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 June 30, 2022

☐ **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 July 22, 2022, there were 150,454,151 shares of the registrant's common stock, $0.0001 par value per share, outstanding.

RIBBON COMMUNICATIONS INC.
FORM 10-Q
QUARTERLY PERIOD ENDED JUNE 30, 2022
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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, capital structure, credit facility compliance, restructuring activities, expected impacts from the war in Ukraine and the financial sanctions imposed in connection therewith, 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 ("Kandy"), plans and objectives of management for future operations 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 (including those related to the war in Ukraine); risks related to the ongoing COVID-19 pandemic on the global economy and financial markets as well as us, 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; declines in the value of our ongoing investment in American Virtual Cloud Technologies, Inc. ("AVCT"), the purchaser of Kandy; unpredictable fluctuations in quarterly revenue and operating results; the impact on fluctuations of our EBITDA on compliance under our credit facility; 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, including inflation; the impact of restructuring and cost-containment activities; litigation; 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 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, 2021. 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)

	June 30, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 36,227	$ 103,915
Restricted cash	2,037	2,570
Accounts receivable, net	258,116	282,917
Inventory	64,648	54,043
Other current assets	54,395	37,545
Total current assets	415,423	480,990
Property and equipment, net	48,504	47,685
Intangible assets, net	319,787	350,730
Goodwill	300,892	300,892
Investments	4,520	43,931
Deferred income taxes	56,961	47,287
Operating lease right-of-use assets	46,951	53,147
Other assets	37,636	23,075
	$ 1,230,674	$ 1,347,737
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of term debt	$ 20,058	$ 20,058
Accounts payable	102,518	97,121
Accrued expenses and other	99,951	100,752
Operating lease liabilities	16,078	17,403
Deferred revenue	106,463	109,119
Total current liabilities	345,068	344,453
Long-term debt, net of current	315,264	350,217
Operating lease liabilities, net of current	48,052	55,196
Deferred revenue, net of current	19,584	20,619
Deferred income taxes	8,117	8,116
Other long-term liabilities	43,245	41,970
Total liabilities	779,330	820,571
Commitments and contingencies (Note 17)		
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; 150,459,784 shares issued and outstanding at June 30, 2022; 148,895,308 shares issued and outstanding at December 31, 2021	15	15
Additional paid-in capital	1,881,942	1,875,234
Accumulated deficit	(1,455,816)	(1,355,661)
Accumulated other comprehensive income	25,203	7,578
Total stockholders' equity	451,344	527,166
	$ 1,230,674	$ 1,347,737

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		Six months ended	
	June 30, 2022	**June 30, 2021**	**June 30, 2022**	**June 30, 2021**
Revenue:				
Product	$ 112,667	$ 113,129	$ 194,657	$ 211,018
Service	93,129	98,081	184,337	192,964
Total revenue	205,796	211,210	378,994	403,982
Cost of revenue:				
Product	58,151	46,641	109,360	91,086
Service	35,207	36,142	70,874	73,922
Amortization of acquired technology	7,888	9,700	16,155	19,761
Total cost of revenue	101,246	92,483	196,389	184,769
Gross profit	104,550	118,727	182,605	219,213
Operating expenses:				
Research and development	51,103	46,797	103,793	94,207
Sales and marketing	35,843	34,881	73,462	72,099
General and administrative	12,901	12,734	25,763	28,287
Amortization of acquired intangible assets	7,513	7,481	14,788	13,243
Acquisition-, disposal- and integration-related	1,535	1,052	3,384	2,249
Restructuring and related	2,894	2,830	7,708	8,780
Total operating expenses	111,789	105,775	228,898	218,865
(Loss) income from operations	(7,239)	12,952	(46,293)	348
Interest expense, net	(4,602)	(3,048)	(8,603)	(8,867)
Other (expense) income, net	(10,228)	17,180	(39,028)	(8,268)
(Loss) income before income taxes	(22,069)	27,084	(93,924)	(16,787)
Income tax provision	(8,111)	(3,843)	(6,231)	(4,659)
Net (loss) income	$ (30,180)	$ 23,241	$ (100,155)	$ (21,446)
(Loss) earnings per share:				
Basic	$ (0.20)	$ 0.16	$ (0.67)	$ (0.15)
Diluted	$ (0.20)	$ 0.15	$ (0.67)	$ (0.15)
Weighted average shares used to compute (loss) earnings per share:				
Basic	150,190	147,467	149,681	146,706
Diluted	150,190	154,160	149,681	146,706

See notes to the unaudited condensed consolidated financial statements.

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

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Net (loss) income	$ (30,180)	$ 23,241	$ (100,155)	$ (21,446)
Other comprehensive income (loss), net of tax:				
Unrealized gain (loss) on interest rate swap	4,053	(205)	19,522	6,464
Foreign currency translation adjustments	(322)	(447)	(1,013)	(400)
Employee retirement benefits	(884)	—	(884)	—
Other comprehensive income (loss), net of tax	2,847	(652)	17,625	6,064
Comprehensive (loss) income, net of tax	$ (27,333)	$ 22,589	$ (82,530)	$ (15,382)

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 June 30, 2022

	Common stock					
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income	Total stockholders' equity
Balance at April 1, 2022	150,111,958	$ 15	$ 1,877,677	$ (1,425,636)	$ 22,356	$ 474,412
Vesting of restricted stock units	396,148					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(48,322)		(134)			(134)
Stock-based compensation expense			4,399			4,399
Other comprehensive income					2,847	2,847
Net loss				(30,180)		(30,180)
Balance at June 30, 2022	150,459,784	$ 15	$ 1,881,942	$ (1,455,816)	$ 25,203	$ 451,344

Six months ended June 30, 2022

	Common stock					
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income	Total stockholders' equity
Balance at January 1, 2022	148,895,308	$ 15	$ 1,875,234	$ (1,355,661)	$ 7,578	$ 527,166
Exercise of stock options	355					—
Vesting of restricted stock units	2,007,138					—
Vesting of performance-based stock units	175,751					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(618,768)		(1,946)			(1,946)
Stock-based compensation expense			8,654			8,654
Other comprehensive income					17,625	17,625
Net loss				(100,155)		(100,155)
Balance at June 30, 2022	150,459,784	$ 15	$ 1,881,942	$ (1,455,816)	$ 25,203	$ 451,344

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 June 30, 2021

	Common stock						
	Shares	Amount	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive (loss) income	Total stockholders' equity
Balance at April 1, 2021	147,358,590	$ 15	$ 1,864,107	$ (1,223,163)	$ 1,774	$ 642,733
Exercise of stock options	213					—
Vesting of restricted stock awards and units	802,576					—
Shares of restricted stock returned to the Company under net share settlements to satisfy tax withholding obligations	(104,078)		(831)			(831)
Stock-based compensation expense			4,790			4,790
Other comprehensive loss					(652)	(652)
Net income				23,241		23,241
Balance at June 30, 2021	148,057,301	$ 15	$ 1,868,066	$ (1,199,922)	$ 1,122	$ 669,281

Six months ended June 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	13,602		24			24
Vesting of restricted stock awards and units	2,465,204					—
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	(1,372,434)		(12,064)			(12,064)
Stock-based compensation expense			9,850			9,850
Other comprehensive income					6,064	6,064
Net loss				(21,446)		(21,446)
Balance at June 30, 2021	148,057,301	$ 15	$ 1,868,066	$ (1,199,922)	$ 1,122	$ 669,281

See notes to the unaudited condensed consolidated financial statements.

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

	Six months ended	
	June 30, 2022	June 30, 2021
Cash flows from operating activities:		
Net loss	$ (100,155)	$ (21,446)
Adjustments to reconcile net loss to cash flows (used in) provided by operating activities:		
Depreciation and amortization of property and equipment	7,773	8,475
Amortization of intangible assets	30,943	33,004
Amortization of debt issuance costs	1,078	3,684
Stock-based compensation	8,654	9,850
Deferred income taxes	(9,900)	918
Gain on sale of business	—	(2,772)
Decrease in fair value of investments	39,411	9,171
Foreign currency exchange (gains) losses	(1,048)	2,013
Changes in operating assets and liabilities:		
Accounts receivable	24,017	17,360
Inventory	(17,043)	(1,527)
Other operating assets	(319)	9,874
Accounts payable	4,090	(3,508)
Accrued expenses and other long-term liabilities	(8,196)	(57,739)
Deferred revenue	(3,692)	673
Net cash (used in) provided by operating activities	(24,387)	8,030
Cash flows from investing activities:		
Purchases of property and equipment	(6,515)	(10,570)
Proceeds from sale of business	—	2,944
Net cash used in investing activities	(6,515)	(7,626)
Cash flows from financing activities:		
Borrowings under revolving line of credit	20,000	—
Principal payments on revolving line of credit	(20,000)	—
Proceeds from issuance of term debt		74,625
Principal payments of term debt	(35,029)	(82,147)
Principal payments of finance leases	(341)	(507)
Payment of debt issuance costs	(1,046)	(789)
Proceeds from the exercise of stock options	—	24
Payment of tax withholding obligations related to net share settlements of restricted stock awards	(1,946)	(12,064)
Net cash used in financing activities	(38,362)	(20,858)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	1,043	(442)
Net decrease in cash, cash equivalents and restricted cash	(68,221)	(20,896)
Cash, cash equivalents and restricted cash, beginning of year	106,485	135,697
Cash, cash equivalents and restricted cash, end of period	$ 38,264	$ 114,801
Supplemental disclosure of cash flow information:		
Interest paid	$ 7,833	$ 8,009
Income taxes paid	$ 5,955	$ 9,818
Income tax refunds received	$ 25	$ 974
Supplemental disclosure of non-cash investing activities:		
Capital expenditures incurred, but not yet paid	$ 3,478	$ 2,090
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	$ 6,608	$ 33,410

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, network solutions and services that enable the secure delivery of data and voice communications, and high-bandwidth networking and connectivity for residential consumer 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").

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, 2021 (the "Annual Report"), which was filed with the SEC on March 11, 2022.

Operating Segments

The Company's chief operating decision maker (the "CODM") is its President and Chief Executive Officer. The CODM assesses 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").

Reclassifications

In the fourth quarter of 2021, the Company reclassified amounts recorded for amortization of certain acquired intangible assets in prior presentations from Total operating expenses under the caption "Amortization of acquired intangible assets" to Cost of revenue under the caption "Amortization of acquired technology" in the condensed consolidated statements of operations. The Company's management believes this presentation aids in the comparability of its financial statements to industry peers. This reclassification did not impact the condensed consolidated balance sheets or statements of cash flows for any historical periods. The Company reports depreciation of property and equipment related to production activities as components of Cost of revenue. This reclassification for the three and six months ended June 30, 2021 was as follows (in thousands):

	Three months ended June 30, 2021			Six months ended June 30, 2021		
	Prior presentation	Amounts reclassified	Revised presentation	Prior presentation	Amounts reclassified	Revised presentation
Product revenue	$ 113,129		$ 113,129	$ 211,018		$ 211,018
Service revenue	98,081		98,081	192,964		192,964
Total revenue	211,210	—	211,210	403,982	—	403,982
Cost of revenue - product	46,641		46,641	91,086		91,086
Cost of revenue - service	36,142		36,142	73,922		73,922
Amortization of acquired technology	—	9,700	9,700	—	19,761	19,761
Total cost of revenue	82,783	9,700	92,483	165,008	19,761	184,769
Total gross profit	128,427	(9,700)	118,727	238,974	(19,761)	219,213
Research and development	46,797		46,797	94,207		94,207
Sales and marketing	34,881		34,881	72,099		72,099
General and administrative	12,734		12,734	28,287		28,287
Amortization of acquired intangible assets	17,181	(9,700)	7,481	33,004	(19,761)	13,243
Acquisition-, disposal- and integration-related	1,052		1,052	2,249		2,249
Restructuring and related	2,830		2,830	8,780		8,780
Total operating expenses	115,475	(9,700)	105,775	238,626	(19,761)	218,865
Income from operations	$ 12,952	$ —	$ 12,952	$ 348	$ —	$ 348

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 June 30, 2022.

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.

The Company had $2.0 million and $2.6 million of restricted cash as of June 30, 2022 and December 31, 2021, respectively, 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.

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.

Information regarding the Company's factoring of its financial assets for the three and six months ended June 30, 2022 and 2021 is as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Accounts receivable sold	$ 22,747	$ 32,329	$ 40,714	$ 63,647
Less factoring fees	(323)	$ (192)	(476)	(401)
Net cash proceeds	$ 22,424	$ 32,137	$ 40,238	$ 63,246

Going Concern Assessment and Management Plans

The accompanying condensed consolidated financial statements are prepared in accordance with GAAP applicable to a going concern, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business.

Under the 2020 Credit Facility (as defined in Note 9), the Company is required to maintain compliance with certain financial covenants (see Note 9). As of June 30, 2022, the Company was in compliance with its financial covenants. Due to the impact of market conditions, including supply chain disruptions, higher costs, and other geopolitical instabilities and disputes, the Company projects it may not maintain compliance with its financial covenants under the 2020 Credit Facility, as amended, for the quarter ended September 30, 2022. Failure to remain in compliance would be an event of default that would permit the Lenders (as defined in Note 9) to accelerate the maturity of the 2020 Credit Facility. As of the date of the issuance of these condensed consolidated financial statements, the Company does not have sufficient cash on hand or available liquidity to repay the outstanding balance of $340.5 million as of June 30, 2022 in the event the debt was accelerated.

Management plans to avoid any potential event of default include raising additional cash that would allow the Company to pay down debt in order to remain in compliance with its financial covenants. In addition, the Company has the ability to sell its derivative financial instrument, which had an aggregate fair market value of $21 million as of June 30, 2022. Lastly, the Company would evaluate the timing of its capital spending and extension of its payment terms with vendors as needed.

The Company believes its plans are probable of being successfully implemented, which along with its available cash on hand and liquidity from the factoring of receivables, will result in adequate cash to allow the Company to pay down debt to meet its financial covenant requirements.

Recent Accounting Pronouncements

In March 2022, the FASB issued ASU 2022-02, *Financial Instruments – Credit Losses (Topic 326): Troubled Debt Restructurings and Vintage Disclosures* ("ASU 2022-02"), which eliminates the accounting guidance on troubled debt restructurings (TDRs) for creditors in ASC 310, *Receivables (Topic 310)*, and requires entities to provide disclosures about current period gross write-offs by year of origination. Also, ASU 2022-02 updates the requirements related to accounting for credit losses under ASC 326, *Financial Instruments – Credit Losses (Topic 326)*, and adds enhanced disclosures for creditors with respect to loan refinancings and restructurings for borrowers experiencing financial difficulty. ASU 2022-02 is effective for the Company January 1, 2023, with early adoption permitted. The Company believes that the adoption of ASU 2022-02 will not have a material impact on its consolidated financial statements upon adoption.

In October 2021, the FASB issued ASU 2021-08, *Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers* ("ASU 2021-08"), which amends ASC 805, *Business Combinations (Topic 805)*, to add contract assets and contract liabilities to the list of exceptions to the recognition and measurement principles that apply to business combinations and to require that an acquiring entity recognize and measure contract assets and contract liabilities acquired in a business combination in accordance with ASC 606, *Revenue from Contracts with Customers (Topic 606)* ("ASC 606"). Under current GAAP, an acquirer generally recognizes such items at fair value on the acquisition date. While primarily related to contract assets and contract liabilities that were accounted for by the acquiree in accordance with ASC 606, ASU 2021-08 also applies to contract assets and contract liabilities from other contracts to which the provisions of ASC 606 apply, such as contract liabilities from the sale of nonfinancial assets within the scope of ASU 2017-05, *Other Income - Gains and Losses from the Derecognition of Nonfinancial Assets (Subtopic 610-20)*. ASU 2021-08 is effective for the Company January 1, 2023, with early adoption permitted. The Company believes that the adoption of ASU 2021-08 could have a material impact on its consolidated financial statements for periods including and subsequent to significant business acquisitions.

In January 2021 the FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848): Scope* ("ASU 2021-01"), which refines the scope of ASC 848, *Reference Rate Reform*, 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. The adoption of ASU 2021-01 did not have a material impact on the Company's consolidated financial statements.

(2) 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 diluted earnings (loss) per share were as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Weighted average shares outstanding - basic	150,190	147,467	149,681	146,706
Potential dilutive common shares	—	6,693	—	—
Weighted average shares outstanding - diluted	150,190	154,160	149,681	146,706

Options to purchase the Company's common stock and unvested restricted and performance-based stock units aggregating

15.4 million shares have not been included in the computation of loss per share for the three and six months ended June 30, 2022 because their effect would have been antidilutive. Options to purchase the Company's common stock aggregating 0.1 million shares have not been included in the computation of diluted earnings per share for the three months ended June 30, 2021 because their effect would have been antidilutive. Options to purchase the Company's common stock and unvested restricted and performance-based stock awards and stock units aggregating 12.1 million shares have not been included in the computation of diluted loss per share for the six months ended June 30, 2021 because their effect would have been antidilutive.

(3) INVENTORY

Inventory at June 30, 2022 and December 31, 2021 consisted of the following (in thousands):

	June 30, 2022	December 31, 2021
On-hand final assemblies and finished goods inventories	$ 72,954	$ 57,360
Deferred cost of goods sold	2,055	1,474
	75,009	58,834
Less noncurrent portion (included in other assets)	(10,361)	(4,791)
Current portion	$ 64,648	$ 54,043

(4) INTANGIBLE ASSETS AND GOODWILL

The Company's intangible assets at June 30, 2022 and December 31, 2021 consisted of the following (in thousands):

June 30, 2022	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	197,548	108,832
Customer relationships	11.86	268,140	91,949	176,191
Trade names	3.88	5,000	4,236	764
Internal use software	3.00	730	730	—
	9.17	$ 614,250	$ 294,463	$ 319,787

December 31, 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	181,393	124,987
Customer relationships	11.86	268,140	77,653	190,487
Trade names	3.88	5,000	3,744	1,256
Internal use software	3.00	730	730	—
	9.17	$ 614,250	$ 263,520	$ 350,730

* 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 June 30, 2022 was as follows (in thousands):

Years ending December 31,	
Remainder of 2022	$ 29,506
2023	53,966
2024	46,899
2025	40,338
2026	36,489
2027	31,634
Thereafter	80,955
	$ 319,787

There were no changes to the carrying value of the Company's goodwill in the six months ended June 30, 2022 and 2021. The components of goodwill at June 30, 2022 and 2021 were as follows (in thousands):

	Cloud and Edge	IP Optical Networks	Total
Balance at June 30, 2022			
Goodwill	$ 392,302	$ 191,996	$ 584,298
Accumulated impairment losses	(167,406)	(116,000)	(283,406)
	$ 224,896	$ 75,996	$ 300,892
Balance at June 30, 2021			
Goodwill	$ 392,302	$ 191,996	$ 584,298
Accumulated impairment losses	(167,406)	—	(167,406)
	$ 224,896	$ 191,996	$ 416,892

(5) INVESTMENTS AND FAIR VALUE HIERARCHY

The Company received debentures and warrants as sale consideration in connection with the sale of its Kandy Communications Business on December 1, 2020 to American Virtual Cloud Technologies, Inc. ("AVCT"). The debentures bore interest at a rate of 10% per annum (the "Debentures"), which was added to the principal amount of the Debentures. The Company recorded $1.2 million and $2.7 million of interest income in the three and six months ended June 30, 2021, which was added to the principal amount of the Debentures, and which is included in Interest expense, net, in the condensed consolidated statement of operations. On September 8, 2021 (the "Debenture Conversion Date"), the debentures were converted into 13,700,421 shares of AVCT common stock (the "Debenture Shares"). The warrants entitle the Company to purchase 4,377,800 shares of AVCT common stock at an exercise price of $0.01 per share, and expire on December 1, 2025 (the "Warrants"). The Company had not exercised any of the Warrants as of June 30, 2022. The Company's investment in AVCT (the "AVCT Investment") is comprised of the debentures and Warrants for periods prior to the Debenture Conversion Date and the Debenture Shares and Warrants for periods subsequent to the Debenture Conversion Date. The Company is recording the AVCT Investment at fair value, with changes in fair value recorded as a component of Other (expense) income, net, in the condensed consolidated statements of operations.

The fair values of the AVCT Investment, which are reported as Investments in the Company's condensed consolidated balance sheets, were $4.5 million and $43.9 million at June 30, 2022 and December 31, 2021, respectively. The Company recorded losses of $12.4 million and $39.4 million in the three and six months ended June 30, 2022, respectively, representing the change in the fair value of the AVCT Investment. The Company recorded a gain of $12.1 million and a loss of $11.8 million in the three and six months ended June 30, 2021, respectively, representing the change in the fair value of the AVCT Investment, which loss was partially offset by the paid-in-kind interest income described above. The AVCT Investment is classified as a Level 1 fair value measurement at both June 30, 2022 and December 31, 2021.

The Company evaluated the nature of its investment in AVCT at June 30, 2022 and December 31, 2021, and determined that it represented an equity interest on a diluted basis of approximately 9% and 15%, respectively. 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 it had neither significant influence nor a controlling interest arising from the AVCT Investment that would require consolidation as of June 30, 2022 or December 31, 2021.

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.

(6) ACCRUED EXPENSES AND OTHER

Accrued expenses at June 30, 2022 and December 31, 2021 consisted of the following (in thousands):

	June 30, 2022	December 31, 2021
Employee compensation and related costs	$ 31,323	$ 38,040
Professional fees	17,635	14,365
Other	50,993	48,347
	$ 99,951	$ 100,752

(7) WARRANTY ACCRUALS

The changes in the Company's accrual balance in the six months ended June 30, 2022 were as follows (in thousands):

Balance at January 1, 2022	$ 13,120
Current period provisions	2,676
Settlements	(2,838)
Balance at June 30, 2022	$ 12,958

(8) RESTRUCTURING AND FACILITIES CONSOLIDATION INITIATIVES

The Company recorded restructuring and related expense aggregating $2.9 million and $2.8 million in the three months ended June 30, 2022 and 2021, respectively, and $7.7 million and $8.8 million in the six months ended June 30, 2022 and 2021, respectively. Restructuring and related expense includes restructuring expense (primarily severance and related costs), 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 records a liability for the estimated future variable lease costs.

Restructuring and related expense for the three and six months ended June 30, 2022 and 2021 was comprised of the following (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Severance and related costs	$ 859	$ 1,926	$ 4,981	$ 2,595
Variable and other facilities-related costs	1,072	$ 904	1,764	2,817
Accelerated amortization of lease assets due to cease-use	963	$ —	963	3,368
	$ 2,894	$ 2,830	$ 7,708	$ 8,780

Accelerated Rent Amortization

Accelerated rent amortization of lease assets 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 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 15). The Company may incur additional future expense if it is unable to sublease other locations included in its restructuring initiatives.

2022 Restructuring Plan

On February 14, 2022, the Company's Board of Directors approved a strategic restructuring program (the "2022 Restructuring Plan") to streamline the Company's operations in order to support the Company's investment in critical growth areas. The 2022 Restructuring Plan is expected to include, among other things, charges related to a consolidation of facilities and a workforce reduction. Any positions eliminated in countries outside the United States are subject to local law and consultation requirements.

The Company recorded restructuring and related expense of $2.9 million and $7.1 million in the three and six months ended June 30, 2022, respectively, in connection with the 2022 Restructuring Plan. The amount for the three months ended June 30, 2022 was comprised of $1.1 million for variable and other facilities-related costs, $1.0 million for accelerated amortization of lease assets no longer being used with no ability or intent to sublease, and $0.8 million for severance and related costs for approximately 10 employees. The amount for the six months ended June 30, 2022 was comprised of $5.0 million for severance and related costs for approximately 60 employees, $1.1 million for variable and other facilities-related costs and $1.0 million for accelerated amortization of lease assets no longer being used with no ability or intent to sublease. A summary of the 2022 Restructuring Plan accrual activity for the six months ended June 30, 2022 is as follows (in thousands):

	Balance at January 1, 2022	Initiatives charged to expense	Cash payments	Net transfer to operating lease liability accounts exchange	Balance at June 30, 2022
Severance	$ —	$ 5,037	$ (1,810)	$ —	$ 3,227
Variable and other facilities-related costs	—	1,072	(728)	—	344
Accelerated amortization of lease assets due to cease-use	—	963	—	(963)	—
	$ —	$ 7,072	$ (2,538)	$ (963)	$ 3,571

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 $1.7 million at June 30, 2022 and $1.6 million at December 31, 2021.

(9) 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 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 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 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 as of August 18, 2020. 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 Facility). 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 Facility. The First Amendment also reduced the amount of Unrestricted Cash (as defined in the 2020 Credit Facility) 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.

On March 3, 2021 (the "Third Amendment 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 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 six months ended June 30, 2021. The Company was 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.

On March 10, 2022, the Borrower entered into a Fourth Amendment to the 2020 Credit Facility (the "Fourth Amendment") to increase the Maximum Consolidated Net Leverage Ratio (as defined in the 2020 Credit Facility) to 4.25:1.00 for the first quarter of 2022 and 4.50:1.00 for the second quarter of 2022, with reductions in subsequent quarters through the third quarter of 2023, when the ratio will be fixed at 3.00:1.00. In connection with the Fourth Amendment, the Company made a $15.0 million prepayment that was applied to the final payment due on the maturity date. Subsequent to the Fourth Amendment, the Company was required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $20 million per year for the next two years and $30 million in the following year, with the final payment approximating $285 million due on the maturity date.

On June 30, 2022, the Borrower entered into a Fifth Amendment to the 2020 Credit Facility (the "Fifth Amendment") to increase the Maximum Consolidated Net Leverage Ratio (as defined in the 2020 Credit Facility) to 5.25:1.00 for the second quarter of 2022, 5.00:1.00 for the third quarter of 2022, and 4.75:1.00 for the fourth quarter of 2022. Also, the Fifth Amendment reduced the minimum Consolidated Fixed Charge Coverage Ratio (as defined in the 2020 Credit Facility) to 1.10:1.00 for the second, third and fourth quarters of 2022 and increased the maximum rate at which loans bear interest if the Company's Consolidated Net Leverage Ratio for any quarter is greater than 4.50:1.00. Specifically, pursuant to the Fifth Amendment, loans incurred under the Senior Secured Credit Facilities bear interest, at the Borrower’s option, at either LIBOR plus a margin ranging from 1.50% to 4.50% per year, or the base rate (the highest of the Federal Funds Effective Rate (as defined in the Credit Agreement) 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 3.50% per year (such margins being referred to as the “Applicable Margin”). In addition, the Fifth Amendment allows the Company to incur junior secured or unsecured debt in an amount no less than $50 million, subject to certain conditions, including the requirement that 50% of the aggregate amount of such incurred debt (net of certain costs, fees and other amounts) must be applied to prepay the Senior Secured Credit Facilities, and compliance with certain leverage ratio-based covenant exceptions. In connection with the Fifth Amendment, the Company made a $10.0 million voluntary prepayment that was applied to the final payment due on the maturity date. Subsequent to the Fifth Amendment, the Company is required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $5.0 million per quarter through March 31, 2024 and $10.0 million in each of the three quarters thereafter, with the final payment approximating $275 million due on the maturity date in March 2025.

At June 30, 2022, the Company had an outstanding balance under the 2020 Term Loan of $340.5 million at an average interest rate of 4.4% and $4.3 million of letters of credit outstanding with an interest rate of 3.5%. At December 31, 2021, the Company had an outstanding 2020 Term Loan balance of $375.5 million at an average interest rate of 3.4% and $4.3 million of letters of credit outstanding with an interest rate of 2.5%. The Company was in compliance with all covenants of the 2020 Credit Facility at both June 30, 2022 and December 31, 2021.

Letters of Credit and Performance and Bid Bonds

The Company uses letters of credit and performance and bid bonds in the course of its business. At June 30, 2022, the Company had letters of credit, bank guarantees, and performance and bid bonds outstanding (collectively, "Guarantees") aggregating $25.4 million, comprised of the $4.3 million of letters of credit under the 2020 Credit Facility described above (the "Letters of Credit") and $21.1 million of bank guarantees and performance and bid bonds (collectively, the "Other Guarantees") under various uncommitted facilities. At December 31, 2021, the Company had Guarantees aggregating $30.1 million, comprised of the $4.3 million of Letters of Credit noted above and $25.8 million of Other Guarantees. At June 30, 2022 and December 31, 2021, the Company had cash collateral of $2.0 million and $2.6 million, respectively, supporting the Guarantees, which is reported as Restricted cash in the condensed consolidated balance sheets.

(10) 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 $340.5 million and $375.5 million at June 30, 2022 and December 31, 2021, respectively. The 2020 Revolving Credit Facility was undrawn at both June 30, 2022 and December 31, 2021. Borrowings under the 2020 Credit Facility have variable interest rates based on LIBOR (see Note 9). 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 June 30, 2022 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 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 six months ended June 30, 2022 and 2021, 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 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 June 30, 2022 that $8.0 million may be reclassified as a decrease to interest expense over the next twelve months.

The impact of the Company's derivative financial instrument on its condensed consolidated statements of comprehensive (loss) income for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Gain (loss) recognized in other comprehensive income (loss) on derivative (effective portion)	$ 3,916	$ (1,015)	$ 18,629	$ 4,875
Amount reclassified from accumulated other comprehensive income (loss) to interest expense (effective portion)	137	810	893	1,589
	$ 4,053	$ (205)	$ 19,522	$ 6,464

The fair values and locations in the condensed consolidated balance sheets at June 30, 2022 and December 31, 2021 of the Company's derivative assets (liabilities) designated as a hedging instrument were as follows (in thousands):

	Balance sheet location	June 30, 2022	December 31, 2021
Interest rate derivative - asset derivative	Other current assets	$ 8,032	$ —
Interest rate derivative - asset derivative	Other assets	13,301	3,865
Interest rate derivative - liability derivative	Accrued expenses and other	—	(2,054)
		$ 21,333	$ 1,811

The Company has classified the interest rate derivative aggregating $21.3 million and $1.8 million at June 30, 2022 and December 31, 2021, respectively, as Level 2 fair value measurements within the fair value hierarchy (see Note 5).

(11) 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 six months ended June 30, 2022 and 2021 was disaggregated as follows:

Three months ended June 30, 2022	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 53,743	$ 33,046	$ 11,360	$ 98,149
Europe, Middle East and Africa	28,528	18,700	6,545	53,773
Asia Pacific	23,004	9,371	4,158	36,533
Other	7,392	8,341	1,608	17,341
	$ 112,667	$ 69,458	$ 23,671	$ 205,796

Three months ended June 30, 2021	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 56,128	$ 32,816	$ 11,590	$ 100,534
Europe, Middle East and Africa	31,309	20,739	7,741	59,789
Asia Pacific	19,045	10,837	3,868	33,750
Other	6,647	8,045	2,445	17,137
	$ 113,129	$ 72,437	$ 25,644	$ 211,210

Six months ended June 30, 2022	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 85,683	$ 66,110	$ 22,005	$ 173,798
Europe, Middle East and Africa	52,938	36,442	13,356	102,736
Asia Pacific	45,394	19,796	7,605	72,795
Other	10,642	15,715	3,308	29,665
	$ 194,657	$ 138,063	$ 46,274	$ 378,994

Six months ended June 30, 2021	Product revenue	Service revenue (maintenance)	Service revenue (professional services)	Total revenue
United States	$ 92,940	$ 64,422	$ 22,752	$ 180,114
Europe, Middle East and Africa	59,517	40,394	14,651	114,562
Asia Pacific	44,627	20,585	9,671	74,883
Other	13,934	15,741	4,748	34,423
	$ 211,018	$ 141,142	$ 51,822	$ 403,982

The Company's product revenue from indirect sales through its channel partner program and from its direct sales program for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Indirect sales through channel partner program	$ 28,453	$ 27,114	$ 51,953	$ 47,277
Direct sales	84,214	86,015	142,704	163,741
	$ 112,667	$ 113,129	$ 194,657	$ 211,018

The Company's product revenue from sales to enterprise customers and from sales to service provider customers for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Sales to enterprise customers	$ 22,837	$ 24,522	$ 44,920	$ 47,190
Sales to service provider customers	89,830	88,607	149,737	163,828
	$ 112,667	$ 113,129	$ 194,657	$ 211,018

The Company's product revenue and service revenue components by segment for the three and six months ended June 30, 2022 and 2021 were as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Product revenue:				
Cloud and Edge	$ 64,125	$ 64,361	$ 101,760	$ 114,513
IP Optical Networks	48,542	48,768	92,897	96,505
Total product revenue	$ 112,667	$ 113,129	$ 194,657	$ 211,018
Service revenue:				
Maintenance:				
Cloud and Edge	$ 55,179	$ 57,986	$ 110,209	$ 112,659
IP Optical Networks	14,279	14,451	27,854	28,483
Total maintenance revenue	69,458	72,437	138,063	141,142
Professional services:				
Cloud and Edge	17,776	19,074	34,917	39,671
IP Optical Networks	5,895	6,570	11,357	12,151
Total professional services revenue	23,671	25,644	46,274	51,822
Total service revenue	$ 93,129	$ 98,081	$ 184,337	$ 192,964

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 three months ended June 30, 2022 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 six months ended June 30, 2022 were as follows (in thousands):

	Accounts receivable	Unbilled accounts receivable	Deferred revenue (current)	Deferred revenue (long-term)
Balance at January 1, 2022	$ 208,972	$ 73,945	$ 109,119	$ 20,619
Increase (decrease), net	(35,994)	11,193	(2,656)	(1,035)
Balance at June 30, 2022	$ 172,978	$ 85,138	$ 106,463	$ 19,584

The Company recognized approximately $66 million of revenue in the six months ended June 30, 2022 that was recorded as deferred revenue at December 31, 2021 and approximately $60 million of revenue in the six months ended June 30, 2021 that was recorded as deferred revenue at December 31, 2020. Of the Company's deferred revenue reported as long-term in its condensed consolidated balance sheet at June 30, 2022, the Company expects that approximately $8 million will be recognized as revenue in 2023, approximately $9 million will be recognized as revenue in 2024 and approximately $3 million will be recognized as revenue in 2025 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 June 30, 2022 and December 31, 2021, the Company had $3.8 million of deferred sales commissions capitalized.

(12) 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 its Session Border Controller ("SBC") products and its Network Transformation ("NTR") products.

The IP Optical Networks segment provides high-performance, secure solutions for IP networking and optical transport, supporting wireless networks including 5G, metro and edge aggregation, core networking, data center interconnect, legacy transformation 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.

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. Segment revenue and expenses included in the tables below represent direct revenue and expense attributable to each segment. Please see Note 4 for information regarding the allocation of goodwill between segments.

The CODM utilizes revenue and adjusted gross profit to measure and assess each segment's performance. The Company calculates adjusted gross profit by excluding from cost of revenue: amortization of acquired technology and stock-based compensation, and may also exclude other items in future periods that the Company believes are not part of the Company's core business. Adjusted gross profit is not a financial measure 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 gross profit or other results reported in accordance with U.S. GAAP. See below for a reconciliation of adjusted gross profit to gross profit, which is the most directly comparable U.S. GAAP measure.

The tables below provide information regarding revenue, adjusted gross profit, and depreciation expense by reportable segment for the three and six months ended June 30, 2022 and 2021 (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Segment revenue:				
Cloud and Edge	$ 137,080	$ 141,421	$ 246,886	$ 266,843
IP Optical Networks	68,716	69,789	132,108	137,139
Revenue	$ 205,796	$ 211,210	$ 378,994	$ 403,982

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Segment adjusted gross profit:				
Cloud and Edge	$ 93,379	$ 95,837	$ 161,672	$ 180,172
IP Optical Networks	19,660	33,152	38,269	59,626
Total segment adjusted gross profit	113,039	128,989	199,941	239,798
Stock-based compensation expense	(601)	(562)	(1,181)	(824)
Amortization of acquired technology	(7,888)	(9,700)	(16,155)	(19,761)
Gross profit	$ 104,550	$ 118,727	$ 182,605	$ 219,213

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Segment depreciation expense:				
Cloud and Edge	$ 2,685	$ 3,142	$ 5,400	$ 6,279
IP Optical Networks	1,203	1,107	2,373	2,196
Depreciation expense	$ 3,888	$ 4,249	$ 7,773	$ 8,475

(13) MAJOR CUSTOMERS

The following customer contributed 10% or more of the Company's revenue in the three and six months ended June 30, 2022 and 2021:

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Verizon Communications Inc.	20%	17%	17%	16%

At June 30, 2022, one customer accounted for 10% or more of the Company's accounts receivable balance, representing approximately 17% of total accounts receivable. At December 31, 2021, one customer accounted for 10% or more of the Company's accounts receivable balance, representing approximately 15% 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.

(14) 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.

At the Company's annual meeting of stockholders held on May 25, 2022, the Company's stockholders approved an amendment to the 2019 Plan to increase the number of shares of the Company's common stock authorized for issuance under the 2019 Plan by 10.0 million shares.

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.

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.

Each year, beginning in 2019 and continuing through 2022, the Company has granted certain of its executives (the "2022 PSUs", "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"). The 2019 PSUs earned were released on March 15, 2022; these releases are included in the table below.

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 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.

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.

Stock Options

The activity related to the Company's outstanding stock options for the six months ended June 30, 2022 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, 2022	184,169	$ 13.25		
Exercised	(355)	$ 1.95		
Expired	(7,804)	$ 17.00		
Outstanding at June 30, 2022	176,010	$ 13.11	2.13	$ 48
Vested or expected to vest at June 30, 2022	176,010	$ 13.11	2.13	$ 48
Exercisable at June 30, 2022	176,010	$ 13.11	2.13	$ 48

Both the total intrinsic value of options exercised and cash received in connection with those exercises was nominal in the three and six months ended June 30, 2022.

Restricted Stock Units

The activity related to the Company's RSUs for the six months ended June 30, 2022 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2022	5,389,611	$ 6.19
Granted	5,602,733	$ 3.12
Vested	(2,007,138)	$ 6.21
Forfeited	(449,298)	$ 5.13
Unvested balance at June 30, 2022	8,535,908	$ 4.23

The total grant date fair value of shares of restricted stock underlying RSUs that vested during the six months ended June 30, 2022 was $12.5 million.

Performance-Based Stock Units

The activity related to the Company's PSUs for the six months ended June 30, 2022 was as follows:

	Shares	Weighted Average Grant Date Fair Value
Unvested balance at January 1, 2022	4,987,876	$ 2.87
Granted	2,228,073	$ 2.26
Vested	(175,751)	$ 5.03
Forfeited	(365,530)	$ 7.81
Unvested balance at June 30, 2022	6,674,668	$ 2.19

The total grant date fair value of shares of restricted stock underlying PSUs that vested during the six months ended June 30, 2022 was $0.9 million.

Stock-Based Compensation

The condensed consolidated statements of operations include stock-based compensation for the three and six months ended June 30, 2022 and 2021 as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Product cost of revenue	$ 107	$ 93	$ 206	$ 120
Service cost of revenue	494	469	975	704
Research and development	1,240	1,160	2,446	1,787
Sales and marketing	1,480	1,752	2,851	3,626
General and administrative	1,078	1,316	2,176	3,613
	$ 4,399	$ 4,790	$ 8,654	$ 9,850

At June 30, 2022, there was $31.2 million, net of expected forfeitures, of unrecognized stock-based compensation expense related to unvested stock options and stock units. This expense is expected to be recognized over a weighted average period of approximately two years.

(15) 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 June 30, 2022 and December 31, 2021 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.

Certain leased facilities are being partially or fully vacated as part of the 2022 Restructuring Plan and for some of those facilities, the Company has no plans to enter into sublease agreements. Accordingly, the Company accelerated the amortization of those lease assets through the planned cease-use date of each facility, resulting in additional amortization expense of $1.0 million in the three and six months ended June 30, 2022. The Company also recorded expense of $0.3 million in the three and six months ended June 30, 2022 for all estimated future variable lease costs related to those facilities.

In connection with the 2019 Restructuring Plan, certain lease assets related to facilities were partially or fully vacated as the Company consolidated its facilities. The Company had no plans to enter into sublease agreements for some of those facilities. The Company ceased use of those 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 in the six months ended June 30, 2021. The Company also recorded expense of $1.4 million in the six months ended June 30, 2021 for all estimated future variable lease costs related to those facilities. The Company did not record expense for accelerated amortization or estimated future variable lease costs in connection with the 2019 Restructuring Plan in the three months ended June 30, 2021. The Company did not record expense for accelerated amortization or estimated future variable lease costs in connection with the 2019 Restructuring Plan in the three or six months ended June 30, 2022.

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 June 30, 2022 and December 31, 2021, the Company had accruals of $1.7 million and $1.6 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. The Company's right-of-use lease assets and lease liabilities at June 30, 2022 and December 31, 2021 were as follows (in thousands):

	Classification	June 30, 2022	December 31, 2021
Assets:			
Operating lease assets	Operating lease right-of-use assets	$ 46,951	$ 53,147
Finance lease assets*	Property and equipment, net	107	287
Total leased assets		$ 47,058	$ 53,434
Liabilities:			
Current:			
Operating	Operating lease liabilities	$ 16,078	$ 17,403
Finance	Accrued expenses and other	254	503
Noncurrent:			
Operating	Operating lease liabilities, net of current	48,052	55,196
Finance	Other long-term liabilities	—	64
Total lease liabilities		$ 64,384	$ 73,166

* Finance lease assets were recorded net of accumulated depreciation of $1.1 million and $1.8 million at June 30, 2022 and December 31, 2021, respectively.

The components of lease expense for the three and six months ended June 30, 2022 and 2021 were as follows (in thousands):

	Three months ended		Six months ended	
	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Operating lease cost*	$ 5,538	$ 5,194	$ 10,168	$ 14,031
Finance lease cost:				
Amortization of leased assets	88	180	180	409
Interest on lease liabilities	4	20	10	46
Short-term lease cost	3,123	3,270	6,841	6,562
Variable lease costs (costs excluded from minimum fixed lease payments)**	1,033	500	1,859	2,658
Sublease income	(447)	(199)	(937)	(475)
Net lease cost	$ 9,339	$ 8,965	$ 18,121	$ 23,231

* Operating lease costs for the three and six months ended June 30, 2022 included $1.0 million of accelerated amortization for certain assets partially or fully vacated with no intent or ability to sublease. Operating lease costs for the six months ended June 30, 2021 included $3.4 million of accelerated amortization for certain assets partially or fully vacated with no intent or ability to sublease. No such accelerated amortization was recorded in the three months ended June 30, 2021.

** Variable lease costs for the three and six months ended June 30, 2022 included accruals of $0.3 million for all future estimated variable expenses related to certain assets partially or fully vacated with no intent or ability to sublease. Variable lease costs for the six months ended June 30, 2021 included accruals of $1.4 million for all future estimated variable expenses related to certain assets partially or fully vacated with no intent or ability to sublease. No such variable costs were accrued in the three months ended June 30, 2021.

Cash flow information related to the Company's leases for the six months ended June 30, 2022 and 2021 was as follows (in thousands):

	Six months ended	
	June 30, 2022	June 30, 2021
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows for operating leases	$ 8,338	$ 10,997
Operating cash flows for finance leases	$ 10	$ 46
Financing cash flows for finance leases	$ 341	$ 507

Other information related to the Company's leases as of June 30, 2022 and December 31, 2021 was as follows:

	June 30, 2022	December 31 2021
Weighted average remaining lease term (years):		
Operating leases	6.25	
Finance leases	0.67	
Weighted average discount rate:		
Operating leases	5.78 %	5.
Finance leases	3.20 %	4.

Future minimum fixed lease payments under noncancelable leases at June 30, 2022 were as follows (in thousands):

	Operating leases	Finance leases
Remainder of 2022	$ 9,685	$ 194
2023	17,791	64
2024	10,792	—
2025	7,931	—
2026	6,902	—
2027 and beyond	24,551	—
Total lease payments	77,652	258
Less: interest	(13,522)	(4)
Present value of lease liabilities	$ 64,130	$ 254

(16) INCOME TAXES

The Company's income tax provisions for the six months ended June 30, 2022 and 2021 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 valuation allowance on its deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of the respective allowances.

Beginning in 2022, the Tax Cuts and Jobs Act of 2017 (the "TCJA") eliminates the option to deduct research and development expenditures currently and requires taxpayers to amortize them over a minimum of five years pursuant to IRC Section 174. Although Congress is considering legislation that would defer the amortization requirement to later years, the Company has no assurance that the provision will be repealed or otherwise modified. If this provision of the TCJA is not repealed or otherwise modified, it will materially reduce the Company's operating cash flows in 2022.

(17) 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 June 30, 2022, the Company's maximum possible future royalties commitment, including $4.1 million of unpaid royalties accrued, was $31.3 million, including interest of $2.0 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, but to date, the court has not ruled on the motion.

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, 2021, which was filed with the U.S. Securities and Exchange Commission on March 11, 2022.

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 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

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. Continued uncertain global economic conditions as a result of the continuing COVID-19 pandemic, particularly in areas experiencing higher case numbers as a result of new variants, 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 in part 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. The degree to which the continuing COVID-19 pandemic impacts our future business, financial position and results of operations will depend on developments beyond our control, including the effectiveness of vaccines over the long-term or with respect to new variants, the frequency and duration of future waves of infection, the extent of actions to contain or treat the virus, how quickly and to what extent normal economic and operating conditions can result after new future waves, and the severity and duration of the global economic downturn that has resulted from the pandemic.

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 2021, we reclassified amounts recorded for amortization of certain acquired intangible assets in prior presentations from Total operating expenses under the caption "Amortization of acquired intangible assets" to Total cost of revenue under the caption "Amortization of acquired technology" in the consolidated statements of operations. Our management believes this presentation aids in 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 condensed consolidated balance sheets or statements of cash flows.

This reclassification resulted in $9.7 million and $19.8 million of expense recorded to Amortization of acquired technology within Total cost of revenue in the three and six months ended June 30, 2021, respectively, and decreases to Amortization of acquired intangible assets within Total operating expenses of $9.7 million and $19.8 million. The increases to Total cost of revenue decreased our gross profit as a percentage of revenue ("gross margin") by approximately five percentage points in both the three and six months ended June 30, 2021, respectively.

Operating Segments

Our Chief Operating Decision Maker assesses 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"). For additional details regarding our operating segments, see Note 12 - Operating Segment Information to our condensed consolidated financial statements.

Financial Overview

Financial Results

We reported a loss from operations of $7.2 million for the three months ended June 30, 2022 and income from operations of $13.0 million for the three months ended June 30, 2021. We reported a loss from operations of $46.3 million for the six months ended June 30, 2022 and income from operations of $0.3 million for the six months ended June 30, 2021. The loss from operations in 2022 is primarily related to the impact from higher supply chain costs and the incremental investment in R&D within our IP Optical Networks segment.

Our revenue was $205.8 million and $211.2 million in the three months ended June 30, 2022 and 2021, respectively. Our gross profit and gross margin were $104.6 million and 50.8%, respectively, in the three months ended June 30, 2022, and $118.7 million and 56.2%, respectively, in the three months ended June 30, 2021. Our revenue was $379.0 million and $404.0 million in the six months ended June 30, 2022 and 2021, respectively. Our gross profit and gross margin were $182.6 million and 48.2%, respectively, in the six months ended June 30, 2022, and $219.2 million and 54.3%, respectively, in the six months ended June 30, 2021. The lower revenue in the first half of 2022 compared to 2021 is primarily related to lower SBC sales and lower service revenue from Service Provider VoIP Network Transformation projects completing in the first quarter.

Revenue from our Cloud and Edge segment was $137.1 million and $141.4 million in the three months ended June 30, 2022 and 2021, respectively. Gross profit and gross margin for this segment were $88.3 million and 64.4%, respectively, in the three months ended June 30, 2022, and $88.8 million and 62.8%, respectively, in the three months ended June 30, 2021. Revenue from our Cloud and Edge segment was $246.9 million and $266.8 million in the six months ended June 30, 2022 and 2021, respectively. Gross profit and gross margin for this segment were $151.0 million and 61.2%, respectively, in the six months ended June 30, 2022, and $166.4 million and 62.3%, respectively, in the six months ended June 30, 2021.

Revenue from our IP Optical Networks segment was $68.7 million and $69.8 million in the three months ended June 30, 2022 and 2021, respectively. Gross profit and gross margin for this segment were $16.3 million and 23.7%, respectively, in the three months ended June 30, 2022, and $29.9 million and 42.8%, respectively, in the three months ended June 30, 2021. Revenue from our IP Optical Networks segment was $132.1 million and $137.1 million in the six months ended June 30, 2022 and 2021, respectively. Gross profit and gross margin for this segment were $31.6 million and 23.9%, respectively, in the six months ended June 30, 2022, and $52.9 million and 38.5%, respectively, in the six months ended June 30, 2021. Gross margin in 2022 is lower than 2021 due to higher component and logistics costs, as well as increased investment in customer service to support our expanded global footprint.

Our operating expenses were $111.8 million and $105.8 million in the three months ended June 30, 2022 and 2021, respectively, and $228.9 million and $218.9 million in the six months ended June 30, 2022 and 2021, respectively. The increased operating expenses are primarily related to higher R&D investment in our IP Optical Networks segment to support the expansion of the portfolio. Operating expenses for the three months ended June 30, 2022 included $7.5 million of amortization of acquired intangible assets, $1.5 million of acquisition-, disposal- and integration-related expense, and $2.9 million of restructuring and related expense. Operating expenses for the three months ended June 30, 2021 included $7.5 million of amortization of acquired intangible assets, $1.1 million of acquisition-, disposal- and integration-related expense, and $2.8 million of restructuring and related expense. Operating expenses for the six months ended June 30, 2022 included $14.8 million of amortization of acquired intangible assets, $3.4 million of acquisition-, disposal- and integration-related expense, and $7.7 million of restructuring and related expense. Operating expenses for the six months ended June 30, 2021 included $13.2 million of amortization of acquired intangible assets, $2.2 million of acquisition-, disposal- and integration-related expense, and $8.8 million of restructuring and related expense.

We recorded stock-based compensation expense of $4.4 million and $4.8 million in the three months ended June 30, 2022 and 2021, respectively, and $8.7 million and $9.9 million in the six months ended June 30, 2022 and 2021, 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 six months ended June 30, 2022 compared to the three and six months ended June 30, 2021.

Restructuring and Cost Reduction Initiatives

2022 Restructuring Plan. In February 2022, our Board of Directors approved a strategic restructuring program (the "2022 Restructuring Plan") to streamline the Company's operations in order to support the Company's investment in critical growth areas. The 2022 Restructuring Plan is expected to include, among other things, charges related to a consolidation of facilities and a workforce reduction. Any positions eliminated in countries outside the United States are subject to local law and consultation requirements.

We recorded restructuring and related expense of $2.9 million and $7.1 million in the three and six months ended June 30, 2022, respectively, in connection with the 2022 Restructuring Plan. The amount for the three months ended June 30, 2022 was comprised of $1.1 million for variable and other facilities-related costs, $1.0 million for accelerated amortization of lease assets no longer being used with no ability or intent to sublease, and $0.8 million for severance and related costs for approximately 10 employees. The amount for the six months ended June 30, 2022 was comprised of $5.0 million for severance and related costs for approximately 60 employees, $1.1 million for variable and other facilities-related costs and $1.0 million for accelerated amortization of lease assets no longer being used with no ability or intent to sublease. We anticipate that we will record future expense for severance and facility consolidations aggregating approximately $13 million in connection with the 2022 Restructuring Plan.

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 $1.0 million and $3.4 million for accelerated rent amortization in the six months ended June 30, 2022 and 2021, respectively. We continue to evaluate our properties included in our restructuring plans 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 these initiatives.

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 our investment in American Virtual Cloud Technologies Inc. (the "AVCT Investment"), 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, 2022 through June 30, 2022. 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, 2021.

Results of Operations

Three and six months ended June 30, 2022 and 2021

Revenue. Revenue for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands, except percentages):

	Three months ended		Decrease from prior year	
	June 30, 2022	June 30, 2021	$	%
Product	$ 112,667	$ 113,129	$ (462)	(0.4)%
Service	93,129	98,081	(4,952)	(5.0)%
Total revenue	$ 205,796	$ 211,210	$ (5,414)	(2.6)%

	Six months ended				Decrease from prior year			
	June 30, 2022		June 30, 2021		$		%	
Product	$	194,657	$	211,018	$	(16,361)	(7.8)%	
Service		184,337		192,964		(8,627)	(4.5)%	
Total revenue	$	378,994	$	403,982	$	(24,988)	(6.2)%	

Segment revenue for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands):

	Three months ended June 30, 2022						Three months ended June 30, 2021					
	Cloud and Edge		IP Optical Networks		Total		Cloud and Edge		IP Optical Networks		Total	
Product	$	64,125	$	48,542	$	112,667	$	64,361	$	48,768	$	113,1
Service		72,955		20,174		93,129		77,060		21,021		98,0
Total revenue	$	137,080	$	68,716	$	205,796	$	141,421	$	69,789	$	211,2

	Six months ended June 30, 2022						Six months ended June 30, 2021					
	Cloud and Edge		IP Optical Networks		Total		Cloud and Edge		IP Optical Networks		Total	
Product	$	101,760	$	92,897	$	194,657	$	114,513	$	96,505	$	211,0
Service		145,126		39,211		184,337		152,330		40,634		192,9
Total revenue	$	246,886	$	132,108	$	378,994	$	266,843	$	137,139	$	403,9

Our product revenue in the three months ended June 30, 2022 was essentially flat for both of our segments compared to the three months ended June 30, 2021, with slightly higher sales in the Asia Pacific region. The decrease in our product revenue in the six months ended June 30, 2022 compared to the six months ended June 30, 2021 was primarily the result of lower sales of our Cloud and Edge SBC products, coupled with slightly lower sales of IP Optical Networks products, partially offset by higher sales of our Cloud and Edge network transformation products. Service revenue in our Cloud and Edge segment was lower in the first half of 2022 compared with 2021 due to a smaller number of Network Transformation projects completing during the period.

Revenue from indirect sales through our channel partner program was 25% and 24% of our product revenue in the three months ended June 30, 2022 and 2021, respectively, and 27% and 22% of our product revenue in the six months ended June 30, 2022 and 2021, respectively.

Revenue from sales to enterprise customers was 20% and 22% of our product revenue in the three months ended June 30, 2022 and 2021, respectively. These sales were made through both our direct sales team and indirect sales channel partners. Revenue from sales to enterprise customers was 23% and 22% of our product revenue in the six months ended June 30, 2022 and 2021, respectively. Cloud and Edge sales to Enterprise customers in the first half of 2022 were consistent with the same period of 2021. IP Optical sales to Enterprise customers declined modestly over the same period.

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 six months ended June 30, 2022 and 2021 was comprised of the following (in thousands, except percentages):

	Three months ended				Decrease from prior year		
	June 30, 2022		June 30, 2021		$		%
Maintenance	$	69,458	$	72,437	$	(2,979)	(4.1)%
Professional services		23,671		25,644		(1,973)	(7.7)%
	$	93,129	$	98,081	$	(4,952)	(5.0)%

	Six months ended		Decrease from prior year	
	June 30, 2022	June 30, 2021	$	%
Maintenance	$ 138,063	$ 141,142	$ (3,079)	(2.2)%
Professional services	46,274	51,822	(5,548)	(10.7)%
	$ 184,337	$ 192,964	$ (8,627)	(4.5)%

Segment service revenue for the three and six months ended June 30, 2022 and 2021 was comprised of the following (in thousands):

	Three months ended June 30, 2022			Three months ended June 30, 2021		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Maintenance	$ 55,179	$ 14,279	$ 69,458	$ 57,986	$ 14,451	$ 72,4[illegible]
Professional services	17,776	5,895	23,671	19,074	6,570	25,6[illegible]
Total service revenue	$ 72,955	$ 20,174	$ 93,129	$ 77,060	$ 21,021	$ 98,0[illegible]

	Six months ended June 30, 2022			Six months ended June 30, 2021		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Maintenance	$ 110,209	$ 27,854	$ 138,063	$ 112,659	$ 28,483	$ 141,1[illegible]
Professional services	34,917	11,357	46,274	39,671	12,151	51,8[illegible]
Total service revenue	$ 145,126	$ 39,211	$ 184,337	$ 152,330	$ 40,634	$ 192,9[illegible]

The decrease in maintenance revenue in the three and six months ended June 30, 2022 compared to the three and six months ended June 30, 2021 was attributable to lower revenue in our Cloud and Edge segment, reflecting timing variability in renewal timing.

The decrease in professional services revenue in the three months ended June 30, 2022 compared to the three months ended June 30, 2021 was primarily attributable to $1 million of lower revenue from each of our segments. The decrease in professional services revenue in the six months ended June 30, 2022 compared to the six months ended June 30, 2021 was primarily attributable to approximately $5 million of lower revenue from our Cloud and Edge segment, due to a fewer number of VoIP Network Transformation projects completing in the first quarter of 2022.

The following customer contributed 10% or more of our revenue in the three month periods ended June 30, 2022 and 2021:

	Three months ended		Six months ended	
Customer	June 30, 2022	June 30, 2021	June 30, 2022	June 30, 2021
Verizon Communications Inc.	20%	17%	17%	16%

Revenue from customers domiciled outside the United States was approximately 52% of revenue in both the three months ended June 30, 2022 and 2021 and 54% and 55% of revenue in the six months ended June 30, 2022 and 2021, 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 $11 million and $10 million at June 30, 2022 and December 31, 2021, respectively. Our deferred service revenue was $115 million and $120 million at June 30, 2022 and December 31, 2021, 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 will increase for 2022 compared to 2021 as a result of both increased customer spend and continued cross-selling opportunities.

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, manufacturing and services personnel and related costs, and amortization of acquired technology. Our cost of revenue, gross profit and gross margins for the three and six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	Three months ended		Increase (decrease) from prior year	
	June 30, 2022	June 30, 2021	$	%
Cost of revenue:				
Product	$ 58,151	$ 46,641	11,510	24.7 %
Service	35,207	36,142	(935)	(2.6)%
Amortization of acquired technology	7,888	9,700	(1,812)	(18.7)%
Total cost of revenue	$ 101,246	$ 92,483	8,763	9.5 %
Gross profit	$ 104,550	$ 118,727	$ (14,177)	(11.9)%
Gross margin	50.8 %	56.2 %		

	Six months ended		Increase (decrease) from prior year	
	June 30, 2022	June 30, 2021	$	%
Cost of revenue:				
Product	$ 109,360	$ 91,086	$ 18,274	20.1 %
Service	70,874	73,922	(3,048)	(4.1)%
Amortization of acquired technology	16,155	19,761	(3,606)	(18.2)%
Total cost of revenue	$ 196,389	$ 184,769	$ 11,620	6.3 %
Gross profit	$ 182,605	$ 219,213	$ (36,608)	(16.7)%
Gross margin	48.2 %	54.3 %		

Our segment cost of revenue, gross profit and gross margins for the three and six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	Three months ended June 30, 2022			Three months ended June 30, 2021		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 19,037	$ 39,114	$ 58,151	$ 19,112	$ 27,529	$ 46,64
Service	25,033	10,174	35,207	26,846	9,296	36,14
Amortization of acquired technology	4,760	3,128	7,888	6,627	3,073	9,70
Total cost of revenue	$ 48,830	$ 52,416	$ 101,246	$ 52,585	$ 39,898	$ 92,48
Gross profit	$ 88,250	$ 16,300	$ 104,550	$ 88,836	$ 29,891	$ 118,72
Gross margin	64.4 %	23.7 %	50.8 %	62.8 %	42.8 %	56.2 %

	Six months ended June 30, 2022			Six months ended June 30, 2021		
	Cloud and Edge	IP Optical Networks	Total	Cloud and Edge	IP Optical Networks	Total
Product	$ 36,036	$ 73,324	$ 109,360	$ 32,533	$ 58,553	$ 91,086
Service	49,932	20,942	70,874	54,685	19,237	73,922
Amortization of acquired technology	9,936	6,219	16,155	13,266	6,495	19,761
Total cost of revenue	$ 95,904	$ 100,485	$ 196,389	$ 100,484	$ 84,285	$ 184,769
Gross profit	$ 150,982	$ 31,623	$ 182,605	$ 166,359	$ 52,854	$ 219,213
Gross margin	61.2 %	23.9 %	48.2 %	62.3 %	38.5 %	54.3 %

Our gross margin decreased in the three and six months ended June 30, 2022 compared to the three and six months ended June 30, 2021 primarily due to lower margins in our IP Optical Networks segment. The decrease was primarily attributable to product and customer mix, higher component costs, and higher freight and logistics expenses, which decreased our gross margin by five percentage points and six percentage points, respectively. We anticipate improved gross margin in the second half of 2022 as elevated supply chain costs improve, and higher sales and better customer mix benefit from fixed operational costs further improving margins.

We believe that our consolidated gross margin may decrease in 2022 compared to 2021 as a result of higher expected sales from IP Optical Networks, which has lower margins due to the higher hardware content in its products, and higher production costs resulting from ongoing worldwide supply chain issues.

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 six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	June 30, 2022	June 30, 2021	Increase from prior year $	Increase from prior year %
Three months ended	$ 51,103	$ 46,797	$ 4,306	9.2 %
Six months ended	$ 103,793	$ 94,207	$ 9,586	10.2 %

The increase in our research and development expenses in the three months ended June 30, 2022 compared to the three months ended June 30, 2021 was primarily attributable to approximately $6 million of higher expenses in our IP Optical Networks segment partially offset by approximately $2 million of lower expenses in our Cloud and Edge segment.

The increase in our research and development expenses in the six months ended June 30, 2022 compared to the six months ended June 30, 2021 was primarily attributable to approximately $14 million of higher expenses in our IP Optical Networks segment partially offset by approximately $4 million of lower expenses in our Cloud and Edge segment.

The increased investment in IP Optical Networks R&D is focused on significantly expanding our portfolio of IP Routing solutions, adding additional features to our Optical Transport portfolio, and investment in a next generation SDN management and orchestration platform.

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 will increase modestly in 2022 compared to 2021, primarily due to our incremental investment in critical growth areas, partially offset by cost savings from the 2022 Restructuring Plan.

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 six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	June 30, 2022	June 30, 2021	Increase from prior year $	Increase from prior year %
Three months ended	$ 35,843	$ 34,881	$ 962	2.8 %
Six months ended	$ 73,462	$ 72,099	$ 1,363	1.9 %

The slight increase in sales and marketing expenses in the three months ended June 30, 2022 compared to the three months ended June 30, 2021 was primarily attributable to approximately $2 million of higher expenses in our IP Optical Networks segment, partially offset by approximately $1 million of lower expense in our Cloud and Edge segment, primarily for travel related costs. Our Sales and Marketing team is responsible for selling the entire portfolio of products and services, and expenses are allocated to each operating segment pro-rata based on revenue contribution.

The increase in sales and marketing expenses in the six months ended June 30, 2022 compared to the six months ended June 30, 2021 was primarily attributable to approximately $3 million of higher expenses in our IP Optical Networks segment, primarily offset by approximately $2 million of lower expenses in our Cloud and Edge segment, primarily for travel related costs.

We believe that our full year 2022 sales and marketing expenses will be consistent with 2021 levels.

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 six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	June 30, 2022	June 30, 2021	Increase (decrease) from prior year	
			$	%
Three months ended	$ 12,901	$ 12,734	$ 167	1
Six months ended	$ 25,763	$ 28,287	$ (2,524)	(8

Our general and administrative expenses were relatively flat in the three months ended June 30, 2022 compared to the three months ended June 30, 2021.

The decrease in general and administrative expenses in the six months ended June 30, 2022 compared to the six months ended June 30, 2021 was primarily attributable to lower employee-related expenses in the current year period of approximately $1 million in each of our Cloud and Edge and IP Optical Networks segments.

Although our general and administrative expenses decreased 9% in the six months ended June 30, 2022 compared to the six months ended June 30, 2021, we believe that our general and administrative expenses will decrease only slightly for the full year 2022 compared to our 2021 levels.

Amortization of Acquired Intangible Assets. Amortization of acquired intangible assets included in Operating expenses ("Opex Amortization") for the three and six months ended June 30, 2022 and 2021 was as follows (in thousands, except percentages):

	June 30, 2022	June 30, 2021	Increase from prior year	
			$	%
Three months ended	$ 7,513	$ 7,481	$ 32	(
Six months ended	$ 14,788	$ 13,243	$ 1,545	11

The increase in Opex Amortization in both the three and six months ended June 30, 2022 compared to the three and six months ended June 30, 2021 was primarily due to higher expense related to customer lists recorded in connection with the ECI Acquisition. Opex Amortization is not recorded on a straight-line basis; rather, it is recorded in relation to expected future cash flows. Accordingly, such expense may vary from one period to the next.

Acquisition-, Disposal- and Integration-Related. 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 were $1.5 million and $1.1 million in the three months ended June 30, 2022 and 2021, respectively, and $3.4 million and $2.2 million in the six months ended June 30, 2022 and 2021, respectively. The amounts for the three and six months ended June 30, 2022 primarily related to integration-related expenses. The amounts for the three and six months ended June 30, 2021 were primarily incurred for integration-related expenses and professional and services fees in connection with the sale of our Kandy Communications business to American Cloud Technologies, Inc. ("AVCT") on December 1, 2020 (the "Kandy Sale").

Restructuring and Related. 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 $2.9 million and $2.8 million in the three months ended June 30, 2022 and 2021, respectively, and $7.7 million and $8.8 million in the six months ended June 30, 2022 and 2021, 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.

Interest Expense, Net. Interest income and interest expense for the three and six months ended June 30, 2022 and 2021 were as follows (in thousands, except percentages):

	Three months ended		Increase (decrease) from prior year	
	June 30, 2022	June 30, 2021	$	%
Interest income	$ 59	$ 1,259	$ (1,200)	(95.3)%
Interest expense	(4,661)	(4,307)	354	8.2 %
Interest expense, net	$ (4,602)	$ (3,048)	$ 1,554	51.0 %

	Six months ended		Decrease from prior year	
	June 30, 2022	June 30, 2021	$	%
Interest income	$ 98	$ 2,744	$ (2,646)	(96.4)%
Interest expense	(8,701)	(11,611)	(2,910)	(25.1)%
Interest expense, net	$ (8,603)	$ (8,867)	$ (264)	(3.0)%

We recorded nominal interest income in the three and six months ended June 30, 2022. We received debentures (the "Debentures") and warrants in connection with the Kandy Sale. The Debentures bore interest at 10% per annum. We recorded $1.2 million and $2.7 million of interest income in the three and six months ended June 30, 2021, which was added to the principal amount of the Debentures, and which is included in Interest expense, net, in our condensed consolidated statement of operations for those periods. The Debentures were converted to shares of AVCT common stock on September 8, 2021.

Interest expense in the three and six months ended June 30, 2022 primarily represented interest and debt issuance costs in connection with the 2020 Credit Facility (as defined below). Interest expense in the three and six months ended June 30, 2021 was primarily comprised of interest and debt issuance costs in connection with the 2020 Credit Facility, including the write-off of $2.5 million of capitalized debt issuance costs in connection with the Third Amendment (as defined below).

Other (Expense) Income, Net. We recorded other expense, net, aggregating $10.2 million and other income, net of $17.2 million in the three months ended June 30, 2022 and 2021, respectively, and other expense, net, aggregating $39.0 million and $8.3 million in the six months ended June 30, 2022 and 2021, respectively. The primary component in all periods was gains and losses from the change in the fair value of the AVCT Investment, which were a loss of $12.4 million and a gain of $12.1 million in the three months ended June 30, 2022 and 2021, respectively, and losses of $39.4 million and $11.8 million in the six months ended June 30, 2022 and 2021, respectively.

Income Taxes. We recorded income tax provisions of $6.2 million and $4.7 million in the six months ended June 30, 2022 and 2021, 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.

Beginning in 2022, the Tax Cuts and Jobs Act of 2017 (the "TCJA") eliminates the option to deduct research and development expenditures currently and requires taxpayers to amortize them over a minimum of five years pursuant to IRC Section 174. Although Congress is considering legislation that would defer the amortization requirement to later years, we have no assurance that the provision will be repealed or otherwise modified. If this provision of the TCJA is not repealed or otherwise modified, it will materially reduce our operating cash flows in 2022.

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):

	Six months ended		
	June 30, 2022	June 30, 2021	Change
Net loss	$ (100,155)	$ (21,446)	$ (78,709)
Adjustments to reconcile net loss to cash flows (used in) provided by operating activities	76,911	64,343	12,568
Changes in operating assets and liabilities	(1,143)	(34,867)	33,724
Net cash (used in) provided by operating activities	$ (24,387)	$ 8,030	$ (32,417)
Net cash used in investing activities	$ (6,515)	$ (7,626)	$ 1,111
Net cash used in by financing activities	$ (38,362)	$ (20,858)	$ (17,504)

Our cash and restricted cash aggregated $38 million at June 30, 2022 and $106 million at December 31, 2021. These amounts included cash and restricted cash aggregating $36 million at June 30, 2022 and $60 million at December 31, 2021 held by our non-U.S. subsidiaries. If we elected to repatriate all excess funds held by our non-U.S. subsidiaries as of June 30, 2022, 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 9 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").

On March 10, 2022, we entered into a Fourth Amendment to the 2020 Credit Facility (the "Fourth Amendment") to increase the Maximum Consolidated Net Leverage Ratio (as defined in the 2020 Credit Facility) to 4.25:1.00 for the first quarter of 2022 and 4.50:1.00 for the second quarter of 2022, with reductions in subsequent quarters through the third quarter of 2023, when the ratio will be fixed at 3.00:1.00. In connection with the Fourth Amendment, we made a $15.0 million prepayment that was applied to the final payment due on the maturity date. Subsequent to the Fourth Amendment, we were required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $20 million per year for the next two years and $30 million in the following year, with the final payment approximating $285 million due on the maturity date.

On June 30, 2022, the we entered into a Fifth Amendment to the 2020 Credit Facility (the "Fifth Amendment") to increase the Maximum Consolidated Net Leverage Ratio (as defined in the 2020 Credit Facility) to 5.25:1.00 for the second quarter of 2022, 5.00:1.00 for the third quarter of 2022, and 4.75:1.00 for the fourth quarter of 2022. Also, the Fifth Amendment reduced the minimum Consolidated Fixed Charge Coverage Ratio (as defined in the 2020 Credit Facility) to 1.10:1.00 for the second, third and fourth quarters of 2022 and increased the maximum rate at which loans bear interest if our Consolidated Net Leverage Ratio for any quarter is greater than 4.50:1.00. Specifically, pursuant to the Fifth Amendment, loans incurred under the Senior

Secured Credit Facilities bear interest, at our option, at either LIBOR plus a margin ranging from 1.50% to 4.50% per year, or the base rate (the highest of the Federal Funds Effective Rate (as defined in the Credit Agreement) 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 3.50% per year (such margins being referred to as the “Applicable Margin”). In addition, the Fifth Amendment allows us to incur junior secured or unsecured debt in an amount no less than $50 million, subject to certain conditions, including the requirement that 50% of the aggregate amount of such incurred debt (net of certain costs, fees and other amounts) must be applied to prepay the Senior Secured Credit Facilities, and compliance with certain leverage ratio-based covenant exceptions. In connection with the Fifth Amendment, we made a $10.0 million voluntary prepayment that was applied to the final payment due on the maturity date. Subsequent to the Fifth Amendment, we are required to make quarterly principal payments on the 2020 Term Loan aggregating approximately $5.0 million per quarter through March 31, 2024 and $10.0 million in each of the three quarters thereafter, with the final payment approximating $275 million due on the maturity date in March 2025.

At June 30, 2022, we had an outstanding balance under the 2020 Term Loan of $340.5 million at an average interest rate of 4.4% and $4.3 million million of letters of credit outstanding with an interest rate of 3.5%. We were in compliance with all covenants of the 2020 Credit Facility at both June 30, 2022 and December 31, 2021.

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 June 30, 2022 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 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 six months ended June 30, 2022 and 2021, 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 six months ended June 30, 2022 and 2021, we recorded no hedge ineffectiveness.

Amounts reported in accumulated other comprehensive income 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 June 30, 2022 that $8.0 million may be reclassified as a decrease to interest expense over the next 12 months.

We use letters of credit, performance and bid bonds in the course of our business. At June 30, 2022, we had letters of credit, bank guarantees, and performance and bid bonds outstanding (collectively, "Guarantees") aggregating $25.4 million million, comprised of the $4.3 million of letters of credit under the 2020 Credit Facility described above (the "Letters of Credit") and $21.1 million of bank guarantees and performance and bid bonds (collectively, the "Other Guarantees") under various uncommitted facilities. At December 31, 2021, we had $30.1 million of Guarantees, comprised of $4.3 million of Letters of Credit and $25.8 million of Other Guarantees. At both June 30, 2022 and December 31, 2021, the Company had cash collateral of $2.0 million supporting the Guarantees, which is reported as Restricted cash in our condensed consolidated balance sheets.

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 for operating activities have been for personnel costs and investment in our research and development and in our sales and marketing, and general and administrative departments.

Cash used in operating activities in the six months ended June 30, 2022 was $24.4 million, primarily resulting from our net loss, higher inventory, and lower accrued expenses and deferred revenue. These amounts were partially offset by certain non-cash expenses, such as the decrease in the fair value of the AVCT Investment, amortization of intangible assets, depreciation and amortization of property and equipment, as well as lower accounts receivable.

Our operating activities provided $8.0 million of cash in the six months ended June 30, 2021 primarily the result of lower accounts receivable and other operating assets, and slightly higher deferred revenue, coupled with our non-cash operating activities. These amounts were partially offset by our net loss, lower accrued expenses and other long-term liabilities, lower accounts payable and higher inventory. Our lower accounts receivable reflected typical mid-year seasonality. 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.

Cash Flows from Investing Activities

Our investing activities used $6.5 million of cash in the six months ended June 30, 2022 to purchase property and equipment.

Our investing activities used $7.6 million of cash in the six months ended June 30, 2021, comprised of $10.6 million to purchase property and equipment, partially offset by $2.9 million of proceeds from the sale of our QualiTech business, which operated compliance testing laboratories in Israel for reliability and standardization testing for the high-tech industry, including testing medical equipment, military equipment and vehicles.

Cash Flows from Financing Activities

Our financing activities used $38.4 million of cash in the six months ended June 30, 2022, primarily due to $35.0 million of principal payments on the 2020 Credit Facility, including the voluntary $15.0 million incremental principal payment in connection with the Fourth Amendment, voluntary $10.0 million incremental principal payment in connection with the Fifth Amendment and $1.9 million for the payment of tax withholding obligations related to the net share settlement of restricted stock awards upon vesting. Payments of debt issuance costs and principal payments of finance leases totaled approximately $1.4 million.

Our financing activities used $20.9 million of cash in the six months ended June 30, 2021. We received $74.6 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. We used $12.1 million for the payment of tax withholding obligations related to the net share settlement of restricted stock awards upon vesting, and $82.1 million of principal payments of term debt, including the $74.6 million payoff of the Term B Loan in connection with the Third Amendment, $0.8 million of payments of debt issuance costs and $0.5 million for principal payments of finance leases.

Under the 2020 Credit Facility, we are required to maintain compliance with certain financial covenants. As of June 30, 2022, we were in compliance with our financial covenants. Due to the impact of market conditions on our forecast, including supply chain disruptions, higher costs, and other geopolitical instabilities and disputes, we project that we may not maintain compliance with our financial covenants under the 2020 Credit Facility, as amended, for the quarter ended September 30, 2022. Failure to remain in compliance would be an event of default that would permit the Lenders to accelerate the maturity of the 2020 Credit Facility. As of the date of the issuance of our condensed consolidated financial statements, we currently do not have sufficient cash on hand or available liquidity to repay the outstanding balance of $340.5 million as of June 30, 2022 in the event the debt was accelerated.

Management plans to avoid any potential event of default include raising additional cash that would allow us to pay down debt in order to remain in compliance with our financial covenants. In addition, we have the ability to sell our derivative financial instrument, which had an aggregate fair market value of $21 million as of June 30 2022. Lastly, we would evaluate the timing of our capital spending and extension of our payment terms with vendors as needed.

We believe our plans are probable of being successfully implemented, which along with our available cash on hand and liquidity from the factoring of receivables will result in adequate cash to allow us to pay down debt to meet our financial covenant requirements.

Based on our current expectations, we believe our current cash and available borrowings under the 2020 Credit Facility, along with management's plans as outlined above, 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, including our contractual obligations at June 30, 2022, primarily comprised of our debt principal and interest obligations as described above, and our operating lease and purchase obligations. Our operating lease obligations totaled $77.7 million at June 30, 2022, with payments aggregating $9.7 million in the remainder of 2022, $17.8 million in 2023, $10.8 million in 2024 and $39.4 million thereafter. Estimated payments for purchase obligations for the full year 2022 aggregate approximately $139 million. 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 deteriorates. 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

In March 2022, the FASB issued ASU 2022-02, *Financial Instruments – Credit Losses (Topic 326): Troubled Debt Restructurings and Vintage Disclosures* (“ASU 2022-02”), which eliminates the accounting guidance on troubled debt restructurings (TDRs) for creditors in ASC 310, *Receivables (Topic 310)*, and requires entities to provide disclosures about current period gross write-offs by year of origination. Also, ASU 2022-02 updates the requirements related to accounting for credit losses under ASC 326, *Financial Instruments – Credit Losses (Topic 326)*, and adds enhanced disclosures for creditors with respect to loan refinancings and restructurings for borrowers experiencing financial difficulty. ASU 2022-02 is effective for the Company January 1, 2023, with early adoption permitted. The Company believes that the adoption of ASU 2022-02 will not have a material impact on its consolidated financial statements upon adoption.

In October 2021, the FASB issued ASU 2021-08, *Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers* ("ASU 2021-08"), which amends ASC 805, *Business Combinations (Topic 805)*, to add contract assets and contract liabilities to the list of exceptions to the recognition and measurement principles that apply to business combinations and to require that an acquiring entity recognize and measure contract assets and contract liabilities acquired in a business combination in accordance with ASC 606, *Revenue from Contracts with Customers (Topic 606)* ("ASC 606"). Under current GAAP, an acquirer generally recognizes such items at fair value on the acquisition date. While primarily related to contract assets and contract liabilities that were accounted for by the acquiree in accordance with ASC 606, ASU 2021-08 also applies to contract assets and contract liabilities from other contracts to which the provisions of ASC 606 apply, such as contract liabilities from the sale of nonfinancial assets within the scope of ASU 2017-05, *Other Income - Gains and Losses from the Derecognition of Nonfinancial Assets (Subtopic 610-20)*. ASU 2021-08 is effective for us January 1, 2023, with early adoption permitted. We believe that the adoption of ASU 2021-08 could have a material impact on our consolidated financial statements for periods including and subsequent to significant business acquisitions.

In January 2021 the FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848): Scope* ("ASU 2021-01"), which refines the scope of ASC 848, *Reference Rate Reform*, 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. The adoption of ASU 2021-01 did not have a material impact on our consolidated financial statements.

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, 2021.

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 an asset of $21.3 million at June 30, 2022. Based upon projected forward rates, we estimate as of June 30, 2022 that $8.0 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 June 30, 2022.

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 June 30, 2022 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 17, "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 first quarter of 2021 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 six months ended June 30, 2022 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.

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	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
April 1, 2022 to April 30, 2022	5,277	$ 3.11	—	$ —
May 1, 2022 to May 31, 2022	985	$ 3.09	—	$ —
June 1, 2022 to June 30, 2022	42,060	$ 2.72	—	$ —
Total	48,322	$ 2.77	—	$ —

(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 second quarter of 2022, 48,322 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.

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).
10.1	Fifth Amendment to Credit Agreement, dated June 30, 2022, among Ribbon Communications Operating Company, Inc., as the borrower, the guarantors party thereto, the financial institutions party thereto as lenders, and Citizens Bank, N.A., as administrative agent (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed July 5, 2022 with the SEC).
10.2	Amendment No. 1 to the Ribbon Communications, Inc. Amended and Restated 2019 Incentive Award Plan (incorporated by reference to Appendix A to the Registrant's Definitive Proxy Statement on Schedule 14A filed on April 8, 2022 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)

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* 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: July 28, 2022	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: July 28, 2022

/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: July 28, 2022

/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 June 30, 2022 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: July 28, 2022

/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 June 30, 2022 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: July 28, 2022

/s/ Miguel A. Lopez

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