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

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 2021

☐ **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 001-38267

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

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

6500 Chase Oaks Boulevard, Suite 100, Plano, Texas 75023
(Address of principal executive offices) (Zip code)

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

N/A
(Former name, former address and former fiscal year, if changed since last report)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.0001	RBBN	The Nasdaq Global Select Market

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 x No o

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 x No o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See 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) o

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

As of October 21, 2021, there were 148,624,895 shares of the registrant's common stock, $0.0001 par value per share, outstanding.

RIBBON COMMUNICATIONS INC.
FORM 10-Q
QUARTERLY PERIOD ENDED SEPTEMBER 30, 2021
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Cautionary Note Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q contains "forward-looking statements" within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which are subject to a number of risks and uncertainties. All statements other than statements of historical facts contained in this Quarterly Report on Form 10-Q, including statements regarding our future expenses, results of operations and financial position, integration activities, expected impacts of the ongoing COVID-19 pandemic, beliefs about our business strategy, availability of components for the manufacturing of our products, expected benefits from our acquisition of ECI Telecom Group Ltd. ("ECI") and the sale of our Kandy Communications business, plans and objectives of management for future operations, plans for future cost reductions, if any, restructuring activities, and plans for future product offerings, development and manufacturing are forward-looking statements. Without limiting the foregoing, the words "anticipates", "believes", "could", "estimates", "expects", "intends", "may", "plans", "seeks" and other similar language, whether in the negative or affirmative, are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are unknown and/or difficult to predict and that may cause our actual results, performance or achievements to be materially different from those expressed or implied by the forward-looking statements. Such risks and uncertainties include, but are not limited to, supply chain disruptions resulting from component availability and/or geopolitical instabilities and disputes, risks related to the ongoing COVID-19 pandemic on the global economy and financial markets as well as on the Company, our customers and suppliers, which may impact our sales, gross margin, customer demand and our ability to supply our products to our customers; failure to realize anticipated benefits of our acquisition of ECI; failure to achieve the expected benefits from the sale of our Kandy Communications business or declines in the value of our ongoing investment in American Virtual Cloud Technologies, Inc. ("AVCT"), the purchaser of the Kandy Communications business; unpredictable fluctuations in quarterly revenue and operating results; risks related to cybersecurity and data intrusion; failure to compete successfully against telecommunications equipment and networking companies; failure to grow our customer base or generate recurring business from our existing customers; credit risks; the timing of customer purchasing decisions and our recognition of revenues; macroeconomic conditions; the impact of restructuring and cost-containment activities; litigation; market acceptance of our products and services; rapid technological and market change; our ability to protect our intellectual property rights and obtain necessary licenses; our ability to maintain partner, reseller, distribution and vendor support and supply relationships; the potential for defects in our products; risks related to the terms of our credit agreement; higher risks in international operations and markets; increases in tariffs, trade restrictions or taxes on our products; currency fluctuations; and/or failure or circumvention of our controls and procedures. We therefore caution you against relying on any of these forward-looking statements.

Additional important factors that could cause actual results to differ materially from those in these forward-looking statements are also discussed in Part I, Item 2, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Part II, Item 1A. "Risk Factors" of this Quarterly Report on Form 10-Q and Part I, Item 1A and Part II, Item 7A, "Risk Factors" and "Quantitative and Qualitative Disclosures About Market Risk," respectively, of our Annual Report on Form 10-K for the year ended December 31, 2020. Any forward-looking statement made by us in this Quarterly Report on Form 10-Q speaks only as of the date on which this Quarterly Report on Form 10-Q was first filed. We undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise.

PART I FINANCIAL INFORMATION

Item 1. Financial Statements

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Balance Sheets
(in thousands, except share and per share data)
(unaudited)

	September 30, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 101,212	$ 128,428
Restricted cash	2,543	7,269
Accounts receivable, net	235,710	237,738
Inventory	44,789	45,750
Other current assets	34,399	28,461
Total current assets	418,653	447,646
Property and equipment, net	48,557	48,888
Intangible assets, net	367,131	417,356
Goodwill	416,892	416,892
Investments	50,439	115,183
Deferred income taxes	10,673	10,651
Operating lease right-of-use assets	54,446	69,757
Other assets	19,834	20,892
	$ 1,386,625	$ 1,547,265
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of term debt	$ 20,058	$ 15,531
Accounts payable	63,253	63,387
Accrued expenses and other	94,021	134,865
Operating lease liabilities	17,848	17,023
Deferred revenue	89,553	96,824
Total current liabilities	284,733	327,630
Long-term debt, net of current	354,778	369,035
Operating lease liabilities, net of current	58,609	72,614
Deferred revenue, net of current	21,618	26,010
Deferred income taxes	13,477	16,842
Other long-term liabilities	39,862	48,281
Total liabilities	773,077	860,412
Commitments and contingencies (Note 19)		
Stockholders' equity:		
Preferred stock, $0.01 par value per share; 10,000,000 shares authorized, none issued and outstanding	—	—
Common stock, $0.0001 par value per share; 240,000,000 shares authorized; 148,613,829 shares issued and outstanding at September 30, 2021; 145,425,248 shares issued and outstanding at December 31, 2020	15	15
Additional paid-in capital	1,870,711	1,870,256
Accumulated deficit	(1,259,353)	(1,178,476)
Accumulated other comprehensive income (loss)	2,175	(4,942)
Total stockholders' equity	613,548	686,853
	$ 1,386,625	$ 1,547,265

See notes to the unaudited condensed consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Operations
(in thousands, except per share data)
(unaudited)

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Revenue:				
Product	$ 111,726	$ 128,926	$ 322,744	$ 325,687
Service	98,672	102,192	291,636	273,906
Total revenue	210,398	231,118	614,380	599,593
Cost of revenue:				
Product	53,494	58,545	144,580	145,103
Service	36,576	37,619	110,498	105,745
Total cost of revenue	90,070	96,164	255,078	250,848
Gross profit	120,328	134,954	359,302	348,745
Operating expenses:				
Research and development	49,132	49,113	143,339	143,204
Sales and marketing	36,113	36,898	108,212	101,767
General and administrative	12,148	16,021	40,435	48,320
Amortization of acquired intangible assets	17,221	16,349	50,225	45,352
Acquisition-, disposal- and integration-related	1,955	1,366	4,204	14,607
Restructuring and related	1,767	3,290	10,547	10,726
Total operating expenses	118,336	123,037	356,962	363,976
Income (loss) from operations	1,992	11,917	2,340	(15,231)
Interest expense, net	(2,969)	(6,854)	(11,836)	(15,649)
Other (expense) income, net	(57,702)	407	(65,970)	(2,844)
(Loss) income before income taxes	(58,679)	5,470	(75,466)	(33,724)
Income tax (provision) benefit	(752)	782	(5,411)	(1,445)
Net (loss) income	$ (59,431)	$ 6,252	$ (80,877)	$ (35,169)
(Loss) earnings per share				
Basic	$ (0.40)	$ 0.04	$ (0.55)	$ (0.26)
Diluted	$ (0.40)	$ 0.04	$ (0.55)	$ (0.26)
Weighted average shares used to compute (loss) earnings per share:				
Basic	148,184	144,948	147,204	136,837
Diluted	148,184	151,680	147,204	136,837

See notes to the unaudited condensed consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Comprehensive Income (Loss)
(in thousands)
(unaudited)

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Net (loss) income	$ (59,431)	$ 6,252	$ (80,877)	$ (35,169)
Other comprehensive income (loss), net of tax:				
Unrealized gain (loss) on interest rate swap	860	640	7,324	(12,857)
Foreign currency translation adjustments	193	184	(207)	1,031
Other comprehensive income (loss), net of tax	1,053	824	7,117	(11,826)
Comprehensive (loss) income, net of tax	$ (58,378)	$ 7,076	$ (73,760)	$ (46,995)

See notes to the unaudited condensed consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Stockholders' Equity
(in thousands, except shares)
(unaudited)

Three months ended September 30, 2021

	Common stock						
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income	Total stockholders' equity
Balance at July 1, 2021	148,057,301	$ 15	$ 1,868,066	$ (1,199,922)	$ 1,122	$ 669,281
Exercise of stock options	213					—
Vesting of restricted stock awards and units	855,440					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(299,125)		(1,916)			(1,916)
Stock-based compensation expense			4,561			4,561
Other comprehensive income					1,053	1,053
Net loss				(59,431)		(59,431)
Balance at September 30, 2021	148,613,829	$ 15	$ 1,870,711	$ (1,259,353)	$ 2,175	$ 613,548

Nine months ended September 30, 2021

	Common stock					
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive (loss) income	Total stockholders' equity
Balance at January 1, 2021	145,425,248	$ 15	$ 1,870,256	$ (1,178,476)	$ (4,942)	$ 686,853
Exercise of stock options	13,815		24			24
Vesting of restricted stock awards and units	3,320,644					—
Vesting of performance-based stock units	1,525,681					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(1,671,559)		(13,980)			(13,980)
Stock-based compensation expense			14,411			14,411
Other comprehensive income					7,117	7,117
Net loss				(80,877)		(80,877)
Balance at September 30, 2021	148,613,829	$ 15	$ 1,870,711	$ (1,259,353)	$ 2,175	$ 613,548

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Stockholders' Equity (continued)
(in thousands, except shares)
(unaudited)

Three months ended September 30, 2020

	Common stock						
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive (loss) income	Total stockholders' equity
Balance at July 1, 2020	144,856,764	$ 14	$ 1,863,374	$ (1,308,488)	$ (10,123)	$ 544,777
Exercise of stock options	2,926		6			6
Vesting of restricted stock awards and units	454,178	1				1
Vesting of performance-based stock units	7,886					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(94,870)		(388)			(388)
Stock-based compensation expense			3,969			3,969
Other comprehensive income					824	824
Net income				6,252		6,252
Balance at September 30, 2020	145,226,884	$ 15	$ 1,866,961	$ (1,302,236)	$ (9,299)	$ 555,441

Nine months ended September 30, 2020

	Common stock					
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income (loss)	Total stockholders' equity
Balance at January 1, 2020	110,471,995	$ 11	$ 1,747,784	$ (1,267,067)	$ 2,527	$ 483,255
Exercise of stock options	16,128		29			29
Vesting of restricted stock awards and units	1,971,730	1				1
Vesting of performance-based stock units	323,752					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(373,272)		(1,196)			(1,196)
Shares issued as consideration in connection with the acquisition of ECI Telecom Group Ltd.	32,500,000	3	108,547			108,550
Shares issued as consideration in connection with the acquisition of Anova Data, Inc.	316,551		1,630			1,630
Stock-based compensation expense			10,167			10,167
Other comprehensive loss					(11,826)	(11,826)
Net loss				(35,169)		(35,169)
Balance at September 30, 2020	145,226,884	$ 15	$ 1,866,961	$ (1,302,236)	$ (9,299)	$ 555,441

See notes to the unaudited condensed consolidated financial statements.

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Cash Flows
(in thousands)
(unaudited)

	Nine months ended	
	September 30, 2021	**September 30, 2020**
Cash flows from operating activities:		
Net loss	$ (80,877)	$ (35,169)
Adjustments to reconcile net loss to cash flows provided by operating activities:		
Depreciation and amortization of property and equipment	12,684	12,754
Amortization of intangible assets	50,225	45,352
Amortization of debt issuance costs	4,227	4,915
Stock-based compensation	14,411	10,167
Deferred income taxes	(3,295)	(2,455)
Gain on sale of business	(2,772)	—
Decrease in fair value of investments	64,745	—
Reduction in deferred purchase consideration	—	(69)
Foreign currency exchange losses	3,235	3,162
Changes in operating assets and liabilities:		
Accounts receivable	1,892	42,489
Inventory	253	6,285
Other operating assets	11,303	36,416
Accounts payable	2,194	(54,489)
Accrued expenses and other long-term liabilities	(58,661)	10,143
Deferred revenue	(11,665)	(14,253)
Net cash provided by operating activities	7,899	65,248
Cash flows from investing activities:		
Purchases of property and equipment	(14,279)	(18,685)
Business acquisitions, net of cash acquired	—	(346,852)
Proceeds from sale of business	2,944	—
Proceeds from the sale of fixed assets	—	43,500
Net cash used in investing activities	(11,335)	(322,037)
Cash flows from financing activities:		
Borrowings under revolving line of credit	—	615
Principal payments on revolving line of credit	—	(8,615)
Proceeds from issuance of term debt	74,625	478,500
Principal payments of term debt	(87,161)	(131,279)
Principal payments of finance leases	(736)	(971)
Payment of debt issuance costs	(789)	(14,065)
Proceeds from the exercise of stock options	24	29
Payment of tax withholding obligations related to net share settlements of restricted stock awards	(13,980)	(1,196)
Net cash (used in) provided by financing activities	(28,017)	323,018
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(489)	24
Net (decrease) increase in cash, cash equivalents and restricted cash	(31,942)	66,253
Cash, cash equivalents and restricted cash, beginning of year	135,697	44,643
Cash, cash equivalents and restricted cash, end of period	$ 103,755	$ 110,896

RIBBON COMMUNICATIONS INC.
Condensed Consolidated Statements of Cash Flows (continued)
(in thousands)
(unaudited)

	Nine months ended	
	September 30, 2021	September 30, 2020
Supplemental disclosure of cash flow information:		
Interest paid	$ 11,410	$ 10,845
Income taxes paid	$ 11,944	$ 6,652
Income tax refunds received	$ 983	$ 196
Supplemental disclosure of non-cash investing activities:		
Capital expenditures incurred, but not yet paid	$ 1,807	$ 4,111
Acquisition purchase consideration - deferred payments	$ —	$ 1,630
Common stock issued as purchase consideration	$ —	$ 108,550
Supplemental disclosure of non-cash financing activities:		
Total fair value of restricted stock awards, restricted stock units and performance-based stock units on date vested	$ 38,879	$ 5,551

See notes to the unaudited condensed consolidated financial statements.

(1) BASIS OF PRESENTATION

Business

Ribbon Communications Inc. ("Ribbon" or the "Company") is a leading global provider of communications technology to service providers and enterprises. The Company provides a broad range of software and high-performance hardware products, solutions and services that enable the secure delivery of data and voice communications for residential consumers and for small, medium, and large enterprises and industry verticals such as finance, education, government, utilities and transportation. Ribbon's mission is to create a recognized global technology leader providing cloud-centric solutions that enable the secure exchange of information, with unparalleled scale, performance and elasticity. The Company is headquartered in Plano, Texas, and has a global presence with research and development, or sales and support locations in over thirty-five countries around the world.

Basis of Presentation

In the opinion of management, the accompanying unaudited condensed consolidated financial statements include all adjustments, consisting only of normal recurring items, necessary for their fair presentation with accounting principles generally accepted in the United States of America ("GAAP") and with the rules and regulations of the U.S. Securities and Exchange Commission ("SEC").

On December 1, 2020 (the "Kandy Sale Date"), the Company completed the sale of its cloud-based enterprise service business (the "Kandy Communications Business") to AVCT and, accordingly, the revenue and expenses of the Kandy Communications Business are excluded from the Company's condensed consolidated financial statements for the three and nine months ended September 30, 2021.

On March 3, 2020 (the "ECI Acquisition Date"), a subsidiary of the Company merged (the "ECI Acquisition") with ECI Telecom Group Ltd ("ECI"). The financial results of ECI are included in the Company's condensed consolidated financial statements for the period subsequent to the ECI Acquisition Date.

Interim results are not necessarily indicative of results for a full year or any future interim period. The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the Company's Annual Report on Form 10-K for the year ended December 31, 2020 (the "Annual Report"), which was filed with the SEC on February 26, 2021.

Operating Segments

The Company's chief operating decision maker (the "CODM") is its President and Chief Executive Officer. Effective in the fourth quarter of 2020 and in connection with the ECI Acquisition, the CODM began to assess the Company's performance based on the performance of two separate organizations within Ribbon: the Cloud and Edge segment ("Cloud and Edge") and the IP Optical Networks segment ("IP Optical Networks"). Financial information for the IP Optical Networks segment included in the Company's financial results for the nine months ended September 30, 2020 is for the period subsequent to the ECI Acquisition Date through September 30, 2020.

Reclassifications

In the fourth quarter of 2020, the Company reclassified amounts recorded for amortization of acquired intangible assets in prior presentations from Cost of revenue - product and Sales and marketing to a separate line included in operating expenses in the condensed consolidated statements of operations, as management believes this presentation enhances the comparability of the Company's financial statements with industry peers. These reclassifications also did not impact the condensed consolidated balance sheets or statements of cash flows for any historical periods. The Company did not reclassify depreciation of property and equipment related to production activities from cost of revenue to other accounts.

These reclassifications for the three and nine months ended September 30, 2020 were as follows (in thousands):

	Three months ended September 30, 2020			Nine months ended September 30, 2020		
	Prior presentation	Amounts reclassified	Revised presentation	Prior presentation	Amounts reclassified	Revised presentation
Product revenue	$ 128,926		$ 128,926	$ 325,687		$ 325,687
Service revenue	102,192		102,192	273,906		273,906
Total revenue	231,118	—	231,118	599,593	—	599,593
Cost of revenue - product	70,188	(11,643)	58,545	176,650	(31,547)	145,103
Cost of revenue - service	37,619		37,619	105,745		105,745
Total cost of revenue	107,807	(11,643)	96,164	282,395	(31,547)	250,848
Total gross profit	123,311	11,643	134,954	317,198	31,547	348,745
Research and development	49,113		49,113	143,204		143,204
Sales and marketing	41,604	(4,706)	36,898	115,572	(13,805)	101,767
General and administrative	16,021		16,021	48,320		48,320
Amortization of acquired intangible assets	—	16,349	16,349	—	45,352	45,352
Acquisition-, disposal- and integration-related	1,366		1,366	14,607		14,607
Restructuring and related	3,290		3,290	10,726		10,726
Total operating expenses	111,394	11,643	123,037	332,429	31,547	363,976
Income (loss) from operations	$ 11,917	$ —	$ 11,917	$ (15,231)	$ —	$ (15,231)

Certain reclassifications, not affecting previously reported net income (loss), have been made to the previously issued financial statements to conform to the current period presentation.

Significant Accounting Policies

The Company's significant accounting policies are disclosed in Note 2 to the Consolidated Financial Statements included in the Annual Report. There were no material changes to the significant accounting policies during the three months ended September 30, 2021 with the exception of the Company's election to account for its equity investment in AVCT using the fair value option in connection with the September 8, 2021 conversion of the debentures received by the Company as consideration for the sale of its Kandy Communications Business (the "Debentures Conversion") (see Note 3).

Principles of Consolidation

The condensed consolidated financial statements include the accounts of Ribbon and its wholly-owned subsidiaries. Intercompany transactions and balances have been eliminated in consolidation.

Use of Estimates and Judgments

The preparation of financial statements in conformity with GAAP requires Ribbon to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting periods. Significant estimates and judgments relied upon in preparing these condensed consolidated financial statements include accounting for business combinations, revenue recognition for multiple element arrangements, inventory valuations, assumptions used to determine the fair value of stock-based compensation, intangible asset and goodwill valuations, including impairments, legal contingencies and recoverability of Ribbon's net deferred tax assets and the related valuation allowances. Ribbon regularly assesses these estimates and records changes in estimates in the period in which they become known. Ribbon bases its estimates on historical experience and various other assumptions that it believes to be reasonable under the circumstances. Actual results could differ from those estimates.

Restricted Cash

The Company classifies as restricted cash all cash pledged as collateral to secure long-term obligations and all cash whose use is otherwise limited by contractual provisions.

At September 30, 2021, the Company had $2.5 million of restricted cash, representing restricted short-term bank deposits pledged to secure certain performance and financial bonds as security for the Company's obligations under tenders, contracts and to one of its main subcontractors.

At December 31, 2020, the Company had $7.3 million of restricted cash, comprised of $4.6 million restricted in connection with a tax payment on certain fixed assets formerly held by ECI that were sold in connection with the ECI Acquisition, and $2.7 million of restricted short-term bank deposits pledged to secure certain performance and financial bonds as security for the Company's obligations under tenders, contracts and to one of its main subcontractors.

Transfers of Financial Assets

The Company maintains customer receivables factoring agreements with a number of financial institutions primarily for IP Optical Networks sales outside of the United States. Under the terms of these agreements, the Company may transfer receivables to the financial institutions, on a non-recourse basis, provided that the financial institutions approve the receivables in advance. The Company maintains credit insurance policies from major insurance providers or obtains letters of credit from the customers for a majority of its factored trade receivables. The Company accounts for the factoring of its financial assets as a sale of the assets and records the factoring fees, when incurred, as a component of interest expense in the condensed consolidated statements of operations, and the proceeds from the sales of receivables are included in cash from operating activities in the condensed consolidated statements of cash flows. During the three and nine months ended September 30, 2021, the Company received $24.8 million and $88.0 million, respectively, of cash from the sale of certain accounts receivable and recorded $0.2 million and $0.6 million, respectively, of interest expense in connection with these transactions. During the three and nine months ended September 30, 2020, the Company received $35.3 million and $81.1 million, respectively, of cash from the sale of certain accounts receivable and recorded $0.3 million and $0.7 million, respectively, of interest expense in connection with these transactions.

Fair Value of Financial Instruments and Fair Value Hierarchy

The carrying amounts of the Company's financial instruments approximate their fair values and include cash equivalents, accounts receivable, borrowings under a revolving credit facility, accounts payable and long-term debt.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or a liability. The three-tier fair value hierarchy is based on the level of independent, objective evidence surrounding the inputs used to measure fair value. A financial instrument's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. The fair value hierarchy is as follows:

Level 1. Level 1 applies to assets or liabilities for which there are quoted prices in active markets for identical assets or liabilities.

Level 2. Level 2 applies to assets or liabilities for which there are inputs that are directly or indirectly observable in the marketplace, such as quoted prices for similar assets or liabilities in active markets or quoted prices for identical assets or liabilities in markets with insufficient volume or infrequent transactions (less active markets).

Level 3. Level 3 applies to assets or liabilities for which there are unobservable inputs to the valuation methodology that are significant to the measurement of the fair value of the assets or liabilities.

Fair Value Option - Investment in AVCT

In connection with the Debentures Conversion, the Company elected to use the fair value option to account for its equity investment in AVCT as permitted under Accounting Standards Codification ("ASC") 825, *Financial Instruments* ("ASC 825"). ASC 820, *Fair Value Measurement* ("ASC 820") provides the fair value framework for valuing such investments. In accordance with ASC 820, the Company is recording the investment in AVCT at fair value, with changes in fair value recorded as a component of Other (expense) income, net, in the condensed consolidated statements of operations.

Recent Accounting Pronouncements

The Financial Accounting Standards Board ("FASB") issued the following accounting pronouncement which became effective for the Company in 2021, and which did not have a material impact on its condensed consolidated financial statements:

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* ("ASU 2019-12"), which modifies ASC 740 to simplify the accounting for income taxes. ASU 2019-12 addresses the accounting for hybrid tax regimes, tax basis step-up in goodwill obtained in a transaction that is not a business combination, separate financial statements of legal entities not subject to tax, intraperiod tax allocation exception to incremental approach, ownership changes in investments - changes from a subsidiary to an equity method investment, ownership changes in investments - changes from an equity method investment to a subsidiary, interim period accounting for enacted changes in tax law and year-to-date loss limitation in interim period tax accounting.

The FASB issued the following accounting pronouncement, which the Company does not believe will have a material impact on its condensed consolidated financial statements upon adoption:

In January 2021, the FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848): Scope* ("ASU 2021-01"), which refines the scope of Accounting Standards Codification 848, *Reference Rate Reform* ("ASC 848") and clarifies some of its guidance as part of the FASB's monitoring of global reference rate reform activities. ASU 2021-01 permits entities to elect certain optional expedients and exceptions when accounting for derivative contracts and certain hedging relationships affected by changes in the interest rates used for discounting cash flows, for computing variation margin settlements, and for calculating price alignment interest in connection with reference rate reform activities under way in global financial markets (the "discounting transition"). ASU 2021-01 is effective for the Company prospectively in any period through December 31, 2022 that a modification is made to the terms of the derivatives affected by the discounting transition.

(2) BUSINESS ACQUISITION

On the ECI Acquisition Date, Ribbon completed its previously announced merger transaction with ECI in accordance with the terms of the Agreement and Plan of Merger, dated as of November 14, 2019, by and among Ribbon, ECI, an indirect wholly-owned subsidiary of Ribbon ("Merger Sub"), Ribbon Communications Israel Ltd. and ECI Holding (Hungary) kft, pursuant to which Merger Sub merged with and into ECI, with ECI surviving such merger as a wholly-owned subsidiary of Ribbon. Prior to the ECI Acquisition Date, ECI was a privately-held global provider of end-to-end packet-optical transport and software-defined networking ("SDN") and network function virtualization ("NFV") solutions for service providers, enterprises and data center operators.

As consideration for the ECI Acquisition, Ribbon issued the ECI shareholders and certain others 32.5 million shares of Ribbon common stock with a fair value of $108.6 million (the "Stock Consideration") and paid $322.5 million of cash (the "Cash Consideration"), comprised of $183.3 million to repay ECI's outstanding debt, including both principal and interest, and $139.2 million paid to ECI's selling shareholders. In addition, ECI shareholders received $33.4 million from the sale of certain of ECI's real estate assets. Cash Consideration was financed through cash on hand and committed debt financing consisting of a new $400 million term loan facility and new $100 million revolving credit facility, which was undrawn at the ECI Acquisition Date.

The ECI Acquisition has been accounted for as a business combination and the financial results of ECI have been included in the Company's condensed consolidated financial statements for the periods subsequent to the ECI Acquisition. The Company's financial results for the three months ended September 30, 2020 included $77.6 million of revenue and $11.2 million of net loss attributable to ECI. The Company's financial results for the nine months ended September 30, 2020 included $171.1 million of revenue and $31.9 million of net loss attributable to ECI for the period subsequent to the ECI Acquisition.

The Company finalized the valuation of acquired assets, identifiable intangible assets and certain assumed liabilities in the fourth quarter of 2020. A summary of the allocation of the purchase consideration for ECI is as follows (in thousands):

Fair value of consideration transferred:		
Cash consideration:		
Repayment of ECI outstanding debt obligations	$	183,
Cash paid to selling shareholders		139,
Payment to selling shareholders from sale of ECI real estate assets		33,
Less cash and restricted cash acquired		(9,
Net cash consideration		346,
Fair value of Ribbon stock issued		108,
Fair value of total consideration	$	455,
Fair value of assets acquired and liabilities assumed:		
Current assets, net of cash and restricted cash acquired	$	120,
Property and equipment		54,
Intangible assets:		
In-process research and development		34,
Developed technology		111,
Customer relationships		116,
Trade names		3,
Goodwill		191,
Other noncurrent assets		37,
Deferred revenue		(4,
Other current liabilities		(146,
Deferred revenue, net of current		(3,
Deferred tax liability		(13,
Other long-term liabilities		(46,
	$	455,

The valuation of the acquired intangible assets is inherently subjective and relies on significant unobservable inputs. The Company used an income approach to value the acquired in-process research and development, developed technology, customer relationships and trade name intangible assets. The valuation for each of these intangible assets was based on estimated projections of expected cash flows to be generated by the assets, discounted to the present value at discount rates commensurate with perceived risk. The valuation assumptions take into consideration the Company's estimates of customer attrition, technology obsolescence and revenue growth projections. The Company is amortizing the identifiable intangible assets arising from the ECI Acquisition in relation to the expected cash flows from the individual intangible assets over their respective useful lives, which have a weighted average life of 12.38 years (see Note 6). Goodwill results from assets that are not separately identifiable as part of the transaction and is not deductible for tax purposes.

Pro Forma Results

The following unaudited pro forma information presents the condensed combined results of operations of Ribbon and ECI for the three and nine months ended September 30, 2020 as if the ECI Acquisition had been completed on January 1, 2019, with adjustments to give effect to pro forma events that are directly attributable to the ECI Acquisition. These pro forma adjustments include an increase in research and development expense related to the conformance of ECI's cost capitalization policy to

Ribbon's, additional amortization expense for the acquired identifiable intangible assets, a decrease in historical ECI interest expense reflecting the extinguishment of certain of ECI's debt as a result of the ECI Acquisition, and an increase in interest expense reflecting the new debt entered into by the Company in connection with the ECI Acquisition. Pro forma adjustments also include the elimination of acquisition-, disposal- and integration-related expenses directly attributable to the acquisition from the three and nine months ended September 30, 2020 and inclusion of such costs in the comparable prior year periods.

The unaudited pro forma results do not reflect any operating efficiencies or potential cost savings that may result from the consolidation of the operations of Ribbon and ECI. Accordingly, these unaudited pro forma results are presented for illustrative purposes and are not intended to represent or be indicative of the actual results of operations of the combined company that would have been achieved had the ECI Acquisition occurred at January 1, 2019, nor are they intended to represent or be indicative of future results of operations (in thousands, except per share amounts):

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	Three months ended September 30, 2020	Nine months ended September 30, 2020
Revenue	$ 231,118	$ 624,800
Net income (loss)	$ 7,036	$ (41,345)
Diluted earnings (loss) per share	$ 0.05	$ (0.29)

Acquisition-, Disposal- and Integration-Related Expenses

Acquisition-related expenses include those expenses related to acquisitions that would otherwise not have been incurred by the Company, including professional and services fees, such as legal, audit, consulting, paying agent and other fees. Disposal-related expenses are professional and services fees related to disposals of subsidiaries or portions of the business. Integration-related expenses represent incremental costs related to combining the Company and its business acquisitions, such as third-party consulting and other third-party services related to merging the previously separate companies' systems and processes. The acquisition-related expenses in the three and nine months ended September 30, 2020 primarily related to the ECI Acquisition. The disposal-related expenses in the nine months ended September 30, 2021 relate to the Kandy Sale (as defined below).

The Company's acquisition-, disposal- and integration-related expenses for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Professional and services fees (acquisition-related)	$ 13	$ 1,003	$ 156	$ 14,017
Professional and services fees (disposal-related)	—	—	241	—
Integration-related expenses	1,942	363	3,807	590
	$ 1,955	$ 1,366	$ 4,204	$ 14,607

(3) SALE OF KANDY COMMUNICATIONS BUSINESS AND INVESTMENT IN AVCT

On August 5, 2020, the Company announced that it had entered into a definitive agreement (as amended, the "Kandy Purchase Agreement") with AVCT to sell the Kandy Communications Business. Under the Kandy Purchase Agreement, AVCT agreed to purchase the assets and assume certain liabilities associated with the Kandy Communications Business, as well as all of the outstanding interests in Kandy Communications LLC, a subsidiary of the Company (the "Kandy Sale").

On December 1, 2020, the Company completed the Kandy Sale. The assets acquired and liabilities assumed by AVCT in connection with the Kandy Sale were primarily comprised of accounts receivable, property and equipment, trade accounts payable and employee-related accruals. As consideration, AVCT paid Ribbon $45.0 million, subject to certain adjustments, in the form of units of AVCT's securities (the "AVCT Units"), with each AVCT Unit consisting of: $1,000 in principal amount of AVCT's Series A-1 convertible debentures (the "Debentures"); and (ii) one warrant to purchase 100 shares of AVCT common stock, $0.0001 par value (the "Warrants"), as consideration for the Kandy Sale. The Company received 43,778 AVCT Units as consideration on the Kandy Sale Date.

The Debentures bore interest at a rate of 10% per annum, which was added to the principal amount of the Debentures. The entire principal amount of each Debenture, together with accrued and unpaid interest thereon, was due and payable on the earlier of the May 1, 2023 maturity date or the occurrence of a Change in Control as defined in the Kandy Purchase Agreement. Each Debenture was convertible, in whole or in part, at any time at the Company's option into that number of shares of AVCT common stock, calculated by dividing the principal amount being converted, together with all accrued and unpaid interest thereon, by the applicable conversion price, which initially was $3.45 per share. The Debentures were subject to mandatory conversion if the AVCT stock price was at or above $6.00 per share for 40 trading days in any 60 consecutive trading day period, subject to the satisfaction of certain other conditions. The conversion price was subject to customary adjustments including, but not limited to, stock dividends, stock splits and reclassifications. As of February 19, 2021, the stock price had traded above $6.00 for 40 days within a 60 consecutive trading day period, and accordingly, on September 8, 2021 (the "Debenture Conversion Date"), upon the completion of customary regulatory filings by AVCT, the Debentures were converted into 13,700,421 shares of AVCT common stock (the "Debenture Shares").

The Warrants were independent of the Debentures and entitle the Company to purchase 4,377,800 shares of AVCT common stock at an exercise price of $0.01 per share. The Warrants expire on December 1, 2025, and were immediately exercisable on the Kandy Sale Date. The Company had not exercised any of the Warrants as of September 30, 2021. The Company was also subject to a lock-up provision which limited the Company's ability to sell any shares of the AVCT common stock underlying the Debentures and the Warrants prior to June 1, 2021 (the "Lock-Up Period"), except in certain transactions.

The Company determined that the AVCT Units had a fair value of $84.9 million at the Kandy Sale Date, comprised of the Debentures with a fair value of $66.3 million and the Warrants with a fair value of $18.6 million. The value of the net assets sold to AVCT totaled $1.3 million, resulting in a gain on the sale of $83.6 million. The Company calculated the fair value of the Debentures using a Lattice-based valuation approach, which utilizes a binomial tree to model the different paths the price of AVCT's common stock might take over the Debentures' life by using assumptions regarding the stock price volatility and risk-free interest rate. These results were then used to calculate the fair value of the Debentures at each measurement date prior to the Debenture Conversion Date. The Company used the Black-Scholes valuation model for estimating the fair value of the Warrants at each measurement date. The fair value of the Warrants was affected by AVCT's stock price as well as valuation assumptions, including the volatility of AVCT's stock price, expected term of the option, risk-free interest rate and expected dividends. Both the Lattice and Black-Scholes valuation models are based on available market data, giving consideration to all of the rights and obligations of each instrument and precluding the use of "blockage" discounts or premiums in determining the fair value of a large block of financial instruments. After the expiration of the Lock-Up Period and prior to the Debenture Conversion Date, the Company valued the AVCT Units at each measurement date by multiplying the closing stock price of AVCT common stock by the number of shares upon conversion of the Debentures and Warrants. At September 30, 2021, the Company valued the Debenture Shares and Warrants by multiplying the closing stock price of AVCT common stock by the number of Debenture Shares and Warrants (collectively, the "AVCT Investment") it held.

At September 30, 2021, the aggregate fair value of the AVCT Investment was $50.4 million, comprised of $38.2 million for the Debenture Shares and $12.2 million for the Warrants. At December 31, 2020, the aggregate fair value of the AVCT Units was $115.2 million. The Company recorded losses of $56.5 million and $68.3 million in the three and nine months ended September 30, 2021, respectively, arising from the change in the aggregate fair value of the AVCT Investment. These amounts are included as components of Other income (expense), net, in the Company's condensed consolidated statements of operations. The Company recorded $0.9 million and $3.6 million of interest income in the three and nine months ended September 30, 2021, respectively, which was added to the principal amount of the Debentures prior to the Debenture Conversion Date, and which is included in Interest expense, net, in the condensed consolidated statements of operations. The fair value of the AVCT Investment at September 30, 2021 and the fair values of the Debentures and Warrants at December 31, 2021 are reported as Investments in the Company's condensed consolidated balance sheets. The AVCT Investment is classified as a Level 1 fair value measurement at September 30, 2021 and the Debentures and Warrants are classified as Level 2 fair value measurements within the fair value hierarchy at December 31, 2020 (see Note 1).

The Company evaluated the nature of its investment in AVCT for the period from the Debenture Conversion Date to September 30, 2021 and determined that it represented an approximate 25% equity interest in AVCT. The Company determined that it is not the primary beneficiary of AVCT as it does not have the power to direct the activities that most significantly impact the AVCT Investment's economic performance and therefore concluded that, although it did have significant influence arising from the AVCT Investment, it did not have a controlling financial interest that would require consolidation as of September 30, 2021.

(4) EARNINGS (LOSS) PER SHARE

Basic earnings (loss) per share is computed by dividing net income (loss) by the weighted average number of shares outstanding during the period. For periods in which the Company reports net income, diluted net earnings per share is determined by using the weighted average number of common and dilutive common equivalent shares outstanding during the period, unless the effect is antidilutive.

The calculations of shares used to compute earnings (loss) per share were as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Weighted average shares outstanding - basic	148,184	144,948	147,204	136,837
Potential dilutive common shares	—	6,732	—	—
Weighted average shares outstanding - diluted	148,184	151,680	147,204	136,837

Options to purchase the Company's common stock and unvested restricted and performance-based stock units aggregating 10.9 million shares have not been included in the computation of diluted earnings per share for the three and nine months ended September 30, 2021 because their effect would have been antidilutive. Options to purchase the Company's common stock aggregating 0.2 million shares have not been included in the computation of diluted earnings per share for the three months ended September 30, 2020 because their effect would have been antidilutive. Options to purchase the Company's common stock and unvested shares of restricted and performance-based stock and stock units aggregating 13.5 million shares have not been included in the computation of diluted loss per share have not been included in the computation of diluted loss per share for the nine months ended September 30, 2020 because their effective would have been antidilutive.

(5) INVENTORY

Inventory at September 30, 2021 and December 31, 2020 consisted of the following (in thousands):

	September 30, 2021	December 31, 2020
On-hand final assemblies and finished goods inventories	$ 48,176	$ 46,921
Deferred cost of goods sold	1,467	1,165
	49,643	48,086
Less noncurrent portion (included in other assets)	(4,854)	(2,336)
Current portion	$ 44,789	$ 45,750

(6) INTANGIBLE ASSETS AND GOODWILL

The Company's intangible assets at September 30, 2021 and December 31, 2020 consisted of the following (in thousands):

September 30, 2021	Weighted average amortization period (years)	Cost	Accumulated amortization	Net carrying value
In-process research and development	*	$ 34,000	$ —	$ 34,000
Developed technology	7.93	306,380	172,485	133,895
Customer relationships	11.86	268,140	70,464	197,676
Trade names	3.88	5,000	3,440	1,560
Internal use software	3.00	730	730	—
	9.17	$ 614,250	$ 247,119	$ 367,131

December 31, 2020	Weighted average amortization period (years)	Cost	Accumulated amortization	Net carrying value
In-process research and development	*	$ 34,000	$ —	$ 34,000
Developed technology	7.93	306,380	143,050	163,330
Customer relationships	11.86	268,140	50,627	217,513
Trade names	3.88	5,000	2,487	2,513
Internal use software	3.00	730	730	—
	9.17	$ 614,250	$ 196,894	$ 417,356

* An in-process research and development intangible asset has an indefinite life until the product is generally available, at which time such asset is typically reclassified to developed technology.

Estimated future amortization expense for the Company's intangible assets at September 30, 2021 was as follows (in thousands):

Years ending December 31,	
Remainder of 2021	$ 16,401
2022	60,449
2023	53,966
2024	46,899
2025	40,338
2026	36,489
Thereafter	112,589
	$ 367,131

There were no changes to the carrying value of the Company's goodwill in the nine months ended September 30, 2021. The changes in the carrying value of the Company's goodwill in the nine months ended September 30, 2020 were as follows (in thousands):

	Cloud and Edge		IP Optical Networks		Total	
Balance at January 1, 2020*	$	224,896	$	—	$	224,8
Acquisition of ECI		—		191,996		191,9
Balance at September 30, 2020	$	224,896	$	191,996	$	416,8

* Balance is presented net of accumulated impairment losses of $167.4 million for the Cloud and Edge segment.

The components of goodwill at September 30, 2021 and 2020 were as follows (in thousands):

	Cloud and Edge		IP Optical Networks		Total	
Balance at September 30, 2021						
Goodwill	$	392,302	$	191,996	$	584,298
Accumulated impairment losses		(167,406)		—		(167,406)
	$	224,896	$	191,996	$	416,892
Balance at September 30, 2020						
Goodwill	$	392,302	$	191,996	$	584,298
Accumulated impairment losses		(167,406)		—		(167,406)
	$	224,896	$	191,996	$	416,892

(7) ACCRUED EXPENSES AND OTHER

Accrued expenses at September 30, 2021 and December 31, 2020 consisted of the following (in thousands):

	September 30, 2021		December 31, 2020	
Employee compensation and related costs	$	38,730	$	66,039
Other		55,291		68,826
	$	94,021	$	134,865

(8) WARRANTY ACCRUALS

The changes in the Company's accrual balance in the nine months ended September 30, 2021 were as follows (in thousands):

Balance at January 1, 2021	$	14,855
Current period provisions		1,925
Settlements		(4,095)
Balance at September 30, 2021	$	12,685

Of the amounts recorded at September 30, 2021 and December 31, 2020, $5.8 million and $6.5 million, respectively, were current and included as components of Accrued expenses and other, and $6.9 million and $8.4 million, respectively, were long-term and included as components of Other long-term liabilities in the Company's condensed consolidated balance sheets.

(9) RESTRUCTURING AND FACILITIES CONSOLIDATION INITIATIVES

Restructuring and related expense includes both restructuring expense for severance and related costs and facilities-related costs, primarily comprised estimated future variable lease costs for vacated properties with no intent or ability of sublease, and accelerated rent amortization expense.

For restructuring events that involve lease assets and liabilities, the Company applies lease reassessment and modification guidance and evaluates the right-of-use assets for potential impairment. If the Company plans to exit all or distinct portions of a facility and does not have the ability or intent to sublease, the Company will accelerate the amortization of each of those lease components through the vacate date. The accelerated amortization is recorded as a component of Restructuring and related expense in the Company's condensed consolidated statements of operations. Related variable lease expenses will continue to be expensed as incurred through the vacate date, at which time the Company will reassess the liability balance to ensure it appropriately reflects the remaining liability associated with the premises and record a liability for the estimated future variable lease costs.

Restructuring and related expense for the three and nine months ended September 30, 2021 and 2020 was comprised of the following (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Severance and related costs	$ 481	$ 1,789	$ 3,076	$ 8,276
Variable and other facilities-related costs	1,286	$ 1,501	4,103	2,380
Accelerated amortization of lease assets due to cease-use	—	$ —	3,368	70
	$ 1,767	$ 3,290	$ 10,547	$ 10,726

Accelerated Rent Amortization

Accelerated rent amortization is recognized from the date that the Company commences the plan to fully or partially vacate a facility, for which there is no intent or ability to enter into a sublease, through the final vacate date. The accelerated rent amortization recorded in connection with the Facilities Initiative reduced the value of the Company's Operating lease right-of-use assets recorded in the Company's condensed consolidated balance sheets at September 30, 2021 and December 31, 2020, respectively. The liability for the total lease payments for each respective facility is included as a component of Operating lease liabilities in the Company's condensed consolidated balance sheets, both current and noncurrent (see Note 17). The Company may incur additional future expense if it is unable to sublease other locations included in its restructuring initiatives.

2020 Restructuring Initiative

In 2020, the Company implemented a restructuring plan to eliminate certain positions and redundant facilities, primarily in connection with the ECI Acquisition, to further streamline the Company's global footprint and improve its operations (the "2020 Restructuring Initiative"). In connection with this initiative, the Company expects to eliminate duplicate functions arising from the ECI Acquisition and support its efforts to integrate the two companies.

The Company recorded restructuring and related expense of $0.6 million and $2.9 million in connection with the 2020 Restructuring Initiative in the three months ended September 30, 2021 and 2020, respectively, and $2.9 million and $8.7 million in the nine months ended September 30, 2021 and 2020, respectively.

The amount recorded in the three months ended September 30, 2021 was comprised of $0.5 million for severance and related costs for approximately 10 employees and $0.1 million for costs related to restructured facilities. The amount recorded in the nine months ended September 30, 2021 was comprised of $3.1 million for severance and related costs for approximately 30 employees and $0.5 million of expense for variable and other costs related to restructured facilities, offset by a credit of $0.7 million for changes in estimate to previously recorded facilities-related amounts. The amount recorded in the nine months ended September 30, 2020 represents severance and related costs for approximately 125 employees.

The Company expects the amount accrued for severance at September 30, 2021 will be paid in 2021. The Company expects that it will record additional restructuring and related expense approximating $1 million under the 2020 Restructuring Initiative in the aggregate for severance and planned facility consolidations. A summary of the 2020 Restructuring Initiative accrual activity for severance and related costs for the nine months ended September 30, 2021 is as follows (in thousands):

	Balance at January 1, 2021	Initiatives charged to expense	Adjustments for changes in estimate	Cash payments	Balance at September 30, 2021
Severance	$ 5,237	$ 3,076	$ —	$ (5,921)	$ 2,392
Facilities	1,256	473	(670)	(1,059)	—
	$ 6,493	$ 3,549	$ (670)	$ (6,980)	$ 2,392

2019 Restructuring and Facilities Consolidation Initiative

In June 2019, the Company implemented a restructuring plan to further streamline the Company's global footprint, improve its operations and enhance its customer delivery (the "2019 Restructuring Initiative"). The 2019 Restructuring Initiative includes facility consolidations, refinement of the Company's research and development activities, and a reduction in workforce. The facility consolidations under the 2019 Restructuring Initiative (the "Facilities Initiative") include a consolidation of the Company's North Texas sites into a single campus, housing engineering, customer training and support, and administrative functions, as well as a reduction or elimination of certain excess and duplicative facilities worldwide. In addition, the Company is substantially consolidating its global software laboratories and server farms into two lower cost North American sites. The Company continues to evaluate its properties included in the Facilities Initiative for accelerated amortization and/or right-of-use asset impairment. The Company expects that the actions under the Facilities Initiative will be completed in 2021.

In connection with the 2019 Restructuring Initiative, the Company recorded restructuring and related expense of $1.2 million and $0.4 million in the three months ended September 30, 2021 and 2020, respectively, and $7.7 million and $2.1 million in the nine months ended September 30, 2021 and 2020, respectively.

The amount recorded in the three months ended September 30, 2021 was for facilities-related costs. Of the amount recorded in the nine months ended September 30, 2021, $3.4 million was for accelerated amortization of lease assets and $4.3 million related to variable and other facilities-related costs in connection with facility consolidations. The amount recorded in the three months ended September 30, 2020 primarily related to facility consolidations. The amount recorded in the nine months ended September 30, 2020 was comprised of $0.6 million for severance and related costs for five employees and $1.5 million related to facility consolidations. These amounts include nominal credits to restructuring and related expense in the three and nine months ended September 30, 2020, representing changes in estimate for both severance and related expenses and facilities-related expenses. The Company estimates that it will record nominal, if any, additional restructuring and related expense in connection with this initiative.

A summary of the 2019 Restructuring Initiative accrual activity for the nine months ended September 30, 2021 is as follows (in thousands):

	Balance at January 1, 2021	Initiatives charged to expense	Reclassify accelerated amortization to operating lease liabilities	Cash payments	Balance at September 30, 2021
Severance	$ 173	$ —	$ —	$ (173)	$ —
Facilities	766	7,668	(3,368)	(3,301)	1,765
	$ 939	$ 7,668	$ (3,368)	$ (3,474)	$ 1,765

Balance Sheet Classification

The current portions of accrued restructuring are included as a component of Accrued expenses and the long-term portions of accrued restructuring are included as a component of Other long-term liabilities in the condensed consolidated balance sheets. The long-term portions of accrued restructuring relate to facilities and totaled $1.8 million at September 30, 2021 and $0.8 million at December 31, 2020.

(10) DEBT

2020 Credit Facility

On March 3, 2020, the Company entered into a Senior Secured Credit Facilities Credit Agreement (as amended, the "2020 Credit Facility"), by and among the Company, as a guarantor, Ribbon Communications Operating Company, Inc., as the borrower ("Borrower"), Citizens Bank, N.A. ("Citizens"), as administrative agent, a lender, issuing lender, swingline lender, joint lead arranger and bookrunner, Santander Bank, N.A., as a lender, joint lead arranger and bookrunner, and the other lenders party thereto (each, together with Citizens Bank, N.A. and Santander Bank, N.A., referred to individually as a "Lender", and collectively, the "Lenders"). The proceeds of the 2020 Credit Facility were used, in part, to pay off in full all obligations of the Company under its prior credit facility (the "2019 Credit Facility").

The 2020 Credit Facility provides for $500 million of commitments from the lenders to the Borrower, comprised of $400 million in term loans (the "2020 Term Loan Facility") and a $100 million facility available for revolving loans (the "2020 Revolving Credit Facility"). Under the 2020 Revolving Credit Facility, a $30 million sublimit is available for letters of credit and a $20 million sublimit is available for swingline loans. Under the 2020 Credit Facility, the Company was originally required to make quarterly principal payments aggregating approximately $10 million in the first year, $20 million per year for the following three years, and $30 million in the last year, with the remaining balance due on the maturity date. The 2020 Credit Facility also requires periodic interest payments until maturity.

The indebtedness and other obligations under the 2020 Credit Facility are unconditionally guaranteed on a senior secured basis by the Company, Edgewater Networks, Inc., a wholly-owned subsidiary of the Company, and GENBAND Inc., a wholly-owned subsidiary of the Company (together, the "Guarantors"). The facilities under the 2020 Credit Facility are secured by first-priority liens on substantially all of the assets of the Borrower and the Guarantors, including substantially all of the assets of the Company.

The 2020 Credit Facility requires compliance with certain financial covenants, including a minimum Consolidated Fixed Charge Coverage Ratio and a maximum Consolidated Net Leverage Ratio (each as defined in the 2020 Credit Facility, and each tested on a quarterly basis).

In addition, the 2020 Credit Facility contains various covenants that, among other restrictions, limit the Company’s and its subsidiaries’ ability to incur or assume indebtedness; grant or assume liens; make acquisitions or engage in mergers; sell, transfer, assign or convey assets; repurchase equity and make dividend and certain other restricted payments; make investments; engage in transactions with affiliates; enter into sale and leaseback transactions; enter into burdensome agreements; change the nature of its business; modify their organizational documents; and amend or make prepayments on certain junior debt.

The 2020 Credit Facility contains events of default that are customary for a secured credit facility. If an event of default relating to bankruptcy or other insolvency events with respect to the Company or any of its subsidiaries occurs, all obligations under the 2020 Credit Facility will immediately become due and payable. If any other event of default occurs under the 2020 Credit Facility, the lenders may accelerate the maturity of the obligations outstanding under the Credit Facility and exercise other rights and remedies, including charging a default rate of interest equal to 2.00% per year above the rate that would otherwise be applicable. In addition, if any event of default exists under the 2020 Credit Facility, the lenders can commence foreclosure or other actions against the collateral.

On August 18, 2020 (the "First Amendment Effective Date"), the Borrower entered into a First Amendment to the 2020 Credit Facility (the "First Amendment"). Pursuant to an assignment and assumption agreement entered into by Citizens and certain affiliates of Whitehorse Capital on the First Amendment Effective Date (collectively, "HIG Whitehorse"), and consented to by Citizens and the Borrower, $75 million of the 2020 Term Loan Facility, designated as the Term B Loan (the "Term B Loan"), was assigned from Citizens to HIG Whitehorse. The remaining $325 million of the 2020 Term Loan Facility that was not assigned to HIG Whitehorse was deemed the Term A Loan (the "Term A Loan" and, together with the Term B Loan, the "Amended 2020 Term Loan Facility").

The Term A Loan and the 2020 Revolving Credit Facility mature in March 2025. The Term A Loan and 2020 Revolving Credit Facility bear interest at the Borrower's option at either the LIBOR rate plus a margin ranging from 1.50% to 3.50% per year, or the base rate (the highest of the Federal Funds Effective Rate (as defined in the 2020 Credit Facility) plus 0.50%, or the prime rate announced from time to time in The Wall Street Journal) plus a margin ranging from 0.50% to 2.50% per year (the "Applicable Margin"). The Applicable Margin varies depending on the Company's Consolidated Net Leverage Ratio (as defined in the 2020 Credit Agreement). The base rate and the LIBOR rate are each subject to a zero percent floor. The Company was required to make quarterly principal payments on the Term A Loan aggregating approximately $10 million in the first year, $16 million per year in each of the next two years, $20 million in the fourth year and $16 million in the last year, with the final payment approximating $244 million due on the maturity date. The Borrower could prepay all amounts under the Term A Loan and the 2020 Revolving Credit Facility at any time without premium or penalty (other than customary LIBOR breakage costs), subject to certain notice requirements.

The Term B Loan was scheduled to mature in March 2026 and bore interest, at the Borrower's option, at either the LIBOR rate plus a margin of 7.50% per year, or the base rate (the highest of the Federal Funds Effective Rate (as defined in the First Amendment) plus 0.50%, or the prime rate announced from time to time in The Wall Street Journal, plus a margin of 6.50% per year. The Term B Loan had a lower rate of amortization than the Term A Loan and was subject to a 1.0% premium if voluntarily repaid in connection with a repricing transaction (as defined in the 2020 Credit Facility) occurring prior to the six month anniversary of the First Amendment Effective Date. The Company was required to make quarterly principal payments totaling approximately $1 million in the first year and $8 million in the aggregate over the next four and a half years, with the final payment approximating $66 million.

The First Amendment reduced the Borrower's ability to incur new tranches of term loans, or increases in commitments under the Amended 2020 Term Loan Facility or the 2020 Revolving Credit Facility. Specifically, such indebtedness could be incurred up to an aggregate dollar amount equal to 75% of the Company's Consolidated Adjusted EBITDA (as defined in the 2020 Credit Facility), reduced from 100% prior to the First Amendment, as of the most recently ended fiscal quarter for which financial statements had been delivered to the lenders, plus additional amounts, so long as the Borrower's Consolidated Net Leverage Ratio (as defined in the 2020 Credit Agreement) did not exceed 2.25:1.00, reduced from 2.75:1.00 under the 2020 Credit Agreement. The First Amendment also reduced the amount of Unrestricted Cash (as defined in the 2020 Credit Agreement) used in calculating the Borrower's Consolidated Net Leverage Ratio from $25 million to $10 million.

On December 1, 2020, the Borrower entered into a Second Amendment to the 2020 Credit Facility to obtain consent for an equity exchange with AVCT in connection with the Kandy Sale, as well as to amend certain other provisions of the 2020 Credit Facility.

At December 31, 2020, the Company had an outstanding Term A Loan balance of $318.5 million at an average interest rate of 3.4%, and an outstanding Term B Loan balance of $74.6 million at an average interest rate of 8.4%. The 2020 Revolving Credit Facility did not have an outstanding balance but had $5.6 million of letters of credit outstanding with an interest rate of 2.5%.

On March 3, 2021 (the "Third Amendment Effective Date"), the Company, the Borrower and certain of its subsidiaries entered into a Third Amendment to Credit Agreement (the "Third Amendment"), which further amended the 2020 Credit Facility. The Third Amendment provided for an incremental term loan facility to the Borrower in the original principal amount of $74.6 million, the proceeds of which were used on the Third Amendment Effective Date to consummate an open market purchase of all outstanding amounts under the Term B Loan. Upon the consummation of the open market purchase, the Term B Loans were assigned to the Borrower and immediately cancelled, such that the outstanding amount under the Term A Loan and incremental term loan facility were combined and held by the Lenders (the "2020 Term Loan") with the same terms as the Term A Loan. The Company wrote off $2.5 million of capitalized debt issuance costs in connection with the Third Amendment, which is included in Interest expense, net, in the Company's condensed consolidated statement of operations for the nine months ended September 30, 2021. The Company is required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $20 million per year in the first three years and $30 million in the fourth year, with the final payment approximating $300 million due on the maturity date.

The Third Amendment increased the Borrower's ability to incur new incremental revolving commitments or term loans. Such indebtedness can be incurred up to an aggregate dollar limit equal to 100% of the Company's Consolidated Adjusted

EBITDA (as defined in the 2020 Credit Facility) as of the most recently ended fiscal quarter for which financial statements have been delivered to the Lenders, plus additional amounts, so long as the Borrower's Consolidated Net Leverage Ratio (as defined in the Credit Agreement) does not exceed 2.75:1.00, increased from 2.25:1.00 under the First Amendment. The Third Amendment also increased the amount of Unrestricted Cash (as defined in the 2020 Credit Facility) used in calculating the Borrower's Consolidated Net Leverage Ratio from $10.0 million to $25.0 million.

At September 30, 2021, the Company had an outstanding 2020 Term Loan balance of $380.5 million at an average interest rate of 2.90% and $5.9 million of letters of credit outstanding with an interest rate of 2.00%.

The Company was in compliance with all covenants of the 2020 Credit Facility at both September 30, 2021 and December 31, 2020.

Short-Term Loans

From time to time, the Company enters into uncommitted and unsecured short-term loans to finance exports in China. The Company did not have any such short-term loans outstanding at September 30, 2021 and December 31, 2020.

Letters of Credit and Performance and Bid Bonds

The Company uses letters of credit, performance and bid bonds in the course of its business. At September 30, 2021, the Company had bank guarantees, performance and bid bonds under various uncommitted facilities (collectively, the "Guarantees") aggregating $24.8 million, and $5.9 million of letters of credit under the 2020 Credit Facility (the "Letters of Credit"). At December 31, 2020, the Company had Guarantees aggregating $27.0 million and $5.6 million of Letters of Credit. At September 30, 2021 and December 31, 2020, the Company had cash collateral of $2.5 million and $2.7 million, respectively, supporting the Guarantees, which are included in Restricted cash in the condensed consolidated balance sheets.

(11) DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES

The Company is exposed to financial market risk related to foreign currency fluctuations and changes in interest rates. These exposures are actively monitored by management. To manage the volatility related to the exposure to changes in interest rates, the Company has entered into a derivative financial instrument. Management's objective is to reduce, where it is deemed appropriate to do so, fluctuations in earnings and cash flows associated with changes in interest rates. Ribbon's policies and practices are to use derivative financial instruments only to the extent necessary to manage exposures. Ribbon does not hold or issue derivative financial instruments for trading or speculative purposes.

The Company records derivatives on the balance sheet at fair value. The accounting for changes in the fair value of derivatives depends on the intended use of the derivative, whether the Company has elected to designate a derivative in a hedging relationship and apply hedge accounting and whether the hedging relationship has satisfied the criteria necessary to apply hedge accounting. Derivatives designated and qualifying as a hedge of the exposure to changes in the fair value of an asset, liability, or firm commitment attributable to a specific risk, such as interest rate risk, are considered fair value hedges. Derivatives designated and qualifying as a hedge of the exposure to variability in expected future cash flows, or other types of forecasted transactions, are considered cash flow hedges. Derivatives may also be designated as hedges of the foreign currency exposure of a net investment in a foreign operation. Hedge accounting generally provides for the matching of the timing of gain or loss recognition on the hedging instrument with the recognition of the changes in the fair value of the hedged asset or liability that are attributable to the hedged risk in a fair value hedge, or the earnings effect of the hedged forecasted transactions in a cash flow hedge. The Company may enter into derivative contracts that are intended to economically hedge certain of its risk even though hedge accounting does not apply or the Company elects not to apply hedge accounting.

Cash Flow Hedge of Interest Rate Risk

The 2020 Term Loan Facility had outstanding balances of $380.5 million and $393.1 million at September 30, 2021 and December 31, 2020, respectively. The 2020 Revolving Credit Facility was undrawn at both September 30, 2021 and December 31, 2020. Borrowings under the 2020 Credit Facility have variable interest rates based on LIBOR (see Note 10). As a result of exposure to interest rate movements, during March 2020, the Company entered into an interest rate swap arrangement, which effectively converted its $400 million term loan with its variable interest rate based upon one-month LIBOR to an aggregate fixed rate of 0.904%, plus a leverage-based margin as defined in the 2020 Credit Facility. The notional amount of this swap at September 30, 2021 was $400 million, and the swap matures on March 3, 2025, the same date the 2020 Credit Facility matures.

The Company's objectives in using interest rate derivatives are to add stability to interest expense and to manage its exposure to interest rate movements. To accomplish this objective, the Company is using an interest rate swap as part of its interest rate risk management strategy. Interest rate swaps designated as cash flow hedges involve the receipt of variable amounts from a counterparty in exchange for the Company making fixed-rate payments over the life of the agreements without exchange of the underlying notional amount.

The effective portion of changes in the fair value of designated derivatives that qualify as cash flow hedges is recorded in accumulated other comprehensive income (loss) in the condensed consolidated balance sheet and is subsequently reclassified into earnings in the period that the hedged forecasted transactions affect earnings. During the three and nine months ended September 30, 2021 and 2020, such a derivative was used to hedge the variable cash flows associated with the outstanding borrowings under the 2020 Credit Facility and the Company has accounted for this derivative as an effective hedge. Any ineffective portion of the change in the fair value of the derivative would be recognized directly in earnings.

Amounts reported in accumulated other comprehensive income (loss) related to the Company's derivative are reclassified to interest expense as interest is accrued on the Company's variable-rate debt. Based upon projected forward rates, the Company estimates as of September 30, 2021 that $3.2 million may be reclassified as an increase to interest expense over the next twelve months.

The impact of the Company's derivative financial instrument on its condensed consolidated statement of comprehensive income (loss) for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Gain (loss) recognized in other comprehensive income (loss) on derivative (effective portion)	$ 30	$ (121)	$ 4,905	$ (13,778)
Amount reclassified from accumulated other comprehensive income (loss) to interest expense (effective portion)	830	761	2,419	921
	$ 860	$ 640	$ 7,324	(12,857)

The fair values and locations in the condensed consolidated balance sheets at September 30, 2021 and December 31, 2020 of the Company's derivative liability designated as a hedging instrument were as follows (in thousands):

	Balance sheet location	September 30, 2021	December 31, 2020
Interest rate derivative - liability derivative	Accrued expenses and other	$ 3,225	$ 3,157
Interest rate derivative - liability derivative	Other long-term liabilities	$ 399	$ 7,791

The Company has classified the interest rate derivative aggregating $3.6 million and $10.9 million at September 30, 2021 and December 31, 2020, respectively, as Level 2 fair value measurements within the fair value hierarchy (see Note 1).

(12) REVENUE RECOGNITION

The Company derives revenue from two primary sources: products and services. Product revenue includes the Company's hardware and software that function together to deliver the products' essential functionality. Software and hardware are also sold on a standalone basis. Services include customer support (software updates, upgrades and technical support), consulting, design services, installation services and training. Generally, contracts with customers contain multiple performance obligations, consisting of products and services. For these contracts, the Company accounts for individual performance obligations separately if they are considered distinct.

When an arrangement contains more than one performance obligation, the Company will allocate the transaction price to each performance obligation on a relative standalone selling price basis. The Company utilizes the observable price of goods and services when they are sold separately to similar customers in order to estimate standalone selling price.

The Company's software licenses typically provide a perpetual right to use the Company's software. The Company also sells term-based software licenses that expire and Software-as-a-Service ("SaaS")-based software which are referred to as subscription arrangements. The Company does not customize its software nor are installation services required, as the customer has a right to utilize internal resources or a third-party service company. The software and hardware are delivered before related services are provided and are functional without professional services or customer support. The Company has concluded that its software licenses are functional intellectual property that are distinct, as the user can benefit from the software on its own. Product revenue is typically recognized upon transfer of control or when the software is made available for download, as this is the point the user of the software can direct the use of, and obtain substantially all of the remaining benefits from, the functional intellectual property. The Company begins to recognize software revenue related to the renewal of subscription software licenses at the start of the subscription period.

The Company offers warranties on its products. Certain of the Company's warranties are considered to be assurance-type in nature, ensuring the product is functioning as intended. Assurance-type warranties do not represent separate performance obligations. The Company also sells separately-priced maintenance service contracts which qualify as service-type warranties and represent separate performance obligations. The Company does not allow and has no history of accepting product returns.

Services revenue includes revenue from customer support and other professional services. Customer support includes software updates on a when-and-if-available basis, telephone support, integrated web-based support and bug fixes or patches. The Company sells its customer support contracts at a percentage of list or net product price. Customer support revenue is recognized ratably over the term of the customer support agreement, which is typically one year.

The Company's professional services include consulting, technical support, resident engineer services, design services and installation services. Because control transfers over time, revenue is recognized based on progress toward completion of the performance obligation. The method to measure progress toward completion requires judgment and is based on the nature of the products or services to be provided. The Company generally uses the input method to measure progress for its contracts because it believes such method best depicts the transfer of assets to the customer, which occurs as the Company incurs costs for the contracts. However, in some instances, the Company uses the output method because it best depicts the transfer of asset to the customer. Under the cost-to-cost measure of progress, the progress toward completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. When the measure of progress is based upon expended labor, progress toward completion is measured as the ratio of labor time expended to date versus the total estimated labor time required to complete the performance obligation. Revenue is recorded proportionally as costs are incurred or as labor is expended. Costs to fulfill these obligations include internal labor as well as subcontractor costs.

Customer training includes courses offered by the Company. The related revenue is typically recognized as the training services are performed.

The Company's typical performance obligations include the following:

Performance Obligation	When Performance Obligation is Typically Satisfied	When Payment is Typically Due
Software and Product Revenue		
Software licenses (perpetual or term)	Upon transfer of control; typically, when made available for download (point in time)	Generally, within 30 days of invoicing except for term licenses, which may be paid for over time
Software licenses (subscription)	Upon activation of hosted site (over time)	Generally, within 30 days of invoicing
Hardware	When control of the hardware passes to the customer; typically, upon delivery (point in time)	Generally, within 30 days of invoicing
Software upgrades	Upon transfer of control; typically, when made available for download (point in time)	Generally, within 30 days of invoicing
Customer Support Revenue		
Customer support	Ratably over the course of the support contract (over time)	Generally, within 30 days of invoicing
Professional Services		
Other professional services (excluding training services)	As work is performed (over time)	Generally, within 30 days of invoicing (upon completion of services)
Training	When the class is taught (point in time)	Generally, within 30 days of services being performed

Significant Judgments

The Company's contracts with customers often include promises to transfer multiple products and services to the customer. Determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together may require significant judgment.

Judgment is required to determine the standalone selling price ("SSP") for each distinct performance obligation. The Company typically has more than one SSP for individual products and services due to the stratification of those products and services by customers and circumstances. In these instances, the Company may use information such as the size of the customer and geographic region in determining the SSP.

Deferred Revenue

Deferred revenue is a contract liability representing amounts collected from or invoiced to customers in excess of revenue recognized. This results primarily from the billing of annual customer support agreements where the revenue is recognized over the term of the agreement. The value of deferred revenue will increase or decrease based on the timing of recognition of revenue.

Disaggregation of Revenue

The Company disaggregates its revenue from contracts with customers based on the nature of the products and services and the geographic regions in which each customer is domiciled. The Company's revenue for the three and nine months ended September 30, 2021 and 2020 was disaggregated as follows:

Three months ended September 30, 2021	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 47,134	$ 33,391	$ 12,764	$ 93,289
Europe, Middle East and Africa	32,234	19,290	7,971	59,495
Asia Pacific	26,087	10,618	4,215	40,920
Other	6,271	8,371	2,052	16,694
	$ 111,726	$ 71,670	$ 27,002	$ 210,398

Three months ended September 30, 2020	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 57,503	$ 33,275	$ 14,072	$ 104,850
Europe, Middle East and Africa	41,265	19,720	7,133	68,118
Asia Pacific	22,233	12,208	5,183	39,624
Other	7,925	8,439	2,162	18,526
	$ 128,926	$ 73,642	$ 28,550	$ 231,118

Nine months ended September 30, 2021	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 140,074	$ 97,813	$ 35,516	$ 273,403
Europe, Middle East and Africa	91,751	59,684	22,622	174,057
Asia Pacific	70,714	31,203	13,886	115,803
Other	20,205	24,112	6,800	51,117
	$ 322,744	$ 212,812	$ 78,824	$ 614,380

Nine months ended September 30, 2020	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 150,980	$ 98,392	$ 35,482	$ 284,854
Europe, Middle East and Africa	97,431	54,042	15,920	167,393
Asia Pacific	59,030	26,742	14,017	99,789
Other	18,246	24,157	5,154	47,557
	$ 325,687	$ 203,333	$ 70,573	$ 599,593

The Company's product revenue from indirect sales through its channel partner program and from its direct sales program for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Indirect sales through channel partner program	$ 25,214	$ 36,586	$ 72,491	$ 97,839
Direct sales	86,512	92,340	250,253	227,848
	$ 111,726	$ 128,926	$ 322,744	$ 325,687

The Company's product revenue from sales to enterprise customers and from sales to service provider customers for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Sales to enterprise customers	$ 20,034	$ 36,937	$ 67,225	$ 100,168
Sales to service provider customers	91,692	91,989	255,519	225,519
	$ 111,726	$ 128,926	$ 322,744	$ 325,687

The Company's product revenue and service revenue components by segment for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Product revenue				
Cloud and Edge	$ 65,587	$ 74,860	$ 180,100	$ 201,380
IP Optical Networks	46,139	54,066	142,644	124,307
Total product revenue	$ 111,726	$ 128,926	$ 322,744	$ 325,687
Service revenue				
Maintenance				
Cloud and Edge	$ 56,786	$ 57,623	$ 169,445	$ 171,032
IP Optical Networks	14,884	16,019	43,367	32,301
Total maintenance revenue	71,670	73,642	212,812	203,333
Professional services				
Cloud and Edge	20,064	21,047	59,735	56,056
IP Optical Networks	6,938	7,503	19,089	14,517
Total professional services revenue	27,002	28,550	78,824	70,573
Total service revenue	$ 98,672	$ 102,192	$ 291,636	$ 273,906

Revenue Contract Balances

The timing of revenue recognition, billings and cash collections results in billed accounts receivable; unbilled receivables, which are contract assets; and customer advances and deposits, which are contract liabilities, in the Company's condensed consolidated balance sheets. Amounts are billed as work progresses in accordance with agreed-upon contractual terms, either at periodic intervals or upon achievement of contractual milestones. Completion of services and billing may occur subsequent to revenue recognition, resulting in contract assets. The Company may receive advances or deposits from its customers before revenue is recognized, resulting in contract liabilities that are classified as deferred revenue. These assets and liabilities are reported in the Company's condensed consolidated balance sheets on a contract-by-contract basis as of the end of each reporting period. Changes in the contract asset and liability balances during the nine months ended September 30, 2021 were not materially impacted by any factors other than billing and revenue recognition. Nearly all of the Company's deferred revenue balance is related to services revenue, primarily customer support contracts. Unbilled receivables stem primarily from engagements where services have been performed; however, billing cannot occur until services are completed.

In some arrangements, the Company allows customers to pay for term-based software licenses and products over the term of the software license. The Company also sells SaaS-based software under subscription arrangements, with payment terms over the term of the SaaS agreement. Amounts recognized as revenue in excess of amounts billed are recorded as unbilled receivables. Unbilled receivables that are anticipated to be invoiced in the next twelve months are included in Accounts receivable on the Company's condensed consolidated balance sheets. The changes in the Company's accounts receivable, unbilled receivables and deferred revenue balances for the nine months ended September 30, 2021 were as follows (in thousands):

	Accounts receivable	Unbilled accounts receivable	Deferred revenue (current)	Deferred revenue (long-term)
Balance at January 1, 2021	$ 179,331	$ 58,407	$ 96,824	$ 26,010
Increase (decrease), net	(17,507)	15,479	(7,271)	(4,392)
Balance at September 30, 2021	$ 161,824	$ 73,886	$ 89,553	$ 21,618

The Company recognized approximately $81 million of revenue in the nine months ended September 30, 2021 that was recorded as deferred revenue at December 31, 2020 and approximately $86 million of revenue in the nine months ended September 30, 2020 that was recorded as deferred revenue at December 31, 2019. Of the Company's deferred revenue reported as long-term in its condensed consolidated balance sheet at September 30, 2021, the Company expects that approximately $4 million will be recognized as revenue in 2022, approximately $10 million will be recognized as revenue in 2023 and approximately $8 million will be recognized as revenue in 2024 and beyond.

All freight-related customer invoicing is recorded as revenue, while the shipping and handling costs that occur after control of the promised goods or services transfer to the customer are reported as fulfillment costs, a component of Cost of revenue - product in the Company's condensed consolidated statements of operations.

Deferred Commissions Cost

Sales commissions earned by the Company's employees are considered incremental and recoverable costs of obtaining a contract with a customer. Expense related to commission payments has been deferred on our condensed consolidated balance sheet and is being amortized over the expected life of the customer contract, which averages five years. The current and long-term portions of deferred commission expense are included as components of Other current assets and Other assets, respectively. At both September 30, 2021 and December 31, 2020, the Company had $4.1 million of deferred sales commissions capitalized.

(13) OPERATING SEGMENT INFORMATION

The Company has two reportable segments, which are intended to align with the manner in which the business is managed: Cloud and Edge, and IP Optical Networks.

The Cloud and Edge segment provides secure and reliable software and hardware products, solutions and services for enabling Voice over Internet Protocol ("VoIP") communications, Voice over Long-Term Evolution ("VoLTE") and Voice Over 5G ("VoNR") communications and Unified Communications and Collaboration ("UC&C") within service provider and enterprise networks and from the cloud. The Cloud and Edge products are increasingly software-centric and cloud-native for deployment on private, public or hybrid cloud infrastructures, in data centers, on enterprise premises and within service provider networks. Ribbon's Cloud and Edge product portfolio consists of our Session Border Controller ("SBC") products and our Network Transformation ("NTR") products.

The IP Optical Networks segment provides high-performance, secure and reliable hardware and software products solutions for IP networking, switching, routing and optical transport designed to support and enable technologies like 5G, distributed cloud computing and corresponding applications by delivering ultra-low cost-per-bit transport and multi-service flexibility. The IP Optical Networks portfolio offers multiple solutions, including 5G-native solutions for mobile backhaul, metro and edge aggregation, core networking, data center interconnect, legacy NTR and transport solutions for wholesale carriers. This portfolio is offered to service provider, enterprise and industry verticals with critical transport network infrastructures including utilities, government, defense, transportation, and education and research. Information for the IP Optical Networks segment for the nine months ended September 30, 2020 includes the financial results of this segment for the period subsequent to the ECI Acquisition Date.

The Company has not provided segment asset information as such information is not provided to the CODM and accordingly, asset information is not used in assessing segment performance. Please see Note 6 for information regarding the allocation of goodwill between segments. Segment revenue and expenses included in the tables below represent direct revenue and expenses attributable to each segment for revenue, adjusted gross profit, and the research and development expense component of adjusted EBITDA. The Company's sales, marketing, and general and administrative functions support both segments and accordingly, these costs are allocated to both segments.

The CODM utilizes revenue, adjusted gross profit and adjusted EBITDA (earnings before interest, taxes, depreciation and amortization) to measure and assess each segment's performance. The Company calculates adjusted EBITDA by excluding from income (loss) from operations: depreciation; amortization of acquired intangible assets; stock-based compensation; certain litigation costs; acquisition-, disposal- and integration-related expense; and restructuring and related expense. These adjusted measures may also exclude other items in future periods that the Company believes are not part of the Company's core business. Adjusted gross profit and adjusted EBITDA are not financial measures determined in accordance with U.S. GAAP and may not be comparable to similarly titled measures used by other companies and should not be considered a substitute for income (loss) from operations or gross profit or other results reported in accordance with U.S. GAAP. See below for a reconciliation of adjusted gross profit to gross profit and adjusted EBITDA to income (loss) from operations, as those are the most directly comparable U.S. GAAP measures.

The tables below provide information regarding revenue, adjusted gross profit, adjusted EBITDA and depreciation expense by reportable segment for the three and nine months ended September 30, 2021 and 2020 (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Segment revenue:				
Cloud and Edge	$ 142,437	$ 153,530	$ 409,280	$ 428,468
IP Optical Networks	67,961	77,588	205,100	171,125
Revenue	$ 210,398	$ 231,118	$ 614,380	$ 599,593

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Segment adjusted gross profit:				
Cloud and Edge	$ 95,998	$ 101,910	$ 276,170	$ 279,624
IP Optical Networks	24,918	35,305	84,544	71,737
Total segment adjusted gross profit	120,916	137,215	360,714	351,361
Stock-based compensation expense	(588)	(261)	(1,412)	(616)
Acquisition-related inventory and facilities adjustments	—	(2,000)	—	(2,000)
Gross profit	$ 120,328	$ 134,954	$ 359,302	$ 348,745

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Segment adjusted EBITDA:				
Cloud and Edge	$ 44,945	$ 41,921	$ 116,811	$ 89,157
IP Optical Networks	(13,240)	1,464	(22,400)	(6,681)
Total segment adjusted EBITDA	31,705	43,385	94,411	82,476
Depreciation	(4,209)	(4,494)	(12,684)	(12,754)
Amortization of intangible assets	(17,221)	(16,349)	(50,225)	(45,352)
Stock-based compensation	(4,561)	(3,969)	(14,411)	(10,167)
Acquisition-related inventory and facilities adjustments	—	(2,000)	—	(2,000)
Litigation costs	—	—	—	(2,101)
Acquisition-, disposal- and integration-related expense	(1,955)	(1,366)	(4,204)	(14,607)
Restructuring and related expense	(1,767)	(3,290)	(10,547)	(10,726)
Income (loss) from operations	1,992	11,917	$ 2,340	$ (15,231)
Segment depreciation expense:				
Cloud and Edge	$ 3,018	$ 2,990	$ 9,297	$ 8,967
IP Optical Networks	1,191	1,504	3,387	3,787
Depreciation expense	$ 4,209	$ 4,494	$ 12,684	$ 12,754

(14) MAJOR CUSTOMERS

The following customer contributed 10% or more of the Company's revenue in the three and nine months ended September 30, 2021 and 2020:

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Verizon Communications Inc.	18%	16%	17%	15%

At September 30, 2021, one customer accounted for 10% or more of the Company's accounts receivable balance, representing approximately 16% of total accounts receivable. At December 31, 2020, one customer accounted for 10% or more of the Company's accounts receivable balance, representing approximately 12% of total accounts receivable. The Company performs ongoing credit evaluations of its customers and generally does not require collateral on accounts receivable, although in some instances the Company may require letters of credit to support customer outstanding accounts receivable balances. The Company maintains an allowance for doubtful accounts and such losses have been within management's expectations.

(15) COMMON STOCK REPURCHASES

In the second quarter of 2019, the Company's Board of Directors (the "Board") approved a stock repurchase program (the "Repurchase Program") pursuant to which the Company could repurchase up to $75 million of its common stock prior to April 18, 2021. The Company did not repurchase any common stock in the year ended December 31, 2020 or in the period from January 1, 2021 though the expiration of the Repurchase Program on April 18, 2021, and had $70.5 million remaining for future repurchases upon the expiration of the Repurchase Program.

(16) STOCK-BASED COMPENSATION PLANS

2019 Stock Incentive Plan

The Company's Amended and Restated 2019 Incentive Award Plan (the "2019 Plan") provides for the award of options to purchase the Company's common stock ("stock options"), stock appreciation rights ("SARs"), restricted stock awards ("RSAs"), performance-based stock awards ("PSAs"), restricted stock units ("RSUs"), performance-based stock units ("PSUs") and other stock- or cash-based awards. Awards can be granted under the 2019 Plan to the Company's employees, officers and non-employee directors, as well as consultants and advisors of the Company and its subsidiaries.

2007 Plan

The Company's 2007 Plan provided for the award of stock options, SARs, RSAs, PSAs, RSUs, PSUs and other stock-based awards to employees, officers, non-employee directors, consultants and advisors of the Company and its subsidiaries. On and following June 5, 2019, with the exception of shares underlying awards outstanding as of that date, no additional shares may be granted under the 2007 Plan.

Assumed Stock Plans

In connection with the acquisition of Edgewater Networks, Inc. in August 2018, the Company assumed Edgewater's Amended and Restated 2002 Stock Option Plan (the "Edgewater Plan") to the extent of the shares underlying the options outstanding under the Edgewater Plan as of the Edgewater Acquisition Date (the "Edgewater Options"). The Edgewater Options were converted to Ribbon stock options (the "Ribbon Replacement Options") which are vesting under the same schedules as the respective Edgewater Options.

In connection with the Company's acquisitions of Performance Technologies Inc. ("PT") in 2014, and Network Equipment Technologies, Inc. ("NET") in 2012, the Company assumed their stock plans (collectively, the "Assumed Plans"). Any outstanding awards under the Assumed Plans that in the future expire, terminate, are cancelled or surrendered, or are repurchased by the Company will be returned to the 2019 Plan. Accordingly, no additional shares may be granted under the Assumed Plans.

Executive Equity Arrangements

Inducement Awards

In connection with his appointment as President and Chief Executive Office of Ribbon, and as an inducement for Bruce McClelland's ("Mr. McClelland") commencement of employment, the Company awarded Mr. McClelland sign-on equity grants, comprised of 462,963 RSUs and a PSU grant with both market and service conditions (the "Inducement PSUs") on March 16, 2020. The RSUs vested and were released to Mr. McClelland on March 16, 2021. Subject to Mr. McClelland's continued employment, the Inducement PSUs are eligible to vest and be settled in up to 4,750,000 shares of Ribbon common stock upon the achievement of specified share price thresholds on or prior to September 1, 2024. The first share price threshold for Mr. McClelland’s Inducement PSUs was achieved on February 26, 2021, and accordingly 1,333,333 shares were released to him. These releases are included in the applicable tables below.

Performance-Based Stock Grants

In addition to granting RSUs to its executives and certain of its employees, the Company also grants PSUs to certain of its executives, including the Inducement PSUs granted to Mr. McClelland as described above.

In 2021, 2020 and 2019, the Company granted certain of its executives (the "2021 PSUs", "2020 PSUs" and "2019 PSUs", respectively), of which 60% of each executive's PSU grant had both performance and service conditions (the "Performance PSUs") and 40% had both market and service conditions (the "Market PSUs").

Each executive's Performance PSU grant is comprised of three consecutive fiscal year performance periods beginning in the year of grant (each, a "Fiscal Year Performance Period"), with one-third of the Performance PSUs attributable to each Fiscal Year Performance Period. The number of shares that will be vest for each Fiscal Year Performance Period, if any, will be based on the achievement of certain metrics related to the Company's financial performance for the applicable year on a standalone basis (each, a "Fiscal Year Performance Condition"). The Company's achievement of the goals for each Fiscal Year Performance Condition (and the number of shares of Company common stock to vest as a result thereof) are being measured on a linear sliding scale in relation to specific threshold, target and stretch performance conditions, with any shares earned vesting in the first quarter of the fiscal year following the third Performance Period of the grant, pending each executive's continued employment with the Company through that date. The number of shares of common stock underlying the Performance PSUs that can be earned will in no event exceed 200% of the Performance PSUs. Shares subject to the Performance PSUs that fail to be earned will be forfeited.

The Market PSUs have one three-year performance period, beginning January 1 in the year of grant and ending on December 31, three years thereafter (the "Market Performance Period"). The number of shares subject to the Market PSUs that will vest, if any, will be dependent upon the Company's total shareholder return ("TSR") compared with the TSR of the companies included in a custom index for the applicable Market Performance Period, measured by the Compensation Committee after the Market Performance Period ends, with any shares earned vesting in the first quarter of the fiscal year following the respective Market Performance Period, pending each executive's continued employment with the Company through that date. The number of shares of common stock underlying the Market PSUs that can be earned will in no event exceed 200% of the Market PSUs. Shares subject to the Market PSUs that fail to be earned will be forfeited.

In addition, in connection with his appointment as Executive Vice President and General Manager, Packet Optical Networking, the Company granted Sam Bucci 133,333 PSUs (the "Bucci Stock Price PSUs") with both market and service conditions. Subject to Mr. Bucci's continued employment, the Bucci Stock Price PSUs were eligible to vest and be settled in shares of Ribbon's common stock upon the achievement of a specific share price threshold on or prior to January 31, 2022. The share price threshold for Mr. Bucci’s Stock Price PSUs was achieved on February 12, 2021, and the shares were released to him. This release is included in the applicable table below.

Accounting for Performance PSUs. Once the grant date criteria have been met for a Fiscal Year Performance Period, the Company records stock-based compensation expense for the respective underlying Performance PSUs based on its assessment of the probability that each performance condition will be achieved and the level, if any, of such achievement. The Compensation Committee determines the number of shares earned, if any, after the Company's financial results for each Fiscal Year Performance Period are finalized. Upon the determination by the Compensation Committee of the number of shares that will be received upon vesting of the Performance PSUs, such number of shares becomes fixed and the unamortized expense is recorded through the remainder of the service period, generally three years from the date of grant, at which time the total Performance PSUs earned, if any, will vest, pending each executive's continued employment with the Company through that date.

Accounting for Market PSUs. PSUs that include a market condition require the use of a Monte Carlo simulation approach to model future stock price movements based upon the risk-free rate of return, the date of return, the volatility of each entity and the pair-wise covariance between each entity. These results are then used to calculate the grant date fair values of the respective PSUs. The Company is required to record expense for the PSUs with market conditions through their respective final vesting dates, regardless of the number of shares that are ultimately earned.

At March 31, 2021, the calculation of the grant date fair value of the Market PSUs granted on March 15, 2021 had not been completed. The Company used a grant date fair value of $8.65, the closing stock price on the date of grant, to calculate expense attributable to the three months ended March 31, 2021 for these Market PSUs. During the three months ended June 30, 2021, the Company completed the Monte Carlo valuation of these Market PSUs and calculated that the grant date fair value of each Market PSU was $13.67. The Company recorded a cumulative adjustment to expense to account for the change in grant date fair value in the second quarter of 2021. The change in grant date fair value and related cumulative adjustment did not have a material impact on its consolidated financial statements.

Employee Bonus Program

Effective in 2021, the Company added an equity component to its cash bonus program for eligible employees, under which

RSUs with a grant date fair value equal to 50% of each employee's target cash bonus were granted to each such employee (the "Bonus RSUs"). Correspondingly, cash target bonuses for eligible employees were reduced by 50%. The Company implemented this program to expand the opportunities for stock ownership more broadly throughout the Company. The Bonus RSU grants are included in the applicable table below.

Stock Options

The activity related to the Company's outstanding stock options for the nine months ended September 30, 2021 was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value (in thousands)
Outstanding at January 1, 2021	207,710	$ 12.69		
Exercised	(13,815)	$ 1.76		
Expired	(3,686)	$ 17.13		
Outstanding at September 30, 2021	190,209	$ 13.40	2.79	$ 171
Vested or expected to vest at September 30, 2021	190,206	$ 13.40	2.79	$ 171
Exercisable at September 30, 2021	190,121	$ 13.41	2.79	$ 171

The total intrinsic value of options exercised was nominal in the three months ended September 30, 2021 and $0.1 million in the nine months ended September 30, 2021. The Company received nominal cash from option exercises in the three months ended September 30, 2021 and approximately $24,000 in the nine months ended September 30, 2021.

Restricted Stock Awards and Units

The activity related to the Company's RSAs for the nine months ended September 30, 2021 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2021	86,983	$ 7.04
Vested	(86,983)	$ 7.04
Unvested balance at September 30, 2021	—	$ —

The activity related to the Company's RSUs for the nine months ended September 30, 2021 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2021	6,531,110	$ 3.32
Granted	3,109,797	$ 8.55
Vested	(3,233,661)	$ 3.23
Forfeited	(692,672)	$ 4.53
Unvested balance at September 30, 2021	5,714,574	$ 6.07

The total grant date fair value of shares of restricted stock granted under RSAs and RSUs that vested during the nine months ended September 30, 2021 was $11.1 million.

Performance-Based Stock Units

The activity related to the Company's PSUs for the nine months ended September 30, 2021 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2021	6,035,931	$ 1.56
Granted	672,121	$ 10.22
Vested	(1,525,681)	$ 0.98
Forfeited	(193,318)	$ 5.89
Unvested balance at September 30, 2021	4,989,053	$ 2.90

The total grant date fair value of shares of restricted stock granted under PSUs that vested during the nine months ended September 30, 2021 was $1.5 million.

Stock-Based Compensation

The condensed consolidated statements of operations include stock-based compensation for the three and nine months ended September 30, 2021 and 2020 as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Product cost of revenue	$ 96	$ 57	$ 216	$ 123
Service cost of revenue	492	204	1,196	493
Research and development	1,223	868	3,010	2,164
Sales and marketing	1,581	1,189	5,207	2,952
General and administrative	1,169	1,651	4,782	4,435
	$ 4,561	$ 3,969	$ 14,411	$ 10,167

At September 30, 2021, there was $29.3 million, net of expected forfeitures, of unrecognized stock-based compensation expense related to unvested stock options, stock awards and stock units. This expense is expected to be recognized over a weighted average period of approximately two years.

(17) LEASES

The Company has operating and finance leases for corporate offices, research and development facilities, and certain equipment. Operating leases are reported separately in the Company's condensed consolidated balance sheets. Assets acquired under finance leases are included in Property and equipment, net, in the condensed consolidated balance sheets.

The Company determines if an arrangement is a lease at inception. A contract is determined to contain a lease component if the arrangement provides the Company with a right to control the use of an identified asset. Lease agreements may include lease and non-lease components. In such instances for all classes of underlying assets, the Company does not separate lease and non-lease components but rather, accounts for the entire arrangement under leasing guidance. Leases with an initial term of 12 months or less are not recorded on the balance sheet and lease expense for these leases is recognized on a straight-line basis over the lease term.

Right-of-use assets and lease liabilities are initially measured based on the present value of the future minimum fixed lease payments (i.e., fixed payments in the lease contract) over the lease term at the commencement date. As the Company's existing leases do not have a readily determinable implicit rate, the Company uses its incremental borrowing rate based on the information available at the commencement date in determining the present value of future minimum fixed lease payments. The Company calculates its incremental borrowing rate to reflect the interest rate that it would have to pay to borrow on a collateralized basis an amount equal to the lease payments in a similar economic environment over a similar term and considers its historical borrowing activities and market data from entities with comparable credit ratings in this determination. The measurement of the right-of-use asset also includes any lease payments made prior to the commencement date (excluding any lease incentives) and initial direct costs incurred. The Company assessed its right-of-use assets for impairment as of September 30, 2021 and December 31, 2020 and determined no impairment has occurred.

Lease terms may include options to extend or terminate the lease and the Company incorporates such options in the lease term when it has the unilateral right to make such an election and it is reasonably certain that the Company will exercise that option. In making this determination, the Company considers its prior renewal and termination history and planned usage of the assets under lease, incorporating expected market conditions.

For operating leases, lease expense for minimum fixed lease payments is recognized on a straight-line basis over the lease term. The expense for finance leases includes both interest and amortization expense components, with the interest component calculated based on the effective interest method and the amortization component calculated based on straight-line amortization of the right-of-use asset over the lease term. Lease contracts may contain variable lease costs, such as common area maintenance, utilities and tax reimbursements that vary over the term of the contract. Variable lease costs are not included in minimum fixed lease payments and as a result, are excluded from the measurement of the right-of-use assets and lease liabilities. The Company expenses all variable lease costs as incurred.

In connection with the 2020 Restructuring Initiative, the Company accelerated amortization totaling $0.2 million and $0.6 million in the three and nine months ended September 30, 2021, respectively, for leased facilities that were vacated in 2021 as part of the consolidation of certain sites following the ECI Acquisition. The Company did not record estimated future variable lease costs in the three or nine months ended September 30, 2021 related to the 2020 Restructuring Initiative.

In connection with the 2019 Restructuring Initiative, certain lease assets related to facilities are being partially or fully vacated as the Company consolidates its facilities. The Company has no plans to enter into sublease agreements for certain facilities. The Company ceased use of these facilities in the first quarter of 2021, the first and fourth quarters of 2020 and the third quarter of 2019. Accordingly, the Company accelerated the amortization of the associated lease assets through the planned cease-use date of each facility, resulting in additional amortization expense of $3.4 million and $0.1 million in the nine months ended September 30, 2021 and 2020, respectively. The Company also recorded expense of $1.4 million in the aggregate in the nine months ended September 30, 2021 for all estimated future variable lease costs related to these facilities. The Company did not record additional amortization expense or estimated future variable lease costs in the three months ended September 30, 2021 or 2020 related to the 2019 Restructuring Initiative.

All accelerated amortization and accrual of future variable costs are recorded as Restructuring and related expense in the Company's condensed consolidated statements of operations. At September 30, 2021 and December 31, 2020, the Company had accruals of $1.8 million and $0.8 million, respectively, for all future anticipated variable lease costs related to these facilities. The Company may incur additional future expense if it is unable to sublease other locations included in the Facilities Initiative.

The Company leases its corporate offices and other facilities under operating leases, which expire at various times through 2032. In December 2020, the Company began relocating from its former leased Plano, Texas facility to its recently completed leased facility, also located in Plano, Texas, which became the Company's corporate headquarters. The Company's relocation to the new corporate headquarters was completed in the first quarter of 2021.

The Company's right-of-use lease assets and lease liabilities at September 30, 2021 and December 31, 2020 were as follows (in thousands):

	Classification	September 30, 2021	December 31, 2020
Assets:			
Operating lease assets	Operating lease right-of-use assets	$ 54,446	$ 69,757
Finance lease assets*	Property and equipment, net	416	983
Total leased assets		$ 54,862	$ 70,740
Liabilities:			
Current:			
Operating	Operating lease liabilities	$ 17,848	$ 17,023
Finance	Accrued expenses and other	574	902
Noncurrent:			
Operating	Operating lease liabilities, net of current	58,609	72,614
Finance	Other long-term liabilities	159	568
Total lease liabilities		$ 77,190	$ 91,107

* Finance lease assets were recorded net of accumulated depreciation of $1.6 million and $1.9 million at September 30, 2021 and December 31, 2020, respectively.

The components of lease expense for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Operating lease cost*	$ 4,996	$ 5,350	$ 19,027	$ 13,911
Finance lease cost:				
Amortization of leased assets	158	291	567	929
Interest on lease liabilities	12	39	58	141
Short-term lease cost	3,327	4,821	9,889	15,945
Variable lease costs (costs excluded from minimum fixed lease payments)**	589	697	3,247	1,969
Sublease income	(510)	(307)	(985)	(871)
Net lease cost	$ 8,572	$ 10,891	$ 31,803	$ 32,024

* Operating lease costs for the three and nine months ended September 30, 2021 included $0.6 million and $4.0 million, respectively, of accelerated amortization for certain assets partially or fully vacated in 2021 with no intent or ability to sublease. Operating lease costs for the nine months ended September 30, 2020 included $0.1 million of accelerated amortization for certain assets partially or fully vacated in 2020 with no ability to sublease. The Company did not record accelerated amortization in the three months ended September 30, 2020.

** Variable lease costs for the nine months ended September 30, 2021 included accruals of $1.4 million for all future estimated variable expenses related to certain assets partially or fully vacated in 2021 with no intent or ability to sublease. No such variable costs were accrued in the three months ended September 30, 2021 or in the three and nine months ended September 30, 2020.

Cash flow information related to the Company's leases for the nine months ended September 30, 2021 and 2020 was as follows (in thousands):

	Nine months ended			
	September 30, 2021		September 30, 2020	
Cash paid for amounts included in the measurement of lease liabilities:				
Operating cash flows for operating leases	$	16,509	$	13,933
Operating cash flows for finance leases	$	58	$	141
Financing cash flows for finance leases	$	736	$	971

Other information related to the Company's leases as of September 30, 2021 and December 31, 2020 was as follows:

	September 30, 2021		December 31, 2020
Weighted average remaining lease term (years):			
Operating leases	6.44		
Finance leases	1.21		
Weighted average discount rate:			
Operating leases	5.64	%	5.67
Finance leases	4.36	%	6.15

Future minimum fixed lease payments under noncancelable leases at September 30, 2021 were as follows (in thousands):

	September 30, 2021			
	Operating leases		Finance leases	
Remainder of 2021	$	5,877	$	178
2022		20,496		514
2023		17,712		63
2024		9,741		—
2025		7,733		—
2026 and beyond		31,225		—
Total lease payments		92,784		755
Less: interest		(16,327)		(22)
Present value of lease liabilities	$	76,457	$	733

(18) INCOME TAXES

The Company's income tax provisions for the nine months ended September 30, 2021 and 2020 reflect the Company's estimates of the effective rates expected to be applicable for the respective full years, adjusted for any discrete events, which are recorded in the period that they occur. These estimates are reevaluated each quarter based on the Company's estimated tax expense for the full year. The estimated effective tax rate includes the impact of valuation allowances in various jurisdictions.

The Company intends to continue to maintain a full valuation allowance on its deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of the allowance. However, given its current earnings and anticipated future earnings, the Company believes there is a reasonable possibility that within the next 12 months, sufficient positive evidence may become available to reach a conclusion that a significant portion of the U.S. valuation allowance will no longer be needed. Release of the valuation allowance would result in the recognition of certain deferred tax assets and a decrease in income tax expense for the period in which the release is recorded. However, the exact timing and amount, of the valuation allowance release, if any, are subject to change on the basis of the level of profitability that the Company is able to actually achieve.

(19) COMMITMENTS AND CONTINGENCIES

Liabilities for Royalty Payments to the IIA. Prior to the ECI Acquisition, ECI had received research and development grants from the Office of the Innovation Authority of the Israeli Ministry of Economics (the "IIA"). The Company assumed ECI's contract with the IIA, which requires the Company to pay royalties to the IIA on proceeds from the sale of products which the Israeli government has supported by way of research and development grants. The royalties for grants prior to 2017 were calculated at the rates of 1.3% to 5.0% of the aggregated proceeds from the sale of such products developed at certain of the Company's R&D centers, up to an amount not exceeding 100% of such grants plus interest at LIBOR. Effective for grants approved in 2017 and subsequently, interest was calculated at the higher of LIBOR plus 1.5% to 2.75%. At September 30, 2021, the Company's maximum possible future royalties commitment, including $4.3 million of unpaid royalties accrued, was $35.9 million, including interest of $1.9 million, based on estimates of future product sales, grants received from the IIA not yet repaid, and management's estimation of products still to be sold.

Research and Development Grants. The Company records grants received from the IIA as a reduction to research and development expense. Royalties payable to the IIA are recognized pursuant to sales of related products and are classified as Cost of revenue. The Company does not anticipate receiving material grants from the IIA in the foreseeable future.

Litigation. On November 8, 2018, Ron Miller, a purported stockholder of the Company, filed a Class Action Complaint (the "Miller Complaint") in the United States District Court for the District of Massachusetts (the "Massachusetts District Court") against the Company and three of its former officers (collectively, the "Defendants"), claiming to represent a class of purchasers of Sonus common stock during the period from January 8, 2015 through March 24, 2015 and alleging violations of the federal securities laws. Similar to a previous complaint entitled Sousa et al. vs. Sonus Networks, Inc. et al., which was dismissed with prejudice by an order dated June 6, 2017, the Miller Complaint claims that the Defendants made misleading forward-looking statements concerning Sonus' expected fiscal first quarter of 2015 financial performance, which statements were also the subject of an August 7, 2018 Securities and Exchange Commission Cease and Desist Order, whose findings the Company neither admitted nor denied. The Miller plaintiffs are seeking monetary damages.

After the Miller Complaint was filed, several parties filed and briefed motions seeking to be selected by the Massachusetts District Court to serve as a Lead Plaintiff in the action. On June 21, 2019, the Massachusetts District Court appointed a group as Lead Plaintiffs and the Lead Plaintiffs filed an amended complaint on July 19, 2019. On August 30, 2019, the Defendants filed a motion to dismiss the Miller Complaint and, on October 4, 2019, the Lead Plaintiffs filed an opposition to the motion to dismiss. There was an oral argument on the motion to dismiss on February 12, 2020.

In addition, the Company is often a party to disputes and legal proceedings that it considers routine and incidental to its business. Management does not expect the results of any of these actions to have a material effect on the Company's business or condensed consolidated financial statements.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion of the financial condition and results of operations of Ribbon Communications Inc. should be read in conjunction with the condensed consolidated financial statements and the related notes thereto included elsewhere in this Quarterly Report on Form 10-Q and the audited financial statements and notes thereto and Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report on Form 10-K for the year ended December 31, 2020, which was filed with the U.S. Securities and Exchange Commission on February 26, 2021.

Overview

We are a leading global provider of communications technology to service providers and enterprises. We provide a broad range of software and high-performance hardware products, solutions and services that enable the secure delivery of data and voice communications for residential consumers and for small, medium and large enterprises and industry verticals such as finance, education, government, utilities and transportation. Our mission is to create a recognized global technology leader providing increasingly cloud-centric solutions that enable the secure exchange of information, with unparalleled scale, performance and elasticity. Headquartered in Plano, Texas, we have a global presence with research and development and/or sales and support locations in over thirty-five countries around the world.

Impact of COVID-19 on Our Business

In 2020, a novel strain of the coronavirus (COVID-19) was declared by the World Health Organization to be a global pandemic. The COVID-19 pandemic has had a negative effect on the global economy, disrupting the various manufacturing, commodity and financial markets and increasing volatility, and has impeded global supply chains, including that of our IP Optical Networks operating segment. Continued dampened global economic conditions as a result of the COVID-19 pandemic, especially in areas where a vaccine rollout is slower, such as Australia and India, may cause our customers to restrict spending or delay purchases for an indeterminate period of time and consequently cause our revenues to decline. In addition, our ability to deliver our solutions as agreed upon with our customers depends on the ability of our global contract manufacturers, vendors, licensors and other business partners to deliver products or perform services we have procured from them. While, to date, we have not experienced material issues, if the ongoing COVID-19 pandemic impairs the ability of our business partners to support us on a timely basis, or negatively impacts the demand for our customers' other products and services, our ability to perform our customer contracts as well as the demand for our solutions may suffer. In addition, disruptions from the COVID-19 pandemic could include, and with respect to our IP Optical Networks operating segment have included, disruption of logistics necessary to import, export and deliver our solutions. The COVID-19 pandemic continues to limit in some locations, including India, the ability of our employees to perform their work due to illness caused by the pandemic or local, state or federal orders requiring employees to remain at home. The degree to which the COVID-19 pandemic ultimately impacts our business, financial position and results of operations will depend on future developments beyond our control, including the effectiveness and timing of any vaccines, the frequency and duration of future waves of infection, the effectiveness and timing of any vaccines, the extent of actions to contain or treat the virus, how quickly and to what extent normal economic and operating conditions can resume, and the severity and duration of the global economic downturn that results from the pandemic.

As a response to the ongoing COVID-19 pandemic, we have continued to implement plans to manage our costs. We have significantly reduced travel, marketing and other discretionary expenses except where necessary to meet customer or regulatory needs and acted to limit discretionary spending. To the extent the business disruption continues for an extended period, additional cost management actions will be considered. Any future asset impairment charges, increases in the allowance for doubtful accounts or restructuring charges could be more likely and will be dependent on the severity and duration of this crisis.

Presentation

Unless otherwise noted, all financial amounts, excluding tabular information, in this Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") are rounded to the nearest million dollar amount, and all percentages, excluding tabular information, are rounded to the nearest percentage point.

Reclassification of Amortization of Acquired Intangible Assets

In 2020, we reclassified amounts recorded for amortization of acquired intangible assets in prior presentations from Cost of revenue - product and Sales and marketing to a separate line included in operating expenses in our consolidated statements of operations. Our management believes this presentation enhances the comparability of our financial statements to industry peers. These reclassifications did not impact our operating income (loss), net income (loss) or earnings (loss) per share for any historical periods. These reclassifications also did not impact our consolidated balance sheets or consolidated statements of cash flows.

This reclassification resulted in reductions in the three and nine months ended September 30, 2020 to Cost of revenue - product of $11.6 million and $31.5 million, respectively, and reductions to Sales and marketing of $4.7 million and $13.8 million, respectively, which amounts were reclassified to Amortization of acquired intangible assets. The reduction to Cost of revenue - product in the three months ended September 30, 2020 increased our product gross profit as a percentage of product revenue ("product gross margin") and our total gross profit as a percentage of revenue ("total gross margin) by approximately nine percentage points and five percentage points, respectively. The reduction to Cost of revenue - product in the nine months ended September 30, 2020 increased our product gross margin and total gross margin by approximately ten percentage points and five percentage points, respectively.

Acquisition of ECI Telecom Group Ltd.

On March 3, 2020 (the "ECI Acquisition Date"), we completed the acquisition of ECI in accordance with the terms of the Agreement and Plan of Merger, dated as of November 14, 2019, by and among Ribbon, an indirect wholly-owned subsidiary of Ribbon ("Merger Sub"), Ribbon Communications Israel Ltd., ECI, and ECI Holding (Hungary) kft, pursuant to which Merger Sub merged with and into ECI, with ECI surviving such merger as a wholly-owned subsidiary of Ribbon (the "ECI Acquisition"). Prior to the ECI Acquisition Date, ECI was a privately-held global provider of end-to-end packet-optical transport and software-defined networking ("SDN") and network function virtualization ("NFV") solutions for service providers, enterprises and data center operators. Ribbon believes the ECI Acquisition positions the Company for growth and enhances its competitive strengths by expanding its product portfolio beyond solutions primarily supporting voice applications to include data applications and optical networking.

As consideration for the ECI Acquisition, we issued the ECI shareholders and certain others 32.5 million shares of Ribbon common stock with a fair value of $108.6 million (the "Stock Consideration") and paid $322.5 million of cash, comprised of $183.3 million to repay ECI's outstanding debt, including both principal and interest, and $139.2 million paid to ECI's selling shareholders (the "Cash Consideration"). In addition, ECI shareholders received $33.4 million from the sale of certain of ECI's real estate assets. Cash Consideration was financed through cash on hand and committed debt financing consisting of a new $400 million term loan facility and new $100 million revolving credit facility, which was undrawn at the ECI Acquisition Date. The ECI Acquisition has been accounted for as a business combination and the financial results of ECI have been included in our consolidated financial statements for the periods subsequent to the ECI Acquisition Date.

Sale of Kandy Communications Business and Investment in AVCT

On December 1, 2020 (the "Kandy Sale Date"), we completed the sale of our Kandy Communications Business to American Virtual Cloud Technologies, Inc. ("AVCT"). AVCT purchased the assets and assumed certain liabilities associated with the Kandy Communications Business, as well as all of the outstanding interests in Kandy Communications LLC, a subsidiary of the Company (the "Kandy Sale"). The assets acquired and liabilities assumed by AVCT in connection with the Kandy Sale were primarily comprised of accounts receivable, property and equipment, trade accounts payable and employee-related accruals.

As consideration, AVCT paid us $45.0 million, subject to certain adjustments, in the form of units of AVCT's securities (the "AVCT Units"), with each AVCT Unit consisting of: $1,000 in principal amount of AVCT’s Series A-1 convertible debentures (the “Debentures”); and (ii) one warrant to purchase 100 shares of AVCT common stock, $0.0001 par value (the “Warrants”), as consideration for the Kandy Sale. We received 43,778 AVCT Units as consideration on the Kandy Sale Date.

The Debentures bore interest at a rate of 10% per annum, which was being added to the principal amount of the Debentures. The entire principal amount of each Debenture, together with accrued and unpaid interest thereon, was due and payable on the earlier of the May 1, 2023 maturity date or the occurrence of a Change in Control as defined in the definitive purchase agreement, as amended (the "Amended Kandy Agreement"). Each Debenture was convertible, in whole or in part, at any time at our option into that number of shares of AVCT common stock, calculated by dividing the principal amount being converted, together with all accrued and unpaid interest thereon, by the applicable conversion price, which initially per share was $3.45. The Debentures were subject to mandatory conversion if the AVCT stock price was at or above $6.00 per share for 40 trading days in any 60 consecutive trading day period, subject to the satisfaction of certain other conditions. The conversion price was subject to customary adjustments including, but not limited to, stock dividends, stock splits and reclassifications. As of February 19, 2021, the stock price had traded above $6.00 for 40 days within a 60 consecutive trading day period, and accordingly, on September 8, 2021 (the "Debenture Conversion Date") upon the completion of customary regulatory filings by AVCT, the Debentures were converted into 13,700,421 shares of AVCT common stock (the "Debenture Shares").

The Warrants were independent of the Debentures and entitle us to purchase 4,377,800 shares of AVCT common stock at an exercise price of $0.01 per share. The Warrants were immediately exercisable on the Kandy Sale Date and expire on December 1, 2025. We had not exercised any of the Warrants as of September 30, 2021. We were also subject to a lock-up provision which limited our ability to sell any shares of the AVCT common stock underlying the Debentures and the Warrants prior to June 1, 2021 (the "Lock-Up Period"), except in certain transactions.

We determined that the AVCT Units had a fair value of $84.9 million at the Kandy Sale Date, comprised of the Debentures with a fair value of $66.3 million and the Warrants with a fair value of $18.6 million. The value of the net assets sold to AVCT totaled $1.3 million, resulting in a gain on the sale of $83.6 million. We calculated the fair value of the Debentures using a Lattice-based valuation approach, which utilizes a binomial tree to model the different paths the price of AVCT's common stock might take over the Debentures' life by using assumptions regarding the stock price volatility and risk-free interest rate. These results were then used to calculate the fair value of the Debentures at each measurement date prior to the Debenture Conversion Date. We used the Black-Scholes valuation model for estimating the fair value of the Warrants at each measurement date. The fair value of the Warrants was affected by AVCT's stock price as well as valuation assumptions, including the volatility of AVCT's stock price, expected term of the option, risk-free interest rate and expected dividends. Both the Lattice and Black-Scholes valuation models are based on available market data, giving consideration to all of the rights and obligations of each instrument and precluding the use of "blockage" discounts or premiums in determining the fair value of a large block of financial instruments. After the expiration of the Lock-Up Period and prior to the Debenture Conversion Date, we valued the AVCT Units at each measurement date by multiplying the closing stock price of AVCT common stock by the number of shares upon conversion of the Debentures and Warrants. At September 30, 2021, we valued the Debenture Shares and Warrants by multiplying the closing stock price of AVCT common stock by the number of Debenture Shares and Warrants (collectively, the "AVCT Investment") we held.

At September 30, 2021, the aggregate fair value of the AVCT Investment was $50.4 million, comprised of $38.2 million for the Debenture Shares and $12.2 million for the Warrants. At December 31, 2020, the aggregate fair value of the AVCT Units was $115.2 million. We recorded losses of $56.5 million and $68.3 million in the three and nine months ended September 30, 2021, respectively, arising from the change in their aggregate fair value. These amounts are included as components of Other income (expense), net, in our condensed consolidated statements of operations. We recorded $0.9 million and $3.6 million of interest income in the three and nine months ended September 30, 2021, respectively, which was added to the principal amount of the Debentures prior to the Debenture Conversion Date, and which is included in Interest expense, net, in our condensed consolidated statements of operations. The fair value of the AVCT Investment at September 30, 2021 and the fair values of the Debentures and Warrants at December 31, 2021 are reported as Investments in our condensed consolidated balance sheets. The AVCT Investment is classified as a Level 1 fair value measurement at September 30, 2021 and the Debentures and Warrants are classified as Level 2 fair value measurements within the fair value hierarchy at December 31, 2020.

We evaluated the nature of our investment in AVCT for the period from the Debenture Conversion Date through September 30, 2021 and determined that it represented an approximate 25% equity interest in AVCT. We determined that we are not the primary beneficiary of AVCT as we do not have the power to direct the activities that most significantly impact the AVCT Investment's economic performance and therefore concluded that, although we have significant influence arising from the AVCT Investment, we do not have a controlling financial interest that would require consolidation as of September 30, 2021.

Operating Segments

Effective in the fourth quarter of 2020 and in connection with the ECI Acquisition, our CODM began to assess our performance based on the performance of two separate organizations within Ribbon: the Cloud and Edge operating segment ("Cloud and Edge") and the IP Optical Networks operating segment ("IP Optical Networks"). Amounts attributable to IP Optical Networks in the nine months ended September 30, 2020 are for the period subsequent to the ECI Acquisition Date. For additional details regarding our operating segments, see Note 13 - Operating Segment Information to our condensed consolidated financial statements.

Financial Overview

Financial Results

We reported income from operations of $2.0 million and $11.9 million for the three months ended September 30, 2021 and 2020, respectively. We reported income from operations of $2.3 million for the nine months ended September 30, 2021 and a loss from operations of $15.2 million for the nine months ended September 30, 2020.

Our revenue was $210.4 million and $231.1 million in the three months ended September 30, 2021 and 2020, respectively. Our total gross profit and total gross margin were $120.3 million and 57.2%, respectively, in the three months ended September 30, 2021, and $135.0 million and 58.4%, respectively, in the three months ended September 30, 2020. Our revenue was $614.4 million and $599.6 million in the nine months ended September 30, 2021 and 2020, respectively. Our total gross profit and total gross margin were $359.3 million and 58.5%, respectively, in the nine months ended September 30, 2021, and $348.7 million and 58.2%, respectively, in the nine months ended September 30, 2020.

Revenue from our Cloud and Edge segment was $142.4 million and $153.5 million in the three months ended September 30, 2021 and 2020, respectively. Total gross profit and total gross margin for this segment were $95.6 million and 67.1%, respectively, in the three months ended September 30, 2021, and $101.7 million and 66.2%, respectively, in the three months ended September 30, 2020. Revenue from our Cloud and Edge segment was $409.3 million and $428.5 million in the nine months ended September, 2021 and 2020, respectively. Total gross profit and total gross margin for this segment were $275.2 million and 67.2%, respectively, in the nine months ended September 30, 2021, and $279.1 million and 65.1%, respectively, in the nine months ended September 30, 2020.

Revenue from our IP Optical Networks segment was $68.0 million and $77.6 million in the three months ended September 30, 2021 and 2020, respectively. Total gross profit and total gross margin for this segment were $24.7 million and 36.4%, respectively, in the three months ended September 30, 2021, and $33.2 million and 42.8%, respectively, in the nine months ended September 30, 2020. Revenue from our IP Optical Networks segment was $205.1 million and $171.1 million in the nine months ended September 30, 2021 and 2020, respectively. Total gross profit and total gross margin for this segment were $84.1 million and 41.0%, respectively, in the nine months ended September 30, 2021, and $69.7 million and 40.7%, respectively, in the nine months ended September 30, 2020.

Our operating expenses were $118.3 million and $123.0 million in the three months ended September 30, 2021 and 2020, respectively. Operating expenses for the three months ended September 30, 2021 included $17.2 million of amortization of acquired intangible assets, $2.0 million of acquisition-, disposal- and integration-related expense, and $1.8 million of restructuring and related expense. Operating expenses for the three months ended September 30, 2020 included $16.3 million of amortization of acquired intangible assets, $1.4 million of acquisition-, disposal- and integration-related expense, and $3.3 million of restructuring and related expense.

Our operating expenses were $357.0 million and $364.0 million in the nine months ended September 30, 2021 and 2020 respectively. Operating expenses for the nine months ended September 30, 2021 included $50.2 million of amortization of acquired intangible assets, $4.2 million of acquisition-, disposal- and integration-related expense, and $10.5 million of restructuring and related expense. Our operating expenses for the nine months ended September 30, 2020 included $45.4 million of amortization of acquired intangible assets, $14.6 million of acquisition-, disposal- and integration-related expense, and $10.7 million of restructuring and related expense.

We recorded stock-based compensation expense of $4.6 million and $4.0 million in the three months ended September 30, 2021 and 2020, respectively, and $14.4 million and $10.2 million in the nine months ended September 30, 2021 and 2020, respectively. These amounts are included as components of both Cost of revenue and Operating expenses in our condensed consolidated statements of operations.

See "Results of Operations" in this MD&A for a discussion of the changes in our revenue and expenses for the three and nine months ended September 30, 2021 compared to the three and nine months ended September 30, 2020.

Restructuring and Cost Reduction Initiatives

2020 Restructuring Initiative. In 2020, we implemented a restructuring plan to eliminate certain positions and redundant facilities, primarily in connection with the ECI Acquisition, to further streamline our global footprint and improve our operations (the "2020 Restructuring Initiative"). In connection with this initiative, we expect to eliminate duplicate functions arising from the ECI Acquisition and support our efforts to integrate the two companies.

We recorded restructuring and related expense of $0.6 million and $2.9 million in connection with the 2020 Restructuring Initiative in the three months ended September 30, 2021 and 2020, respectively, and $2.9 million and $8.7 million in the nine months ended September 30, 2021 and 2020, respectively.

The amount recorded in the three months ended September 30, 2021 was comprised of $0.5 million for severance and related costs for approximately 10 employees and $0.1 million for costs related to restructured facilities. The amount recorded in the nine months ended September 30, 2021 was comprised of $3.1 million for severance and related costs for approximately 30 employees and $0.5 million of expense for variable and other costs related to restructured facilities, offset by a credit of $0.7 million for changes in estimate to previously recorded facilities-related amounts. The amount recorded in the nine months ended September 30, 2020 was comprised of $7.7 million for severance and related costs for approximately 125 employees and $1.0 million for facilities-related expenses. We expect that we will record additional restructuring and related expense approximating $1 million under the 2020 Restructuring Initiative in the aggregate for severance and planned facility consolidations.

2019 Restructuring Initiative. In June 2019, we implemented a restructuring plan to further streamline our global footprint, improve our operations and enhance our customer delivery (the "2019 Restructuring Initiative"). The 2019 Restructuring Initiative includes facility consolidations, refinement of our research and development activities, and a reduction in workforce. In connection with this initiative, we expect to reduce our focus on hardware and hardware-based development over time and to increase our development focus on software virtualization, functional simplicity and important customer requirements. The facility consolidations under the 2019 Restructuring Initiative (the "Facilities Initiative") include a consolidation of our North Texas sites into a single campus, housing engineering, customer training and support, and administrative functions, as well as a reduction or elimination of certain excess and duplicative facilities worldwide. In addition, we are substantially consolidating our global software laboratories and server farms into two lower cost North American sites. We continue to evaluate our properties included in the Facilities Initiative for accelerated amortization and/or right-of-use asset impairment. We expect that the actions under the Facilities Initiative will be completed in 2021.

In connection with the 2019 Restructuring Initiative, we recorded restructuring and related expense of $1.2 million and $0.4 million in the three months ended September 30, 2021 and 2020, respectively, and $7.7 million and $2.1 million in the nine months ended September 30, 2021 and 2020, respectively.

The amount recorded in the three months ended September 30, 2021 was for facilities-related costs. The amount recorded in the nine months ended September 30, 2021 was for facilities-related costs, and was comprised of $3.4 million for accelerated amortization of lease assets and $4.3 million related to variable and other facilities-related costs in connection with facility consolidations. The amount recorded in the three months ended September 30, 2020 primarily related to facility consolidations. The amount recorded in the nine months ended September 30, 2020 was comprised of $0.6 million for severance and related costs for five employees and $1.5 million related to facility consolidations, including $0.1 million of accelerated amortization of lease assets. As of September 30, 2021, the amounts accrued for severance and related costs had been paid in full. We estimate that we will record nominal, if any, additional restructuring and related expense in connection with this initiative.

Accelerated Rent Amortization. Accelerated rent amortization is recognized from the date that we commence the plan to fully or partially vacate a facility, for which there is no intent or ability to enter into a sublease, through the final vacate date. We recorded $3.4 million and $0.1 million for accelerated rent amortization in the nine months ended September 30, 2021 and 2020, respectively, in connection with our 2019 Restructuring Initiative. These amounts are included as components of Restructuring and related expense. We continue to evaluate our properties included in the Facilities Initiative for accelerated amortization and/or right-of-use asset impairment. We may incur additional future expense if we are unable to sublease other locations included in the Facilities Initiative.

Critical Accounting Policies and Estimates

Management's discussion and analysis of financial condition and results of operations is based upon our condensed consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP"). The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. We base our estimates and judgments on historical experience, knowledge of current conditions and beliefs of what could occur in the future given available information. We consider the following accounting policies to be both those most important to the portrayal of our financial condition and those that require the most subjective judgment: revenue recognition, the valuation of inventory, the valuation of the Debentures and Warrants received as consideration in connection with the Kandy Sale, warranty accruals, loss contingencies and reserves, stock-based compensation, business combinations, goodwill and intangible assets, accounting for leases, and accounting for income taxes. If actual results differ significantly from management's estimates and projections, there could be a material effect on our condensed consolidated financial statements. There were no significant changes to our critical accounting policies from January 1, 2021 through September 30, 2021. For a further discussion of our other critical accounting policies and estimates, please refer to our Annual Report on Form 10-K for the year ended December 31, 2020.

Results of Operations

Three and nine months ended September 30, 2021 and 2020

Revenue. Revenue for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands, except percentages):

	Three months ended		Decrease from prior year	
	September 30, 2021	September 30, 2020	$	%
Product	$ 111,726	$ 128,926	$ (17,200)	(13.3)%
Service	98,672	102,192	(3,520)	(3.4)%
Total revenue	$ 210,398	$ 231,118	$ (20,720)	(9.0)%

	Nine months ended		Increase (decrease) from prior year	
	September 30, 2021	September 30, 2020	$	%
Product	$ 322,744	$ 325,687	$ (2,943)	(0.9)%
Service	291,636	273,906	17,730	6.5 %
Total revenue	$ 614,380	$ 599,593	$ 14,787	2.5 %

Segment revenue for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands):

Period	Three months ended September 30, 2021			Three months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 65,587	$ 46,139	$ 111,726	$ 74,860	$ 54,066	$ 128,92
Service	76,850	21,822	98,672	78,670	23,522	102,19
Total revenue	$ 142,437	$ 67,961	$ 210,398	$ 153,530	$ 77,588	$ 231,11

Period	Nine months ended September 30, 2021			Nine months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 180,100	$ 142,644	$ 322,744	$ 201,380	$ 124,307	$ 325,68
Service	229,180	62,456	291,636	227,088	46,818	273,90
Total revenue	$ 409,280	$ 205,100	$ 614,380	$ 428,468	$ 171,125	$ 599,59

The decrease in our product revenue in the three months ended September 30, 2021 compared to the three months ended September 30, 2020 was primarily the result of lower sales of our Cloud and Edge SBC products and IP Optical Networks products, coupled with the loss of revenue due to the Kandy Sale. These decreases were partially offset by higher revenue from sales of our Cloud and Edge network transformation products.

The decrease in our product revenue in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was primarily the result of lower sales of our Cloud and Edge SBC products and the loss of revenue due to the Kandy Sale. These decreases were partially offset by higher revenue from sales of our Cloud and Edge network transformation products and the inclusion of a full nine months of revenue from our IP Optical Networks segment, compared to seven months of revenue in the nine months ended September 30, 2020.

Revenue from indirect sales through our channel partner program was 23% and 28% of our product revenue in the three months ended September 30, 2021 and 2020, respectively. Revenue from indirect sales through our channel partner program was 22% and 30% of our product revenue in the nine months ended September 30, 2021 and 2020, respectively.

Revenue from sales to enterprise customers was 18% and 29% of our product revenue in the three months ended September 30, 2021 and 2020, respectively. Revenue from sales to enterprise customers was 21% and 31% of our product revenue in the nine months ended September 30, 2021 and 2020, respectively. These sales were made through both our direct sales team and indirect sales channel partners.

The timing of the completion of customer projects and revenue recognition criteria satisfaction may cause our product revenue to fluctuate from one period to the next.

Service revenue is primarily comprised of hardware and software maintenance and support ("maintenance revenue") and network design, installation and other professional services ("professional services revenue").

Service revenue for the three and nine months ended September 30, 2021 and 2020 was comprised of the following (in thousands, except percentages):

	Three months ended		Decrease from prior year	
	September 30, 2021	September 30, 2020	$	%
Maintenance	$ 71,670	$ 73,642	$ (1,972)	(2.7)%
Professional services	27,002	28,550	(1,548)	(5.4)%
	$ 98,672	$ 102,192	$ (3,520)	(3.4)%

	Nine months ended		Increase from prior year	
	September 30, 2021	September 30, 2020	$	%
Maintenance	$ 212,812	$ 203,333	$ 9,479	4.7 %
Professional services	78,824	70,573	8,251	11.7 %
	$ 291,636	$ 273,906	$ 17,730	6.5 %

Segment service revenue for the three and nine months ended September 30, 2021 and 2020 was comprised of the following (in thousands):

	Three months ended September 30, 2021			Three months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Maintenance	$ 56,786	$ 14,884	$ 71,670	$ 57,623	$ 16,019	$ 73,6
Professional services	20,064	6,938	27,002	21,047	7,503	28,5
Total service revenue	$ 76,850	$ 21,822	$ 98,672	$ 78,670	$ 23,522	$ 102,1

	Nine months ended September 30, 2021			Nine months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Maintenance	$ 169,445	$ 43,367	$ 212,812	$ 171,032	$ 32,301	$ 203,3
Professional services	59,735	19,089	78,824	56,056	14,517	70,5
Total service revenue	$ 229,180	$ 62,456	$ 291,636	$ 227,088	$ 46,818	$ 273,9

Maintenance revenue from the Cloud and Edge and the IP Optical Networks segments each decreased by $1 million in the three months ended September 30, 2021 compared to the three months ended September 30, 2020. The increase in maintenance revenue in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was primarily due to $11 million of higher revenue from our IP Optical Networks segment, partially offset by $2 million of lower revenue from our Cloud and Edge segment. The increase in IP Optical Networks maintenance revenue in the nine months ended September 30, 2021 was partially attributable to the inclusion of a full nine months of revenue in the current year period, compared to seven months of revenue in the prior year period.

Professional services revenue from the Cloud and Edge and the IP Optical Networks segments each decreased by $1 million in the three months ended September 30, 2021 compared to the three months ended September 30, 2020. The increase in professional services revenue in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was attributable to $4.6 million of higher revenue from our IP Optical Networks segment and $3.7 million of higher revenue from our Cloud and Edge segment. The increase in IP Optical Networks professional services revenue in the nine months ended September 30, 2021 was partially attributable to the inclusion of a full nine months of revenue in the current year period, compared to seven months of revenue in the prior year period.

The following customer contributed 10% or more of our revenue in the three and nine month periods ended September 30, 2021 and 2020:

	Three months ended		Nine months ended	
Customer	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Verizon Communications Inc.	18%	16%	17%	15%

Revenue from customers domiciled outside the United States was 56% and 55% of revenue in the three months ended September 30, 2021 and 2020, respectively, and 56% and 52% of revenue in the nine months ended September 30, 2021 and 2020, respectively. Due to the timing of project completions, we expect that the domestic and international components as a percentage of revenue may fluctuate from quarter to quarter and year to year.

Our deferred product revenue was $7 million and $8 million at September 30, 2021 and December 31, 2020, respectively. Our deferred service revenue was $104 million and $115 million at September 30, 2021 and December 31, 2020, respectively. Our deferred revenue balance may fluctuate because of the timing of revenue recognition, customer payments, maintenance contract renewals, contractual billing rights and maintenance revenue deferrals included in multiple element arrangements.

We expect that our total revenue in 2021 will increase compared to 2020 as a result of both increased customer spend and continued cross-selling opportunities; however, these increases may be affected by supply chain-related challenges.

Cost of Revenue/Gross Margin. Our cost of revenue consists primarily of amounts paid to third-party manufacturers for purchased materials and services, royalties, inventory valuation adjustments, warranty costs, and manufacturing and services personnel and related costs. Our cost of revenue and gross margins for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	Three months ended		Decrease from prior year	
	September 30, 2021	September 30, 2020	$	%
Cost of revenue				
Product	$ 53,494	$ 58,545	$ (5,051)	(8.6)%
Service	36,576	37,619	(1,043)	(2.8)%
Total cost of revenue	$ 90,070	$ 96,164	$ (6,094)	(6.3)%
Gross margin				
Product	52.1 %	54.6 %		
Service	62.9 %	63.2 %		
Total gross margin	57.2 %	58.4 %		

	Nine months ended		Increase (decrease) from prior year	
	September 30, 2021	September 30, 2020	$	%
Cost of revenue				
Product	$ 144,580	$ 145,103	$ (523)	(0.4)%
Service	110,498	105,745	4,753	4.5 %
Total cost of revenue	$ 255,078	$ 250,848	$ 4,230	1.7 %
Gross margin				
Product	55.2 %	55.4 %		
Service	62.1 %	61.4 %		
Total gross margin	58.5 %	58.2 %		

Our segment cost of revenue and gross margins for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	Three months ended September 30, 2021			Three months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 20,204	$ 33,290	$ 53,494	$ 25,207	$ 33,338	$ 58,54
Service	26,632	9,944	36,576	26,612	11,007	37,61
Total cost of revenue	$ 46,836	$ 43,234	$ 90,070	$ 51,819	$ 44,345	$ 96,16
Product	69.2 %	27.8 %	52.1 %	66.3 %	38.3 %	54.6
Service	65.3 %	54.4 %	62.9 %	66.2 %	53.2 %	63.2
Total gross margin	67.1 %	36.4 %	57.2 %	66.2 %	42.8 %	58.4

	Nine months ended September 30, 2021			Nine months ended September 30, 2020		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 52,737	$ 91,843	$ 144,580	$ 68,458	$ 76,645	$ 145,10
Service	81,317	29,181	110,498	80,930	24,815	105,74
Total cost of revenue	$ 134,054	$ 121,024	$ 255,078	$ 149,388	$ 101,460	$ 250,84
Product	70.7 %	35.6 %	55.2 %	66.0 %	38.3 %	55.4
Service	64.5 %	53.3 %	62.1 %	64.4 %	47.0 %	61.4
Total gross margin	67.2 %	41.0 %	58.5 %	65.1 %	40.7 %	58.2

Our product gross margin decreased in the three months ended September 30, 2021 compared to the three months ended September 30, 2020, primarily due to the decrease in our IP Optical Networks segment product gross margin, partially offset by margin improvement in our Cloud and Edge segment. The decrease in product gross margin of our IP Optical Networks segment was primarily attributable to product and customer mix, coupled with increased costs associated with near-term supply chain-related cost increases. The increase in product gross margin of our Cloud and Edge segment was primarily attributable to the impact of the Kandy Sale and, to a lesser extent, customer and product mix.

Our product gross margin in the nine months ended September 30, 2021 was relatively unchanged compared to the nine months ended September 30, 2020. Our Cloud and Edge segment product gross margin improvement was virtually offset by the decrease in our IP Optical Networks segment product gross margin. The increase in product gross margin of our Cloud and Edge segment was primarily attributable to the impact of the Kandy Sale and, to a lesser extent, customer and product and software mix. The decrease in product gross margin of our IP Optical Networks was primarily attributable to product and customer mix, coupled with increased costs due to supply chain disruptions.

Our service gross margin decreased slightly in the three months ended September 30, 2021 compared to the three months ended September 30, 2020. Our Cloud and Edge segment service gross margin decreased, primarily due to higher installation costs. Our IP Optical Networks segment service gross margin increased as the net result of lower service return and installation costs, partially offset by the impact of the segment's fixed service costs against lower revenue.

The increase in our service gross margin in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was attributable to improvement in our IP Optical Networks service gross margin arising from lower service and installation costs. Service gross margin for our Cloud and Edge segment was relatively unchanged in the nine months ended September 30, 2021 compared to the same prior year period.

We believe that our total gross margin will decrease slightly in 2021 compared to 2020, primarily due to higher expected sales from IP Optical Networks, which have historically lower margins due to the higher hardware content in their products, coupled with higher costs associated with near-term supply chain-related cost increases.

Research and Development Expenses. Research and development expenses consist primarily of salaries and related personnel expenses and prototype costs for the design, development, testing, and enhancement of our products. Research and development expenses for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	September 30, 2021	September 30, 2020	Increase from prior year $	Increase from prior year %
Three months ended	$ 49,132	$ 49,113	$ 19	— %
Nine months ended	$ 143,339	$ 143,204	$ 135	0.1 %

Our research and development expenses were virtually flat in both the three and nine months ended September 30, 2021 compared to the three and nine months ended September 30, 2020. Lower expenses for the three months ended September 30, 2021 aggregating $6 million in our Cloud and Edge segment, primarily for employee-related and product development costs, including the impact of the sale of our Kandy Communications Business. These decreases were virtually offset by higher employee-related, product development and infrastructure-related expenses in our IP Optical Networks segment. Overall, our slightly higher employee-related costs in the three months ended September 30, 2021 were equally offset by lower product development costs. Lower expenses aggregating $20 million in our Cloud and Edge segment for the nine months ended September 30, 2021, primarily for employee-related and product development costs, were virtually offset by higher employee-related, product development and infrastructure-related expenses in our IP Optical Networks segment. Overall, increases of $2 million in each of infrastructure costs and employee-related expenses were offset by $4 million in lower product development costs.

Some aspects of our research and development efforts require significant short-term expenditures, the timing of which may cause significant variability in our expenses. We believe that rapid technological innovation is critical to our long-term success, and we are tailoring our investments to meet the requirements of our customers and market. We believe that our research and development expense in 2021 will increase compared to 2020, primarily due to incremental investment in our IP Optical Networks segment to address the global market opportunity.

Sales and Marketing Expenses. Sales and marketing expenses primarily consist of salaries and related personnel costs, commissions, travel and entertainment expenses, promotions, customer trial and evaluations inventory, and other marketing and sales support expenses. Sales and marketing expenses for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	September 30, 2021	September 30, 2020	Increase (decrease) from prior year $	Increase (decrease) from prior year %
Three months ended	$ 36,113	$ 36,898	$ (785)	(2.1)%
Nine months ended	$ 108,212	$ 101,767	$ 6,445	6.3 %

The decrease in sales and marketing expenses in the three months ended September 30, 2021 compared to the three months ended September 30, 2020 was primarily attributable to $2 million of lower employee-related expenses in our Cloud and Edge segment, partially offset by higher employee-related and marketing expenses in our IP Optical Networks segment.

The increase in sales and marketing expenses in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was primarily attributable to $12 million of higher IP Optical Networks segment expenses, partially offset by $6 million of lower Cloud and Edge segment expenses. The increase in IP Optical Networks segment expense is primarily attributable to the inclusion of a full nine months of expense in the current year period, compared to seven months of expense in the prior year period, principally employee- and infrastructure-related costs. The decrease in Cloud and Edge segment expense was primarily attributable to lower employee-related and marketing expenses.

We believe that our sales and marketing expenses will increase modestly in 2021 compared with 2020, primarily due to higher employee-related expenses and higher costs, assuming COVID-19 restrictions continue to ease.

General and Administrative Expenses. General and administrative expenses consist primarily of salaries and related personnel costs for executive and administrative personnel, and audit, legal and other professional fees. General and administrative expenses for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	September 30, 2021	September 30, 2020	Decrease from prior year $	Decrease from prior year %
Three months ended	$ 12,148	$ 16,021	$ (3,873)	(24.2)
Nine months ended	$ 40,435	$ 48,320	$ (7,885)	(16.3)

The decrease in general and administrative expenses in the three months ended September 30, 2021 compared to the three months ended September 30, 2020 was equally attributable to both of our segments. Overall, the reduction was primarily attributable to $2 million lower each of employee-related and infrastructure-related expenses.

The decrease in general and administrative expenses in the nine months ended September 30, 2021 compared to the nine months ended September 30, 2020 was primarily attributable to $7 million of lower expense for our Cloud and Edge segment, primarily comprised of $3 million of lower professional fees (i.e., consulting, legal and audit fees), the absence of $2 million of litigation-related expense, and $2 million of lower infrastructure-related expense. Lower infrastructure-related and other expenses for our IP Optical Networks segment were partially offset by higher other general and administrative expenses resulting from the inclusion of a full nine months of expense compared to seven months of expense in the prior year.

We believe that our general and administrative expenses in 2021 will be consistent with our 2020 levels and decline in future years as we realize additional integration synergies.

Amortization of Acquired Intangible Assets. Amortization of acquired intangible assets for the three and nine months ended September 30, 2021 and 2020 was as follows (in thousands, except percentages):

	September 30, 2021	September 30, 2020	Increase from prior year $	Increase from prior year %
Three months ended	$ 17,221	$ 16,349	$ 872	5.3
Nine months ended	$ 50,225	$ 45,352	$ 4,873	10.7

The increase in amortization of acquired intangible assets in both the three and nine months ended September 30, 2021 compared to the same prior year periods was primarily due to the recognition of such expense in relation to expected future cash flows, such that amortization of intangible assets is not recorded on a straight-line basis, coupled with the inclusion of amortization expense related to the ECI Acquisition for the full nine months in 2021, compared to seven months of expense in the same prior year period.

Acquisition-, Disposal- and Integration-Related Expenses. Acquisition-, disposal- and integration-related expenses include those expenses related to acquisitions that we would otherwise not have incurred. Acquisition- and disposal-related expenses include professional and services fees, such as legal, audit, consulting, paying agent and other fees. Integration-related expenses represent incremental costs related to combining our systems and processes with those of acquired businesses, such as third-party consulting and other third-party services.

Our acquisition-, disposal- and integration-related expenses for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands):

	Three months ended		Nine months ended	
	September 30, 2021	September 30, 2020	September 30, 2021	September 30, 2020
Professional and services fees (acquisition-related)	$ 13	$ 1,003	$ 156	$ 14,017
Professional and services fees (disposal-related)	—	—	241	—
Integration-related expenses	1,942	363	3,807	590
	$ 1,955	$ 1,366	$ 4,204	$ 14,607

Our acquisition-related expenses in the three and nine months ended September 30, 2020 primarily relate to the ECI Acquisition. The disposal-related expenses in the nine months ended September 30, 2021 relate to the Kandy Sale. Acquisition-, disposal- and integration-related expenses are reported separately in the condensed consolidated statements of operations.

Restructuring and Related Expense. We have been committed to streamlining our operations and reducing operating costs by closing and consolidating certain facilities and reducing our worldwide workforce. Please see the additional discussion of our restructuring initiatives in the "Restructuring and Cost Reduction Initiatives" section of the Overview of this MD&A.

We recorded restructuring and related expense of $1.8 million and $10.5 million in the three and nine months ended September 30, 2021, respectively. We recorded restructuring and related expense of $3.3 million and $10.7 million in the three and nine months ended September 30, 2020, respectively. Although we have eliminated positions as part of our restructuring initiatives, we continue to hire in certain areas that we believe are important to our future growth. Restructuring and related expense is reported separately in the condensed consolidated statements of operations.

Interest Expense, Net. Interest income and interest expense for the three and nine months ended September 30, 2021 and 2020 were as follows (in thousands, except percentages):

	Three months ended		Increase (decrease) from prior year	
	September 30, 2021	September 30, 2020	$	%
Interest income	$ 924	$ 35	$ 889	2,540.0 %
Interest expense	(3,893)	(6,889)	(2,996)	(43.5)%
Interest expense, net	$ (2,969)	$ (6,854)	$ (3,885)	(56.7)%

	Nine months ended		Increase (decrease) from prior year	
	September 30, 2021	September 30, 2020	$	%
Interest income	$ 3,668	$ 451	$ 3,217	713.3 %
Interest expense	(15,504)	(16,100)	(596)	(3.7)%
Interest expense, net	$ (11,836)	$ (15,649)	$ (3,813)	(24.4)%

Interest income in both the three and nine months ended September 30, 2021 was primarily due to the paid-in-kind interest on the Debentures, which was recorded as an increase to the fair value of the Debentures. Interest expense in the three and nine months ended September 30, 2021 was comprised of interest and debt issuance costs in connection with the 2020 Credit Facility (as defined below), including the write-off of $2.5 million of capitalized debt insurance costs in connection with the Third Amendment (as defined below), coupled with interest on finance leases.

Interest income in the three and nine months ended September 30, 2020 primarily represents interest earned on the outstanding note receivable arising from litigation that was settled in 2019. Interest expense in the three and nine months ended September 30, 2020 was comprised of interest and debt issuance costs in connection with the 2020 Credit Facility, interest on other borrowings and finance leases, and interest expense recorded in connection with the factoring of certain accounts receivable. Interest expense in the nine months ended September 30, 2020 also included the write-off of debt issuance costs in connection with the retirement of the 2019 Credit Facility, as well as the write-off of debt issuance costs related to the amendment of the 2020 Credit Facility.

Income Taxes. We recorded provisions for income taxes of $5.4 million and $1.4 million in the nine months ended September 30, 2021 and 2020, respectively. These amounts reflect our estimates of the effective rates expected to be applicable for the respective full fiscal years, adjusted for any discrete events, which are recorded in the period that they occur. These estimates are reevaluated each quarter based on our estimated tax rate for the full fiscal year. The estimated effective tax rate includes the impact of valuation allowances in various jurisdictions.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements that have or are reasonably likely to have a current or future material effect on our financial position, changes in financial position, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources.

Liquidity and Capital Resources

Our condensed consolidated statements of cash flows are summarized as follows (in thousands):

	Nine months ended		
	September 30, 2021	September 30, 2020	Change
Net loss	$ (80,877)	$ (35,169)	$ (45,708)
Adjustments to reconcile net loss to cash flows provided by operating activities	143,460	73,826	69,634
Changes in operating assets and liabilities	(54,684)	26,591	(81,275)
Net cash provided by operating activities	$ 7,899	$ 65,248	$ (57,349)
Net cash used in investing activities	$ (11,335)	$ (322,037)	$ 310,702
Net cash (used in) provided by financing activities	$ (28,017)	$ 323,018	$ (351,035)

Our cash and restricted cash aggregated $104 million at September 30, 2021 and $136 million at December 31, 2020. These amounts included cash and restricted cash aggregating $36 million at September 30, 2021 and $46 million at December 31, 2020 held by our non-U.S. subsidiaries. If we elected to repatriate all excess funds held by our non-U.S. subsidiaries as of September 30, 2021, we do not believe that the amounts of potential withholding taxes that would arise from the repatriation would have a material effect on our liquidity.

We currently maintain the Senior Secured Credit Facilities Credit Agreement (as amended, the "2020 Credit Facility"), by and among us, as a guarantor, Ribbon Communications Operating Company, Inc., as the borrower ("Borrower"), Citizens Bank, N.A. ("Citizens"), as administrative agent, a lender, issuing lender, swingline lender, joint lead arranger and bookrunner, Santander Bank, N.A., as a lender, joint lead arranger and bookrunner, and the other lenders party thereto (each, together with Citizens Bank, N.A. and Santander Bank, N.A., referred to individually as a "Lender", and collectively, the "Lenders"). For additional details regarding the terms of the 2020 Credit Facility, see Note 10 to our condensed consolidated financial statements.

On March 3, 2021 (the "Third Amendment Effective Date"), we entered into a Third Amendment to Credit Agreement (the "Third Amendment"), which further amended the 2020 Credit Facility. The Third Amendment provided for an incremental term loan facility to us in the original principal amount of $74.6 million, the proceeds of which were used on the Third Amendment Effective Date to consummate an open market purchase of all outstanding amounts under the Term B Loan. Upon the consummation of the open market purchase, the Term B Loans were assigned to the Borrower and immediately canceled, such that the outstanding amount under the Term A Loan and incremental term loan facility were combined and held by the Lenders (the "2020 Term Loan"). We are required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $20 million per year in the first three years and $30 million in the fourth year, with the final payment approximating $300 million due on the maturity date.

At September 30, 2021, we had an outstanding 2020 Term Loan balance of $380.5 million at an average interest rate of 2.9% and $5.9 million of letters of credit outstanding with an interest rate of 2.0%. We were in compliance with all covenants of the 2020 Credit Facility at both September 30, 2021 and December 31, 2020.

We are exposed to financial market risk related to foreign currency fluctuations and changes in interest rates. These exposures are actively monitored by management. To manage the volatility related to the exposure to changes in interest rates, we have entered into a derivative financial instrument. Management's objective is to reduce, where it is deemed appropriate to do so, fluctuations in earnings and cash flows associated with changes in interest rates. Our policies and practices are to use derivative financial instruments only to the extent necessary to manage exposures. We do not hold or issue derivative financial instruments for trading or speculative purposes.

As a result of exposure to interest rate movements, during March 2020, we entered into an interest rate swap arrangement, which effectively converted our $400 million term loan with its variable interest rate based upon one-month LIBOR to an aggregate fixed rate of 0.904%, plus a leverage-based margin as defined in the 2020 Credit Facility. The notional amount of this swap as of September 30, 2021 was $400 million, and the swap matures on March 3, 2025, the same date the 2020 Credit Facility matures.

Our objectives in using interest rate derivatives are to add stability to interest expense and to manage our exposure to interest rate movements. To accomplish this objective, we are using an interest rate swap as part of our interest rate risk management strategy. Interest rate swaps designated as cash flow hedges involve the receipt of variable amounts from a counterparty in exchange for making fixed-rate payments over the life of the agreements without exchange of the underlying notional amount.

The effective portion of changes in the fair value of derivatives designated and that qualify as cash flow hedges is recorded in accumulated other comprehensive income (loss) in the condensed consolidated balance sheet and is subsequently reclassified into earnings in the period that the hedged forecasted transactions affect earnings. During the three and nine months ended September 30, 2021 and 2020, such a derivative was used to hedge the variable cash flows associated with the 2020 Credit Facility. Any ineffective portion of the change in fair value of the derivative would be recognized directly in earnings. However, during the three and nine months ended September 30, 2021 and 2020, we recorded no hedge ineffectiveness.

Amounts reported in accumulated other comprehensive income (loss) related to our derivative will be reclassified to interest expense as interest is accrued on our variable-rate debt. Based upon projected forward rates, we estimate as of September 30, 2021 that $3.2 million may be reclassified as an increase to interest expense over the next 12 months.

From time to time, we enter into uncommitted and unsecured short-term loans to finance exports in China. We did not have any such short-term loans outstanding at September 30, 2021 or December 31, 2020.

We use letters of credit, performance and bid bonds in the course of our business. At September 30, 2021, we had bank guarantees, performance and bid bonds under various uncommitted facilities (collectively, the "Guarantees") aggregating $24.8 million, and $5.9 million of letters of credit under the 2020 Credit Facility (the "Letters of Credit"). At December 31, 2020, we had Guarantees aggregating $27.0 million and $5.6 million of Letters of Credit. At September 30, 2021 and December 31, 2020, we had cash collateral of $2.5 million and $2.7 million, respectively, supporting the Guarantees, which are included in Restricted cash in our condensed consolidated balance sheets.

In the second quarter of 2019, our Board of Directors (the "Board") approved a stock repurchase program pursuant to which we could repurchase up to $75 million of the Company's common stock prior to April 18, 2021. Repurchases under the program could be made in the open market, in privately negotiated transactions or otherwise, with the amount and timing of repurchases depending on the market conditions and corporate discretion. This program did not obligate us to acquire any particular amount of common stock and the program could have been extended, modified, suspended or discontinued at any time at the Board's discretion. We did not repurchase any common stock in the three and nine months ended September 30, 2020 or in the period from January 1, 2021 though the expiration of the Repurchase Program on April 18, 2021. At December 31, 2020, we had $70.5 million remaining under the Repurchase Program for future repurchases. The Repurchase Program expired on April 18, 2021.

Cash Flows from Operating Activities

Our primary source of cash from operating activities has been from cash collections from our customers. We expect cash flows from operating activities to be affected by increases and decreases in sales volumes and timing of collections, and by purchases and shipments of inventory. Our primary uses of cash from operating activities have been for personnel costs and investment in our research and development and in our and sales and marketing, and general and administrative departments.

Cash provided by operating activities in the nine months ended September 30, 2021 was $7.9 million, resulting from our net non-cash adjustments of $143.5 million, which was offset by our net loss of $80.9 million and net cash used in changes in our operating assets and liabilities of $54.7 million. The net cash used in changes in our operating assets and liabilities was primarily attributable to a $58.7 million decrease in accrued expenses and other long-term liabilities and an $11.7 million decrease in deferred revenue. These amounts were offset by lower operating assets of $11.3 million, higher accounts payable of $2.2 million and $1.9 million of lower accounts receivable. The decrease in accrued expenses and other long-term liabilities was primarily due to the cash payments related to our employee cash bonus program, facilities, professional fees and royalties. Our lower accounts receivable and deferred revenue reflected typical mid-year seasonality.

Cash provided by operating activities in the nine months ended September 30, 2020 was $65.2 million, resulting from $73.8 million of net non-cash adjustments and $26.6 million of net changes in operating assets and liabilities. These amounts were partially offset by our $35.2 million net loss. The net cash provided by changes in our operating assets and liabilities was attributable to $42.5 million of lower accounts receivable, $36.4 million of lower operating assets, $10.1 million of higher accrued expenses and other long-term liabilities and $6.3 million of lower inventory. These amounts were partially offset by $54.5 million of lower accounts payable and $14.3 million of lower deferred revenue. Our lower accounts receivable and deferred revenue primarily reflected typical mid-year seasonality. The decrease in other operating assets was primarily due to the scheduled payments received in connection with the 2019 settlement of litigation. The increase in accrued expenses and other long-term liabilities was primarily due to the derivative liability we recorded in connection with our interest rate swap, which we entered into in the first quarter of 2020.

Cash Flows from Investing Activities

Our investing activities used $11 million of cash in the nine months ended September 30, 2021, comprised of $14 million to purchase property and equipment, partially offset by $3 million of proceeds from the sale of our QualiTech business, which operates compliance testing laboratories in Israel for reliability and standardization testing for the high-tech industry, including testing in medical equipment, military equipment and vehicles.

Our investing activities used $322 million of cash in the nine months ended September 30, 2020, comprised of $347 million of cash paid as cash consideration for ECI and $19 million of investments in property and equipment. These amounts were partially offset by $43 million of cash proceeds from the sale of land in connection with the ECI Acquisition.

Cash Flows from Financing Activities

Our financing activities used $28 million of cash in the nine months ended September 30, 2021. We received $75 million of proceeds from the incremental loan obtained in connection with the Third Amendment, which amount was used to consummate an open market purchase of all outstanding amounts under the Term B Loan. In addition, we used $14 million for the payment of tax withholding obligations related to the net share settlement of restricted stock awards upon vesting, $87 million of principal payments of term debt, including the $75 million payoff of the Term B Loan in connection with the Third Amendment, and $1 million each of payments of debt issuance costs and principal payments of finance leases.

Our financing activities provided $323 million of cash in the nine months ended September 30, 2020, primarily due to $479 million of proceeds from term debt, which was comprised of $400 million of proceeds from the 2020 Credit Facility, $75 million from Term Loan B under the Amended 2020 Credit Facility and $4 million of proceeds from short-term loans in China for the financing of certain export activities. These proceeds were partially offset by the repayment of the $75 million of debt that was extinguished in connection with the First Amendment, the repayment of $57 million outstanding under the 2019 Credit Facility (comprised of $8 million under the revolving credit facility and $49 million of long-term debt), the payment of $14 million of debt issuance costs in connection with the 2020 Credit Facility and the First Amendment, the repayment of principal aggregating $8 million related to the 2020 Credit Facility and short-term loans in China, and the payment of $1 million each of tax withholding obligations related to the net share settlement of restricted stock awards upon vesting and principal payments of finance leases. We both borrowed and repaid less than $1 million under our revolving line of credit such that we did not have any outstanding revolving borrowings at September 30, 2020.

Based on our current expectations, we believe our current cash and available borrowings under the 2020 Credit Facility will be sufficient to meet our anticipated cash needs for working capital and capital expenditures for at least twelve months. The rate at which we consume cash is dependent on the cash needs of our future operations. We anticipate devoting substantial capital resources to continue our research and development efforts, to maintain our sales, support and marketing, to complete acquisition-related integration activities and for other general corporate activities. We further believe that our financial resources, along with managing discretionary expenses, will allow us to manage the anticipated impact of the COVID-19 pandemic on our business operations. Looking ahead, we have developed contingency plans to reduce costs further if the situation continues to deteriorate. The challenges posed by the COVID-19 pandemic on our business continue to evolve rapidly. Consequently, we continue to evaluate our financial position in light of future developments, particularly those relating to the COVID-19 pandemic. However, it is difficult to predict future liquidity requirements with certainty, and our cash and available borrowings under the 2020 Credit Facility may not be sufficient to meet our future needs, which would require us to refinance our debt and/or obtain additional financing. We may not be able to refinance our debt or obtain additional financing on favorable terms or at all.

Recent Accounting Pronouncements

The Financial Accounting Standards Board ("FASB") issued the following accounting pronouncement which became effective for us in 2021, and which did not have a material impact on our condensed consolidated financial statements:

The FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* ("ASU 2019-12"), which modifies ASC 740 to simplify the accounting for income taxes. ASU 2019-12 addresses the accounting for hybrid tax regimes, tax basis step-up in goodwill obtained in a transaction that is not a business combination, separate financial statements of legal entities not subject to tax, intraperiod tax allocation exception to incremental approach, ownership changes in investments - changes from a subsidiary to an equity method investment, ownership changes in investments - changes from an equity method investment to a subsidiary, interim period accounting for enacted changes in tax law and year-to-date loss limitation in interim period tax accounting.

The FASB issued the following accounting pronouncement, which we do not believe will have a material impact on our condensed consolidated financial statements upon adoption:

In January 2021, the FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848): Scope* ("ASU 2021-01"), which refines the scope of Accounting Standards Codification 848, *Reference Rate Reform* ("ASC 848") and clarifies some of its guidance as part of the FASB's monitoring of global reference rate reform activities. ASU 2021-01 permits entities to elect certain optional expedients and exceptions when accounting for derivative contracts and certain hedging relationships affected by changes in the interest rates used for discounting cash flows, for computing variation margin settlements, and for calculating price alignment interest in connection with reference rate reform activities under way in global financial markets (the "discounting transition"). ASU 2021-01 is effective for us prospectively in any period through December 31, 2022 that a modification is made to the terms of the derivatives affected by the discounting transition.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to financial market risk related to foreign currency fluctuations and changes in interest rates. Except as presented below, there have been no material changes in market risk from the information provided in Item 7A. Quantitative and Qualitative Disclosures About Market Risk of our Annual Report on Form 10-K, for the year ended December 31, 2020.

To manage the volatility related to the exposure to changes in interest rates, we have entered into a derivative financial instrument. Our objective is to reduce, where it is deemed appropriate to do so, fluctuations in earnings and cash flows associated with changes in interest rates. Our policies and practices are to use derivative financial instruments only to the extent necessary to manage exposures. We do not hold or issue derivative financial instruments for trading or speculative purposes.

Amounts reported in accumulated other comprehensive income (loss) related to our derivative will be reclassified to interest expense as interest is accrued on our variable-rate debt. The fair value of our derivative was a liability of $3.6 million at September 30, 2021. Based upon projected forward rates, we estimate as of September 30, 2021 that $3.2 million may be reclassified as an increase to interest expense over the next twelve months.

Item 4. Controls and Procedures

Disclosure Controls and Procedures

Evaluation of Disclosure Controls and Procedures. Our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of the end of the period covered by this Quarterly Report on Form 10-Q. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of September 30, 2021.

Changes in Internal Control over Financial Reporting. There have been no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the fiscal quarter ended September 30, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II OTHER INFORMATION

Item 1. Legal Proceedings

We are subject to legal proceedings and claims that have not been fully resolved and that have arisen in the ordinary course of business. Our material legal proceedings as described in Part I, Item 1 of this Form 10-Q in the Notes to Condensed Consolidated Financial Statements in Note 19, "Commitments and Contingencies," under the heading "Litigation."

The outcome of litigation is inherently uncertain. If one or more legal matters were resolved against the Company in a reporting period for amounts above management's expectations, our financial condition and operating results for that reporting period could be materially adversely affected. We settled certain matters during the fourth quarter of 2020 that did not individually or in the aggregate have a material impact on our financial condition or results of operations.

Item 1A. Risk Factors

Our business faces significant risks and uncertainties, which may have a material adverse effect on our business prospects, financial condition and results of operations, and you should carefully consider them. There have been no material changes in the nine months ended September 30, 2021 to the risk factors described in Part I, Item 1A. of our Annual Report on Form 10-K for the year ended December 31, 2021, with the exception of the risk factor below.

Risks Related to Our Indebtedness and Accounting Matters

The value of the securities received in connection with the sale of our cloud-based enterprise communications service is based on the ongoing operations of the acquiring company and is volatile. Quarterly fluctuations in price could significantly impact our financial results.

In connection with our sale of the Kandy Communications Business to AVCT, we received 43,778 AVCT Units, with each AVCT Unit consisting of (i) $1,000 in principal amount of Debentures; and (ii) one Warrant. In the third quarter of 2021, the Debentures were converted, pursuant to their terms, into shares of AVCT common stock (the "AVCT Shares"). Since AVCT's common stock is publicly traded on NASDAQ, under U.S. GAAP ("GAAP"), we elected the fair value option to record our investment in AVCT, under which we value the AVCT Shares on our balance sheet based on the trading price of the AVCT common stock. Such trading price is also used to value the Warrants on an if-converted basis. We are also required under GAAP to revalue and mark to market the value of the AVCT Shares and Warrants on a quarterly basis, with any changes in value reflected on our statements of operations and, therefore, impacting our earnings. AVCT's stock price on NASDAQ has been volatile with the closing price ranging from $2.66 to $9.26 during the nine months ended September 30, 2021. As a result, our financial statements may reflect significant swings in the value of the AVCT Shares and Warrants held on our balance sheet, which could have a material impact on our financial results, even though such changes in value would not reflect our current operating business.

We continue to rely on AVCT for the provision of products and services to a number of customers we jointly share. AVCT reported that as of June 30, 2021 (the last period for which AVCT has reported financial results as of the date of this Quarterly Report on Form 10-Q), AVCT's current liabilities exceeded its current assets by approximately $16 million. AVCT has announced a number of initiatives designed to increase its liquidity, including a $5 million loan entered into in September 2021, a proposed public offering of its common stock, and the proposed divestiture of its Computer Technology Group. AVCT believes that cash from continuing operations, taken together with these initiatives, will be sufficient to continue to fund its operations. However, if such activities are not successful, AVCT may be required to take other actions that could materially negatively affect the value of our investment in AVCT. Disruptions in AVCT's operations could also result in claims by our customers for failure to satisfy contractual service requirements and/or require us to find alternative solutions in order to satisfy our customer obligations.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

(c) Issuer Purchases of Equity Securities

The following table provides information with respect to the shares of common stock repurchased by us for the periods indicated:

Period	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (2)	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs (3)
July 1, 2021 to July 31, 2021	35,366	$ 7.38	—	$ —
August 1, 2021 to August 31, 2021	616	$ 7.11	—	$ —
September 1, 2021 to September 30, 2021	263,143	$ 6.27	—	$ —
Total	299,125	$ 6.40	—	$ —

(1) Upon vesting of restricted stock awards, certain of our employees surrender to us a portion of the newly vested shares of common stock to satisfy the tax withholding obligations that arise in connection with such vesting. During the third quarter of 2021, 299,125 shares of restricted stock were returned to us by employees to satisfy tax withholding obligations arising in connection with vesting of restricted stock, which shares are included in this column.

(2) On May 2, 2019, we announced a stock repurchase program, under which our Board of Directors authorized the repurchase of up to $75 million of our common stock from time to time on the open market or in privately negotiated transactions prior to April 18, 2021 (the "Repurchase Program"). The Repurchase Program expired on April 18, 2021.

(3) Represents amounts available for repurchases under the Repurchase Program.

Item 5. Other Information

None.

Item 6. Exhibits

Exhibit No.	Description
2.1	Agreement and Plan of Merger, dated as of November 14, 2019, by and among the Registrant, Ribbon Communications Israel Ltd., Eclipse Communications Ltd., ECI Telecom Group Ltd. and ECI Holding (Hungary) Korlátolt Felelősségű Társág (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K, filed November 14, 2019 with the SEC).
2.2	Amended and Restated Purchase Agreement, dated December 1, 2020, among Ribbon Communications Inc., Ribbon Communications Operating Company, Inc., Ribbon Communications International Limited and American Virtual Cloud Technologies, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K, filed December 7, 2020 with the SEC).
3.1	Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K12B, filed October 30, 2017 with the SEC).
3.2	Certificate of Amendment of the Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed November 28, 2017 with the SEC).
3.3	Amended and Restated By-Laws of the Registrant (incorporated by reference to Exhibit 3.3 to the Registrant's Annual Report on Form 10-K, filed March 8, 2018 with the SEC).
31.1 *	Certificate of Ribbon Communications Inc. Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2 *	Certificate of Ribbon Communications Inc. Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1 #	Certificate of Ribbon Communications Inc. Chief Executive Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2 #	Certificate of Ribbon Communications Inc. Chief Financial Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS *	Inline XBRL Instance Document
101.SCH *	Inline XBRL Taxonomy Extension Schema
101.CAL *	Inline XBRL Taxonomy Extension Calculation Linkbase
101.DEF *	Inline XBRL Taxonomy Extension Definition Linkbase
101.LAB *	Inline XBRL Taxonomy Extension Label Linkbase
101.PRE *	Inline XBRL Taxonomy Extension Presentation Linkbase
104 *	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

* Filed herewith.

\# Furnished herewith.

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.

Date: October 28, 2021

RIBBON COMMUNICATIONS INC.

By: /s/ Miguel A. Lopez

Miguel A. Lopez
Executive Vice President and Chief Financial Officer (Principal Financial Officer)

EXHIBIT 31.1

CERTIFICATION

I, Bruce McClelland, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Ribbon Communications Inc.;
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 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 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: October 28, 2021

/s/ Bruce McClelland

Bruce McClelland
President and Chief Executive Officer
(Principal Executive Officer)

EXHIBIT 31.2

CERTIFICATION

I, Miguel A. Lopez, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Ribbon Communications Inc.;

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 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 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: October 28, 2021

/s/ Miguel A. Lopez

Miguel A. Lopez
Executive Vice President and Chief Financial Officer
(Principal 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 Quarterly Report on Form 10-Q of Ribbon Communications Inc. (the "Company") for the period ended September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Bruce McClelland, President and Chief Executive Officer of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; 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: October 28, 2021

/s/ Bruce McClelland

Bruce McClelland
President and Chief Executive Officer
(Principal 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 Quarterly Report on Form 10-Q of Ribbon Communications Inc. (the "Company") for the period ended September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Miguel A. Lopez, Executive Vice President and Chief Financial Officer of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; 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: October 28, 2021

/s/ Miguel A. Lopez

Miguel A. Lopez
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)