance for doubtful accounts, ending balance	$ 52	$ 319

Inventory

Inventory consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Raw materials	$ 9,495	$ 7,979
Finished goods	12,889	9,951
Total inventory	$22,384	$17,930

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Prepaid expenses	$ 6,163	$ 6,679
Deferred contract acquisition costs	6,231	6,564
Other	2,673	1,419
Prepaid expenses and other current assets	$15,067	$14,662

Property and Equipment, Net

Property and equipment, net, consisted of the following (in thousands):

	Useful Life (in years)	December 31, 2019	December 31, 2018
Equipment	1-3	$ 22,702	$ 49,804
Software	1-3	726	4,088
Furniture and fixtures	1-3	459	967
Leasehold improvements	2-8	5,440	3,832
Construction in progress		—	160
Property and equipment, gross		29,327	58,851
Less: accumulated depreciation		(21,671)	(51,589)
Property and equipment, net		$ 7,656	$ 7,262

Depreciation expense on property and equipment was $5.0 million, $6.4 million and $7.1 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Intangible Assets

Purchased intangible assets, net, consisted of the following (in thousands):

	December 31, 2019			December 31, 2018		
	Cost	Accumulated Amortization	Net	Cost	Accumulated Amortization	Net
Developed technology	$5,050	$(3,535)	$1,515	$5,050	$(2,525)	$2,525
Patents	2,936	(2,146)	790	2,936	(1,713)	1,223
Total	$7,986	$(5,681)	$2,305	$7,986	$(4,238)	$3,748

Amortization expense related to purchased intangible assets was $1.4 million for each of the years ended December 31, 2019, 2018 and 2017. Purchased intangible assets will be amortized over a remaining weighted average useful life of 1.6 years.

Future amortization expense for purchased intangible assets as of December 31, 2019 is as follows (in thousands):

Fiscal Year	
2020	$1,442
2021	863
Total	$2,305

Other non-current assets

Other non-current assets consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Right of use assets	$33,014	$ —
Deferred contract acquisition costs	3,297	3,184
Deposits	2,338	1,975
Other	3,197	3,461
Total other non-current assets	41,846	$8,620

Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Accrued compensation and benefits	$12,227	$15,283
Accrued tax liabilities	4,354	4,455
Lease liabilities	5,109	—
Other	6,066	5,553
Total accrued liabilities	$27,756	$25,291

Other Non-Current Liabilities

Other non-current liabilities consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Lease liabilities	$28,046	$ —
Other	708	534
Total other non-current liabilities	$28,754	$534

7. Credit Facility

In November 2016, we entered into a loan and security agreement (the ''2016 Credit Facility'') with Silicon Valley Bank (''SVB'') as the lender. The 2016 Credit Facility provided a three-year, $25.0 million revolving credit facility, which included a maximum of $25.0 million letter of credit subfacility. Loan advances under the revolving facility were available of up to the full $25.0 million when the balance of our cash, cash equivalents and marketable securities minus outstanding revolving loans and letters of credit equaled or exceeded $50.0 million. If our net cash fell below $50.0 million, loan advances were determined based on a borrowing base equal to a specified percentage of the value of our eligible accounts receivable. Loans bore interest, at our option, at (i) the prime rate reported in The Wall Street Journal, minus 0.50% or (ii) a LIBOR rate determined in accordance with the 2016 Credit Facility, plus 2.50%. Over the term of the 2016 Credit Facility, we paid customary closing fees, commitment fees and letter of credit fees for a facility of this size and type.

In September 2018, we entered into an amendment with SVB to reduce the unused revolving credit facility fee on the 2016 Credit Facility from 0.4% to 0.3%.

Our obligations under the 2016 Credit Facility were secured by substantially all of our assets, excluding our intellectual property. The 2016 Credit Facility required us to maintain compliance with customary affirmative and negative covenants, including compliance with an adjusted quick ratio of not less than 1.50:1.00, as determined in accordance with the 2016 Credit Facility and restricted our ability to pay cash dividends or make other distributions on our capital stock.

On November 1, 2019, the maturity date, we elected to allow the 2016 Credit Facility to expire without renewal. There were no outstanding loans or advances as of the maturity date. We currently have no plans for entering into a new borrowing facility.

8. Commitments and Contingencies

Legal Proceedings

Litigation

From time to time, we may be party or subject to various legal proceedings and claims, either asserted or unasserted, which arise in the ordinary course of business. Some of these proceedings involve claims that are subject to substantial uncertainties and unascertainable damages. We make a provision for a liability when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Unless otherwise specifically disclosed in this note, we have determined that no provision for liability nor disclosure is required related to any claim against us because: (a) there is not a reasonable possibility that a loss exceeding amounts already recognized (if any) may be incurred with respect to such claim; (b) a reasonably possible loss or range of loss cannot be estimated; or (c) such estimate is immaterial.

On March 22, 2018, the Company, and certain of its current and former executive officers, were named as defendants in a putative class action lawsuit filed in the United States District Court for the Northern District of California, captioned Shah v. A10 Networks, Inc. et al., 3:18-cv-01772-VC (the ''Securities Action''). On August 31, 2018, the court appointed a lead plaintiff. On October 5, 2018, the lead plaintiff filed an amended complaint. The amended complaint named the same defendants as the initial complaint, in addition to one of the Company's former executive vice presidents. The amended complaint asserted claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and Rule 10b-5 promulgated thereunder. The Company and individual defendants filed motions to dismiss the amended complaint. On February 21, 2019, the court granted the motions to dismiss with leave to amend within 21 days. The lead plaintiff did not file an amended complaint by the Court-ordered deadline. Instead, on March 21, 2019, the lead plaintiff filed a notice of appeal in the United States Court of Appeals for the Ninth Circuit. On April 5, 2019, the clerk of court suspended briefing on the appeal and ordered that, by April 26, 2019, appellants shall either move for voluntary dismissal or show cause why the appeal should not be dismissed for lack of jurisdiction. On April 25, 2019, appellants moved to voluntarily dismiss the appeal without prejudice, and that motion was granted on May 1, 2019. The district court entered final judgment dismissing lead plaintiff's claims on May 8, 2019. The lead plaintiff subsequently filed a notice of appeal on June 6, 2019. The parties filed a stipulated motion to voluntarily dismiss the appeal on October 7, 2019, with each side to bear its own costs. The Court of Appeals granted the stipulated motion to dismiss on October 10, 2019.

On May 30, 2018, certain of our current and former directors and officers were named as defendants in a putative shareholder derivative lawsuit filed in the United States District Court for the Northern District of California, captioned Moulton v. Chen et al., 3:18-cv-03223-VC (the ''Derivative Action''). We were also named as a nominal defendant. The complaint in the Derivative Action alleged breaches of fiduciary duties and other related claims in connection with purported misrepresentations related to internal controls and revenues and alleged failures to ensure that financial statements were made in accordance with generally accepted accounting principles. Plaintiff sought unspecified damages allegedly sustained by the Company, restitution, and other relief. On July 11, 2018 the Derivative Action was stayed until a motion to dismiss in the Securities Action was granted with prejudice or denied in whole or in part. Following dismissal of the Securities Action, the plaintiff voluntarily dismissed his claims on June 7, 2019.

Investigations

The U.S. Securities and Exchange Commission (''SEC'') conducted a private investigation into possible violations of Section 17(a) of the Securities Act of 1933 and Sections 10(b), 13(a), and 13(b) of the Securities Exchange Act of 1934 (''Exchange Act'') and Rules 10b-5, 12b-20, 13a-1, 13a-11, 13a-13, 13a-14, 13a-15, and 13b2-1 thereunder. The Company cooperated with the SEC regarding this investigation. The SEC staff informed the Company on September 6, 2019 that it had concluded its investigation and did not intend to recommend an enforcement action to the SEC.

Lease Commitments

We lease various operating spaces in the United States, Asia and Europe under non-cancelable operating lease arrangements that expire on various dates through July 2027. These arrangements require us to pay certain operating expenses, such as taxes, repairs and insurance, and contain renewal and escalation clauses. We recognize rent expense under these arrangements on a straight-line basis over the term of the lease.

We have open purchase commitments with third-party contract manufacturers with facilities in Taiwan to supply nearly all of our finished goods inventories, spare parts, and accessories. These purchase orders are expected to be paid within one year of the issuance date.

The following table summarizes our non-cancelable operating leases as of December 31, 2019 (in thousands):

Years Ending December 31,	Operating Leases and Other Contractual Obligation
2020	$ 6,050
2021	5,522
2022	4,656
2023	4,414
2024	4,518
Thereafter	11,773
Total	$36,933

Rent expense was $4.8 million, $4.5 million and $4.1 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Guarantees and Indemnifications

In the normal course of business, we provide indemnifications to customers against claims of intellectual property infringement made by third parties arising from the use of our products. Other guarantees or indemnification arrangements include guarantees of product and service performance, and standby letters of credit for lease facilities and corporate credit cards. We have not recorded a liability related to these indemnifications and guarantee provisions and our guarantees and indemnification arrangements have not had any significant impact on our consolidated financial statements to date.

9. Equity Incentive Plans and Stock-Based Compensation

Equity Incentive Plans

2014 Equity Incentive Plan

The 2014 Equity Incentive Plan (the ''2014 Plan'') provides for the granting of stock options, restricted stock awards, restricted stock units (''RSUs''), performance-based RSUs (''PSUs''), stock appreciation rights, performance units and performance shares to our employees, consultants and members of our board of directors. In June 2015, our board of directors adopted and our stockholders approved an amendment and restatement of the 2014 Plan, which increased the number of shares available for issuance under the 2014 Plan by the number of shares granted under the 2008 Stock Plan (the ''2008 Plan'') that were or may in the future be canceled or otherwise forfeited or repurchased after March 20, 2014. As of December 31, 2019, we had 10,738,780 shares available for future grant under the 2014 Plan.

The shares authorized for the 2014 Plan increase annually by the least of (i) 8,000,000 shares, (ii) 5% of the outstanding shares of common stock on the last day of our immediately preceding fiscal year, or (iii) such other amount as determined by our Board of Directors. Accordingly, on January 1, 2020, the number of shares in the 2014 Plan increased by 3,879,002 shares, representing 5% of the common stock outstanding as of December 31, 2019.

To date, we have granted stock options, RSUs and PSUs under the 2014 Plan. Stock options expire no more than 10 years from the grant date and generally vest over four years. In the case of an incentive stock option granted to an employee, who at the time of grant, owns stock representing more than 10% of the total combined voting power of all classes of stock, the per share exercise price will be no less than 110% of the fair market value per share on the date of grant, and the incentive stock option will expire no later than five years from the date of grant. For incentive stock options granted to any other employees and nonstatutory stock options granted to employees, consultants, or members of our Board of Directors, the per share exercise price will be no less than 100% of the fair market value per share on the date of grant. RSUs and PSUs generally vest from one to four years.

2014 Employee Stock Purchase Plan

The 2014 Employee Stock Purchase Plan (the ''2014 Purchase Plan'') was suspended effective March 16, 2018 due to the delay of the Form 10-K filing for the year ended December 31, 2017. In October 2018, the Board of Directors approved amending the 2014 Purchase Plan (the ''Amended 2014 Purchase Plan'') in order to, among other things, reduce the maximum contribution participants can make under the plan from 15% to 10% of eligible compensation. The Amended 2014 Purchased Plan also reflects revised offering periods, which were changed from 24 months to six months in duration and that begin on or about December 1 and June 1 each year, starting in December 2018. The Amended 2014 Purchase Plan permits eligible employees to purchase shares of our common stock through payroll deductions with up to 10% of their pre-tax eligible earnings subject to certain Internal Revenue Code limitations. The purchase price of the shares is 85% of the lower of the fair market value of our common stock on the first day of a six-month offering period or the relevant purchase date. In addition, no participant may purchase more than 1,500 shares of common stock in each purchase period.

Employees purchased 662,362 shares at an average price of $5.14 and intrinsic value of $0.8 million during the year ended December 31, 2019. The intrinsic value is calculated as the difference between the market value on the date of purchase and the purchase price of the shares. During 2018, there were no stock purchases by employees under the Amended 2014 Purchase Plan or the 2014 Purchase Plan. As of December 31, 2019, we had 2,402,820 shares available for future issuance under the Amended 2014 Purchase Plan.

Stock-Based Compensation

A summary of our stock-based compensation expense is as follows (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Stock-based compensation by type of award:			
Stock options	$ 648	$ 1,353	$ 2,705
Stock awards	14,882	10,445	11,421
Employee stock purchase rights[1]	999	5,240	3,077
Total	$16,529	$17,038	$17,203
Stock-based compensation by category of expense:			
Cost of revenue	$ 1,500	$ 1,602	$ 1,362
Sales and marketing	5,765	5,667	6,075
Research and development	6,039	6,631	6,343
General and administrative	3,225	3,138	3,423
Total	$16,529	$17,038	$17,203

1) Amount for the year ended December 31, 2018 includes $4.1 million of accelerated stock-based compensation expense. In March 2018, as a result of a suspension of the 2014 Purchase Plan due to our non-timely filing status, all unrecognized stock-based compensation expense related to ESPP under the 2014 Purchase Plan was accelerated and recognized within the consolidated statement of operations.

As of December 31, 2019, we had $29.5 million of unrecognized stock-based compensation expense related to unvested stock-based awards, including ESPP under our Amended 2014 Purchase Plan, which will be recognized over a weighted-average period of 2.6 years.

Fair Value Determination:

The fair values of stock options and employee stock purchase rights were estimated as of the grant date using the Black-Scholes option-pricing model with the following assumptions:

	Stock Options			Employee Stock Purchase Rights		
	Years Ended December 31,			Years Ended December 31,		
	2019	2018	2017	2019	2018	2017
Expected term (in years)	—	4.8	4.7	0.5	0.5	1.3
Risk-free interest rate	—%	3.1%	2.0%	2.3%	2.6%	1.4%
Expected volatility	—%	37%	43%	34%	28%	39%
Dividend rate	—%	—%	—%	—%	—%	—%

- ***Expected Term.*** We estimate the expected life of options based on an analysis of our historical experience of employee exercise and post-vesting termination behavior considered in relation to the contractual life of the option. The expected term for the employee stock purchase rights is based on the term of the purchase period.
- ***Risk-Free Interest Rate.*** The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant for zero coupon U.S. Treasury notes with maturities approximately equal to the expected terms of stock options and the employee stock purchase rights.
- ***Expected Volatility.*** For stock options, due to the limited trading history of our own common stock, we determined the share price volatility factor based on a combination of the historical volatility of our own common stock and the historical volatility of our peer group for the stock options. For employee stock purchase rights, we used the historical volatility of our own common stock.
- ***Dividend Rate.*** The expected dividend was assumed to be zero as we have never paid dividends and do not anticipate paying any dividends in the foreseeable future.

Stock Options

The following tables summarize our stock option activities and related information:

	Number of Shares (thousands)	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value[(1)] (thousands)
Outstanding as of December 31, 2018	4,674	$5.19		
Granted	—	$ —		
Exercised	(842)	$2.84		
Canceled	(130)	$9.41		
Outstanding as of December 31, 2019	3,702	$5.57	3.52	$6,395
Vested and exercisable as of December 31, 2019	3,427	$5.49	3.56	$6,210

(1) The aggregate intrinsic value represents the excess of the closing price of our common stock of $6.87 as of December 31, 2019 over the exercise price of the outstanding in-the-money options.

Following is additional information pertaining to our stock option activities (in thousands, except per share data):

	Years Ended December 31,		
	2019	2018	2017
Weighted-average grant date fair value of options granted (per share)	$ —	$ 2.19	$ 3.14
Intrinsic value of options exercised[(1)]	$1,930	$2,629	$8,013

(1) Intrinsic value of options exercised is the difference between the closing price of our common stock at the time of exercise and the exercise price paid.

Stock Awards

We have granted RSUs to our employees, consultants and members of our Board of Directors, and PSUs to certain executives.

In February 2016, we granted 547,000 PSUs with certain financial and operational targets. Actual performance, as measured at the time and prior to the restatement of the 2016 financial statements, resulted in participants achieving 80% of target. Given the PSUs did not contain explicit or implicit claw back rights, there was no change to stock-based compensation expense for the impact of the previously disclosed restatement of the 2016 consolidated financial statements. As of December 31, 2019, 253,203 shares had vested, 200,297 shares had been forfeited, and the remaining 93,500 shares will vest (as to 80%) in annual tranches through February 2020 subject to continued service vesting requirements.

In October 2018, we granted 464,888 PSUs with certain financial targets. These PSUs will become eligible to vest at 75% upon the achievement of the performance targets by December 31, 2020, and are subject to service condition vesting requirements. The remaining 25% of these PSUs will become eligible to vest on the first anniversary of the initial vesting date. None of these PSUs were vested as of December 31, 2019.

In April 2019, we granted 346,453 PSUs with certain financial targets. These PSUs will become eligible to vest at 75% on the second month following achievement of certain performance targets by December 31, 2021, with the remaining 25% of the PSUs to vest on the first anniversary of the initial vesting date, subject to continued service vesting requirements. None of these PSUs were vested as of December 31, 2019.

In December 2019, we granted 375,000 PSUs with certain market performance-based targets to be achieved between December 2019 and December 2023. One-third of each tranche of these PSUs will become eligible to vest on each of the three anniversaries of the date the performance-based target is achieved, subject to continued service vesting requirements. The grant date fair values of each tranche of these PSUs were estimated to be $4.59, $4.06 and $3.59 and determined using the Monte Carlo simulation model with the following assumptions: expected term of 4.0 years, expected volatility of 38.45%, risk-free interest rate of 1.7% and expected dividend yield of 0.0%. None of these PSUs were vested as of December 31, 2019.

The following table summarizes our stock award activities and related information:

	Number of Shares (thousands)	Weighted-Average Grant Date Fair Value	Weighted-Average Remaining Vesting Term (years)
Nonvested as of December 31, 2018	5,974	$6.51	
Granted	3,288	$6.74	
Released	(1,774)	$6.60	
Canceled	(1,340)	$6.57	
Nonvested as of December 31, 2019	6,148	$6.59	1.81

Following is additional information pertaining to our RSU activities (in thousands, except per share data):

	Years Ended December 31,		
	2019	2018	2017
Weighted-average grant date fair value of stock awards granted (per share)	$ 6.74	$ 5.95	$ 8.55
Total fair value of stock awards released (vested) during the period	$12,183	$9,714	$13,961

10. Net Loss Per Share

Basic net loss per share is computed using the weighted average number of common shares outstanding for the period. Diluted net loss per share is computed using the weighted average number of common shares outstanding for the period plus potential dilutive common shares, including stock options, RSUs and employee stock purchase rights, unless the potential common shares are anti-dilutive. Since we had net losses in the years ended December 31, 2019, 2018 and 2017, none of the potential dilutive common shares were included in the computation of diluted shares for these periods, as inclusion of such shares would have been anti-dilutive.

The following table presents common shares related to potentially dilutive shares excluded from the calculation of diluted net loss per share as their effect would have been anti-dilutive (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Stock options, RSUs and employee stock purchase rights	9,199	9,621	12,184

11. Income Taxes

The geographical breakdown of loss before income taxes is as follows (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Domestic loss	$(20,345)	$(29,658)	$(13,752)
Foreign income	3,933	3,123	4,207
Loss before income taxes	$(16,412)	$(26,535)	$ (9,545)

The provision for income taxes consisted of the following (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Current provision for income taxes:			
State	$ 49	$ 44	$ 48
Foreign	1,716	953	1,023
Total current	1,765	997	1,071
Deferred tax expense (benefit):			
Federal	3	(13)	26
Foreign	(361)	98	109
Total deferred	(358)	85	135
Provision for income taxes	$1,407	$1,082	$1,206

The reconciliation of the statutory federal income tax and the provision for income tax is as follows (in thousands, except percentages).

	Years Ended December 31,					
	2019		2018		2017	
	Amount	Percentage	Amount	Percentage	Amount	Percentage
Tax at statutory rate	$(3,447)	21.0%	$(5,572)	21.0%	$ (3,245)	34.0%
State tax - net of federal benefits	42	(0.3)	39	(0.1)	32	(0.3)
Foreign rate differential	363	(2.2)	258	(1.0)	(655)	6.9
Changes in federal valuation allowance	4,695	(28.6)	6,430	(24.2)	(21,038)	220.4
Change in federal tax rate due to Tax Cuts and Jobs Act	—	—	—	—	28,185	(295.3)
Stock-based compensation	578	(3.5)	1,950	(7.3)	(1,169)	12.2
Non-deductible meals and entertainment expenses	287	(1.8)	342	(1.3)	243	(2.5)
Other permanent items	257	(1.6)	351	(1.3)	104	(1.1)
Federal tax credits - net of uncertain tax position	(1,809)	11.0	(2,634)	9.9	(1,634)	17.1
Expenses for uncertain tax positions	166	(1.0)	137	(0.5)	311	(3.3)
Other	275	(1.6)	(219)	0.7	72	(0.7)
Provision for income taxes	$ 1,407	(8.6)%	$ 1,082	(4.1)%	$ 1,206	(12.6)%

The tax effects of temporary differences that give rise to significant portions of deferred tax assets (liabilities) are as follows (in thousands):

	December 31, 2019	December 31, 2018
Deferred tax assets:		
Net operating loss carryforwards	$ 46,273	$ 43,869
Research and development credits, net of uncertain tax positions	25,386	22,051
Accruals, reserves, and other	12,021	11,264
Stock-based compensation	3,306	2,628
Depreciation and amortization	2,219	1,952
Operating lease liability	7,061	—
Gross deferred tax assets	96,266	81,764
Valuation allowance	(85,743)	(78,681)
Total deferred tax assets	10,523	3,083
Deferred tax liabilities:		
Deferred contract acquisition costs	(2,245)	(2,256)
Operating lease right of use asset	(7,088)	—
Other	(19)	(13)
Total deferred tax liabilities	(9,352)	(2,269)
Net deferred tax assets	$ 1,171	$ 814

Recognition of deferred tax assets is appropriate when realization of these assets is more likely than not. Based upon the weight of available evidence, which includes our historical operating performance and the recorded cumulative net losses in prior fiscal periods, we recorded a full valuation allowance of $85.7 million and $78.7 million against the U.S. net deferred tax assets as of December 31, 2019 and 2018, respectively. For the years ended December 31, 2019 and 2018, the valuation allowance increased by $7.1 million and $6.2 million, respectively.

As of December 31, 2019 and 2018, we had U.S. federal net operating loss carryforwards of $193.8 million and $185.0 million, respectively, and state net operating loss carryforwards of $84.6 million and $75.3 million, respectively. The federal net operating loss carryforwards will expire at various dates beginning in the year ending December 31, 2025, if not utilized. The state net operating losses expire in various years ending between 2023 and 2039, if not utilized.

Additionally, as of December 31, 2019 and 2018, we had U.S. federal research and development credit carryforwards of $15.3 million and $13.3 million, and state research and development credit carryforwards of $16.4 million and $14.2 million, respectively. The federal credit carryforwards will begin to expire at various dates beginning in 2025 while the state credit carryforwards can be carried over indefinitely.

Utilization of the net operating losses and credit carryforwards may be subject to an annual limitation provided for in the Internal Revenue Code Section 382 and similar state codes. Any annual limitation could result in the expiration of net operating loss and credit carryforwards before utilization.

With respect to our undistributed foreign subsidiaries' earnings we consider those earnings to be indefinitely reinvested and, accordingly, no related provision for U.S. federal and state income taxes has been provided. Our intention has not changed subsequent to the one-time transition tax under the Tax Act. Upon distribution of those earnings in the form of dividends or otherwise, we may be subject to both U.S. income taxes subject to an adjustment for foreign tax credits and withholding taxes in the various countries. As of December 31, 2019 and 2018, the undistributed earnings approximated $13.6 million and $10.8 million, respectively. Our undistributed earnings through December 31, 2017 have been taxed under the one-time transition tax under the Tax Act.

Uncertain Tax Positions

As of December 31, 2019, 2018 and 2017, we had gross unrecognized tax benefits of $4.4 million, $4.2 million and $3.8 million, respectively. Accrued interest expense related to unrecognized tax benefits is recognized as part of our income tax provision in our consolidated statements of operations and is immaterial for the years ended December 31, 2019 and 2018. Our policy for classifying interest and penalties associated with unrecognized income tax benefits is to include such items in income tax expense.

The activity related to the unrecognized tax benefits is as follows (in thousands):

	Years Ended December 31,		
	2019	**2018**	**2017**
Gross unrecognized tax benefits—beginning balance	$4,191	$3,782	$3,360
Increases (decrease) related to tax positions from prior years	(280)	(266)	(151)
Increases related to tax positions taken during current year	530	675	573
Decreases related to tax positions taken during the current year	—	—	—
Gross unrecognized tax benefits—ending balance	$4,441	$4,191	$3,782

These amounts are related to certain deferred tax assets with a corresponding valuation allowance. As of December 31, 2019, the total amount of unrecognized tax benefits, if recognized, that would affect the effective tax rate is $1.0 million. We do not anticipate a material change to our unrecognized tax benefits over the next twelve months. Unrecognized tax benefits may change during the next twelve months for items that arise in the ordinary course of business.

We are subject to taxation in the United States, various states, and several foreign jurisdictions. Because we have net operating loss and credit carryforwards, there are open statutes of limitations in which federal, state and foreign taxing authorities may examine our tax returns for all years from 2005 through the current period. We are not currently under examination by any taxing authorities.

The Tax Cuts and Jobs Act

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: (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (3) requiring a current inclusion in U.S. federal taxable income of certain earnings of controlled foreign corporations; (4) eliminating the corporate alternative minimum tax (''AMT'') and changing how existing AMT credits can be realized; (5) creating the base erosion anti-abuse tax, a new minimum tax; (6) creating a new limitation on deductible interest expense; and (7) changing rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017.

On December 22, 2017, the SEC issued SAB 118, which provides guidance on accounting for the income tax effects of the Tax Act. SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting relating to the Tax Act under Accounting Standards Codification Topic 740, ''*Income Taxes*'' (''ASC 740''). In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for Tax Act-related income tax effects is incomplete, but the company is able to determine a reasonable estimate, it must record a provisional estimate in its financial statements. If a company cannot determine a provisional estimate to be included in its financial statements, it should continue to apply ASC 740 on the basis of the provisions of the tax laws that were in effect immediately before the enactment of the Tax Act. We have completed our analysis of the Tax Act's income tax effects. In accordance with SAB 118, the Tax Act-related income tax effects that we initially reported as provisional estimates were refined as additional analysis was performed. We have elected to account for Global Intangible Low-Taxed Income under the Tax Act as period costs when incurred. There was no material impact to our consolidated financial statements when our analysis was completed in the fourth quarter of 2018.

12. Geographic Information

The following table depicts the disaggregation of revenue by geographic region based on the ship to location of our customers and is consistent with how we evaluate our financial performance (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Americas	$ 89,944	$112,506	$122,893
Japan	59,454	55,205	51,488
Asia Pacific, excluding Japan	35,689	36,897	33,189
EMEA	27,541	27,615	27,859
Total	$212,628	$232,223	$235,429

The following table is a summary of our long-lived assets which include property and equipment, net and right of use assets based on the physical location of the assets (in thousands):

	December 31, 2019	December 31, 2018
United States	$35,964	$5,525
Japan	2,689	1,108
Other	2,017	629
Total	$40,670	$7,262

13. Employee Benefit Plan

We adopted a profit sharing plan qualified under Section 401(k) of the Internal Revenue Code which is offered to all of our United States employees. Participants in the plan may elect to contribute up to $19,000 of their annual compensation to the plan for the 2019 calendar year. Individuals who are 50 or older may contribute an additional $6,000 of their annual income. In 2019, we matched 50% of the first 6% of the employee's eligible compensation for a maximum employer contribution of $2,500 per participant. We contributed $0.7 million, $1.0 million and $1.0 million during the years ended December 31, 2019, 2018 and 2017, respectively.

14. Selected Quarterly Financial Data (Unaudited)

Selected quarterly financial data for 2019 and 2018 is as follows (in thousands, except per share amounts):

	Quarter Ended			
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
Revenue	$ 50,290	$49,189	$52,833	$60,316
Gross profit	$ 38,040	$37,918	$40,913	$46,876
Net income (loss)	$(12,272)	$ (5,771)	$ 173	$ 51
Net loss per share - basic	$ (0.16)	$ (0.08)	$ —	$ —
Net loss per share - diluted	$ (0.16)	$ (0.08)	$ —	$ —

	Quarter Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Revenue	$ 49,183	$60,713	$60,502	$61,825
Gross profit	$ 37,299	$47,526	$47,488	$48,014
Net loss	$(19,670)	$ (4,532)	$ (1,807)	$ (1,608)
Net loss per share - basic	$ (0.27)	$ (0.06)	$ (0.02)	$ (0.02)
Net loss per share - diluted	$ (0.27)	$ (0.06)	$ (0.02)	$ (0.02)

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Management's Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019, as required by Rule 13a-15(b) under the Securities Exchange Act of 1934, or the Exchange Act. The term ''disclosure controls and procedures,'' as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by the company in the reports that it files or submits to the SEC, under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and financial officers, as appropriate to enable timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, our management recognizes that any disclosure controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that our management is required to apply its judgment in evaluating the benefits of possible controls and procedures relative to their costs.

The Company previously disclosed material weaknesses in internal control over financial reporting as of December 31, 2018 and December 31, 2017 in its Annual Report on Form 10-K for the years ended December 31, 2018 and December 31, 2017. The material weaknesses related to our control environment and monitoring activities and revenue recognition. The material weaknesses led to the restatement of our annual consolidated financial statements for the years ended December 31, 2016 and 2015. As described below, management developed and implemented remediation actions to address the material weaknesses and further actions are ongoing as of December 31, 2019.

During 2019, management implemented various initiatives intended to address the identified material weaknesses and strengthen our overall internal control environment. Management reported to the Audit Committee regarding its development and implementation of these remediation actions. In this regard, some of our key remedial initiatives included:

- *Executive Management Communications to Reinforce Compliance* - Our Chief Executive Officer and Chief Financial Officer, at the direction of our Board of Directors, have in communications to personnel continued to reinforce the importance of adherence to our policies and procedures regarding ethics and compliance and the importance of identifying misconduct and raising and communicating concerns.
- *Changes to Our Executive Management and Sales Personnel* - We have hired new personnel, who have enabled improved lines of communication across business functions, to address areas of identified gaps in expertise.
- *Training Practices* - We developed and have provided comprehensive training programs relating to revenue recognition and contract review and have deployed training to our sales personnel.
- *Credit Policies and Procedures* - We have improved our practices regarding extension of credit to customers and evaluation of customer creditworthiness.
- *Revenue Recognition Policies and Procedures* - We have implemented improvements to our revenue recognition policies and procedures.
- *Implementation and Enhancement of Entity Level Controls* - We have implemented additional controls in our quarterly/annual financial reporting process, including enhanced sub-certifications by all sales

personnel, as well as other key personnel in our finance, human resources, and legal functions. The enhanced sub-certifications include specific documentation related to the identification of non-standard revenue arrangements. We have also enhanced our insider trading policy and related communications to employees.

During the fourth quarter of 2019, we completed our testing of the operating effectiveness of the remediation actions implemented and found the implemented controls are designed and operating effectively. As a result, we concluded that the material weaknesses have been remediated as of December 31, 2019.

Based on this evaluation, our Chief Executive Officer and Chief Financial Officer, as our principal executive officer and principal financial officer, respectively, concluded that our disclosure controls and procedures were effective as of December 31, 2019, and that the consolidated financial statements included in this Form 10-K present fairly, in all material respects, and in conformity with U.S. GAAP our financial position, results of operations and cash flows for the periods presented.

Management's Report on Internal Control Over Financial Reporting

Our management 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). Internal control over financial reporting consists of policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- Are designed and operated to provide reasonable assurance regarding the reliability of our financial reporting and our process for the preparation of financial statements for external purposes 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
- 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.

Our internal control over financial reporting is designed by, and under the supervision of our principal executive officer and principal financial officer and effected by our Board of Directors, management, and others. 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 internal control policies or procedures may deteriorate.

Management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2019, using the criteria set forth in the *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (''COSO''). Based on the assessment, our management has concluded that our internal control over financial reporting was effective as of December 31, 2019 to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with GAAP.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by Armanino LLP, an independent registered public accounting firm, as stated in its report, which is included in this Annual Report on Form 10-K.

Changes to Internal Control over Financial Reporting

Except for the changes in relation to our implementation of the remediation actions described above, no other change in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) occurred during the quarter ended December 31, 2019, that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls

Our management, including our principal executive officer and our principal financial officer, does not expect that our disclosure controls or our internal control over financial reporting will prevent or detect all error and all fraud. A control system, no matter how well-designed and operated, can provide only reasonable, not absolute, assurance

that the control system's objectives will be met. The design of a control system must reflect the fact that there are resource constraints and the benefits of controls must be considered relative to their costs. Further, because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been detected. The design of any system of controls is based in part on certain assumptions about the likelihood of future events and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Projections of any evaluation of the effectiveness of controls to future periods are subject to risks. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item will be included in an amendment to this report or in our Proxy Statement for the 2020 Annual Meeting of Stockholders and is incorporated by reference in this report.

Item 11. Executive Compensation

The information required by this item will be included in an amendment to this report or in our Proxy Statement for the 2020 Annual Meeting of Stockholders and is incorporated by reference in this report.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this item will be included in an amendment to this report or in our Proxy Statement for the 2020 Annual Meeting of Stockholders and is incorporated by reference in this report.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this item will be included in an amendment to this report or in our Proxy Statement for the 2020 Annual Meeting of Stockholders and is incorporated by reference in this report.

Item 14. Principal Accounting Fees and Services

The information required by this item will be included in an amendment to this report or in our Proxy Statement for the 2020 Annual Meeting of Stockholders and is incorporated by reference in this report.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a) The following documents are filed as part of this Annual Report on Form 10-K:

1. **Consolidated Financial Statements**
   Our Consolidated Financial Statements are listed in the Index to Consolidated Financial Statements in Part II, Item 8 of this Annual Report on Form 10-K.
2. **Consolidated Financial Statement Schedules**
   All other schedules have been omitted as they are not required, not applicable, or the required information is otherwise included.
3. **Exhibits.**
   The following exhibits are filed with or incorporated by reference in this report, in each case as indicated therein (numbered in accordance with Item 601 of Regulation S-K).

EXHIBIT INDEX

Exhibit Number	Description	Incorporated by Reference Form	SEC File No.	Exhibit Number	Filing Date	Filed Herewith
3.1	Amended and Restated Certificate of Incorporation of the Registrant	8-K	001-36343	3.1	December 6, 2019	
3.2	Amended and Restated Bylaws of the Registrant	8-K	001-36343	3.2	December 6, 2019	
4.1	Form of common stock certificate of the Registrant	S-1/A	333-194015	4.1	March 10, 2014	
4.2	Amended and Restated Investors' Rights Agreement among the Registrant and certain holders of its capital stock, amended as of October 4, 2013	S-1/A	333-194015	4.2	March 10, 2014	
4.3	Description of the Registrant's securities					X
10.1*	Form of Indemnification Agreement between the Registrant and each of its directors and executive officers	S-1/A	333-194015	10.1	March 10, 2014	
10.2*	2008 Stock Plan and forms of agreements thereunder	10-Q	001-36343	10.2	May 13, 2014	
10.3*	Amended and Restated 2014 Equity Incentive Plan	10-Q	001-36343	10.1	August 6, 2015	
10.4*	Amended 2014 Employee Stock Purchase Plan					X
10.5*	2014 Employee Stock Purchase Plan and forms of agreements thereunder	S-1/A	333-194015	10.5	March 10, 2014	
10.6*	Form of Stock Option Agreement pursuant to the 2008 Stock Plan	10-Q	001-36343	10.2	August 4, 2014	
10.7*	Form of Stock Option Agreement- Early Exercise pursuant to the 2008 Stock Plan	10-Q	001-36343	10.3	August 4, 2014	
10.8*	Form of Stock Option Agreement pursuant to the Amended and Restated 2014 Equity Incentive Plan	10-Q	001-36343	10.4	August 4, 2014	
10.9*	Form of Restricted Stock Unit Agreement pursuant to the Amended and Restated 2014 Equity Incentive Plan	10-Q	001-36343	10.5	August 4, 2014	
10.10*	Offer Letter, dated November 12, 2019, by and between the Registrant and Dhrupad Trivedi	8-K	001-36343	10.2	November 21, 2019	
10.11*	Form of CEO Change in Control and Severance Agreement	8-K	001-36343	10.3	November 21, 2019	
10.12*	Offer Letter, dated January 4, 2012, by and between the Registrant and Robert Cochran	S-1/A	333-194015	10.9	March 10, 2014	
10.13	Reseller Agreement, dated April 2, 2009, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.12	February 18, 2014	
10.14	First Amendment to Reseller Agreement, dated May 19, 2011, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.13	February 18, 2014	
10.15	Second Amendment to Reseller Agreement, dated April 1, 2011, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.14	February 18, 2014	
10.16	Third Amendment to Reseller Agreement, dated April 1, 2011, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.15	February 18, 2014	
10.17	Fourth Amendment to Reseller Agreement, dated October 3, 2011, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.16	February 18, 2014	
10.18	Fifth Amendment to Reseller Agreement, dated April 2, 2012, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.17	February 18, 2014	
10.19	Sixth Amendment to Reseller Agreement, dated November 29, 2012, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.18	February 18, 2014	
10.20	Seventh Amendment to Reseller Agreement, dated April 9, 2013, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.19	February 18, 2014	
10.21	Eighth Amendment to Reseller Agreement, dated October 22, 2013, by and between the Registrant and NEC Corporation	S-1/A	333-194015	10.20	February 18, 2014	
10.22	Ninth Amendment to Reseller Agreement, executed on April 22, 2014, by and between the Registrant and NEC Corporation	10-Q	001-36343	10.1	August 4, 2014	
10.23	Manufacturing Services Agreement, dated December 8, 2006, by and between the Registrant and Lanner Electronics (USA)	S-1/A	333-194015	10.21	February 18, 2014	

Exhibit Number	Description	Incorporated by Reference				Filed Herewith
		Form	SEC File No.	Exhibit Number	Filing Date	
10.24	Amendment No. 1 to Manufacturing Services Agreement, dated June 27, 2013, by and between the Registrant and Lanner Electronics (USA)	S-1/A	333-194015	10.22	February 18, 2014	
10.25	Contract Manufacturer Agreement, dated July 1, 2008, by and between the Registrant and AEWIN Technologies, Inc.	S-1/A	333-194015	10.23	February 18, 2014	
10.26	Amendment No. 1 to Contract Manufacturer Agreement, dated June 30, 2014, by and between the Registrant and AEWIN Technologies, Inc.	10-K	001-36343	10.31	March 11, 2015	
10.27*	Form of Change in Control and Severance Agreement	S-1/A	333-194015	10.25	March 10, 2014	
10.28*	Executive Incentive Compensation Plan	10-K	001-6343	10.32	March 1, 2016	
10.29*	Offer Letter, dated May 14, 2017, by and between the Registrant and Tom Constantino	10-Q	001-36343	10.1	August 3, 2017	
10.30*	Offer Letter, dated December 15, 2017, by and between the Registrant and Christopher White	10-K	001-36343	10.33	August 29, 2018	
10.31*	Letter Agreement, dated as of March 14, 2018November 20, 2019, among A10 Networks, Inc., VIEX Opportunities Fund, LP - Series One, VIEX GP, LLC, VIEX Special Opportunities Fund II, LP, VIEX Special Opportunities GP II, LLC, VIEX Capital Advisors, LLC and Eric Singer	8-K	001-36343	10.1	November 21, 2019	
10.32	Sublease Agreement, dated May 2, 2019, by and between Marvell Corporation and the Registrant	10-Q	001-36343	10.1	May 8, 2019	
21.1	List of subsidiaries of the Registrant					X
23.1	Consent of Armanino LLP, independent registered public accounting firm					X
23.2	Consent of Deloitte & Touche LLP, independent registered public accounting firm					X
	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act					X
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act					X
32.1**	Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act					X
32.2**	Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act					X
101.INS	XBRL Instance Document.					X
101.SCH	XBRL Taxonomy Extension Schema Document.					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.					X

* Indicates a management contract or compensatory plan.

** The certifications attached as Exhibit 32.1 and 32.2 that accompany this Annual Report on Form 10-K are not deemed filed with the Securities and Exchange Commission and are not to be incorporated by reference into any filing of A10 Networks, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements 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.

A10 NETWORKS, INC.

Date: March 10, 2020

By: /s/ Dhrupad Trivedi

Dhrupad Trivedi
Chief Executive Officer and President
(Principal Executive Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this annual report on Form 10-K has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated.

Signature	Title	Date
/s/ Dhrupad Trivedi Dhrupad Trivedi	Chief Executive Officer, President and Chairman of the Board (Principal Executive Officer)	March 10, 2020
/s/ Tom Constantino Tom Constantino	Chief Financial Officer (Principal Financial and Accounting Officer)	March 10, 2020
/s/ J. Michael Dodson J. Michael Dodson	Director	March 10, 2020
/s/ Eric Singer Eric Singer	Director	March 10, 2020
/s/ Peter Y. Chung Peter Y. Chung	Director	March 10, 2020
/s/ Alan S. Henricks Alan S. Henricks	Director	March 10, 2020
/s/ Tor R. Braham Tor R. Braham	Director	March 10, 2020

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Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statement Nos. 333-194719, 333-202652, 333-209835, 333-212954, 333-216208, 333-227781 and 333-230350 on Form S-8 of our report dated March 9, 2020, relating to the consolidated financial statements of A10 Networks, Inc. and its subsidiaries (the ''Company''), and the effectiveness of the Company's internal control over financial reporting, appearing in this Annual Report on Form 10-K of A10 Networks, Inc. for the year ended December 31, 2019.

/s/ Armanino LLP

San Jose, California
March 9, 2020

Exhibit 23.2

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-194719, 333-202652, 333-209835, 333-212954, 333-216208, 333-227781, and 333-230350 on Form S-8 of our report dated March 15, 2019, relating to the consolidated financial statements of A10 Networks, Inc. and its subsidiaries (the ‘‘Company’’) (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the Company’s adoption of Accounting Standards Update No. 2014-09 Revenue from Contracts with Customers (Topic 606)) appearing in the Annual Report on Form 10-K of A10 Networks, Inc. for the year ended December 31, 2019.

/s/ DELOITTE & TOUCHE LLP

San Jose, California
March 9, 2020

Exhibit 31.1

CERTIFICATION

I, Dhrupad Trivedi, certify that:

1. I have reviewed this Annual Report on Form 10-K of A10 Networks, Inc. for the quarter ended December 31, 2019;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 10, 2020

By: /s/ Dhrupad Trivedi

Dhurpad Trivedi
President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION

I, Tom Constantino, certify that:

1. I have reviewed this Annual Report on Form 10-K of A10 Networks, Inc. for the quarter ended December 31, 2019;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f) for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 10, 2020

By: /s/ Tom Constantino

Tom Constantino
Executive Vice President and Chief Financial Officer
(Principal Accounting and Financial Officer)

Exhibit 32.1

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of A10 Networks, Inc. (the ‘‘Company’’) for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the ‘‘Report’’), I, Dhrupad Trivedi, President and Chief Executive Officer of the Company, certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 10, 2020

By: /s/ Dhrupad Trivedi

Dhrupad Trivedi
President and Chief Executive Officer

Exhibit 32.2

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of A10 Networks, Inc. (the ''Company'') for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the ''Report''), I, Tom Constantino, Executive Vice President and Chief Financial Officer of the Company, certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 10, 2020

By: /s/ Tom Constantino

Tom Constantino
Executive Vice President and Chief Financial Officer(Principal Accounting and Financial Officer)

BOARD OF DIRECTORS

Dhrupad Trivedi
President, Chief Executive Officer and Director

Tor R. Braham
Director

Peter Y. Chung
Director

J. Michael Dodson
Director

Alan S. Henricks
Director

Eric Singer
Director

MANAGEMENT TEAM

Dhrupad Trivedi
President, Chief Executive Officer and Director

Tom Constantino
Executive Vice President, Chief Financial Officer

Robert Cochran
Executive Vice President, Legal and Corporate Collaboration, Chief Risk Compliance Officer and Secretary

Gunter Reiss
Vice President of Worldwide Marketing

Eric Kwok
Vice President of Worldwide Support and Services

Todd Kleppe
Vice President of Global Operations

Andrew Kim
Vice President of Worldwide Human Resources

ADDITIONAL CORPORATE INFORMATION

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http://investors.a10networks.com

Transfer Agent and Registrar
Computershare Trust Company, N.A.
250 Royall Street
Canton, Massachusetts 02021
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CORPORATE HEADQUARTERS

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