COWEN AND COMPANY

Equity Research

Industry Update

May 9, 2014

■ **Telecom & Networking Equipment**

Spring 2014 ONUG Conference Takeaways

Paul Silverstein
646.562.1340
paul.silverstein@cowen.com

Michael Leonard
646.562.1321
michael.leonard@cowen.com

The Cowen Insight

This note sets forth our takeaways from the Spring 2014 Quarterly ONUG (Open Networking Users Group) Conference which we attended May 5 – 6, 2014. The ONUG conference brings together leading IT executives, network architects and designers from the various ONUG member organizations and other end users to share experiences, plans and knowledge to advance the adoption and deployment of SDN.

We recently attended the Spring 2014 Quarterly ONUG (Open Network Users Group) Conference in New York on May 5 - 6, 2014. A community of IT executives who exchange ideas and best practices for implementing Open Networking and Software-Defined Networking (SDN) designs, ONUG has expanded from a large number of the largest investment banks and Fidelity to include a number of Fortune 500 companies from various industries.

The ONUG conference brings together leading IT executives, network architects and designers from the various ONUG member organizations and other end users to share experiences, plans and knowledge to advance the adoption and deployment of SDN. A number of SDN companies also attend the conference. As such, ONUG offers a forum for gaining perspective and insight as to the progression of SDN—in terms of timing, use cases, benefits, challenges and vendor positioning. Our key takeaways from the Spring 2014 ONUG conference follow.

SDN: Beyond the Data Center. While the early focus of SDN vendors and end users has been in the data center, the Spring 2014 ONUG conference highlighted the applicability of SDN beyond the data center. A number of the sessions focused on SDN in the Wide Area Network (WAN). A number of private companies have emerged that are focused on addressing open networking and SDN in the WAN. And more than one prominent organization has already commenced deployment of SDN WAN solutions. Among other interesting SDN WAN-focused suppliers, we were impressed by Glue Networks (see our note, "Takeaways From Day One of Cowen's Comm Equipment Forum," dated March 13, 2014) and Viptela. While relatively young companies founded in 2007 and 2012, respectively, both already have customers, including prominent, sizable Fortune 500 companies. Glue appears to be playing a significant role in providing intelligent WAN orchestration for Cisco's Application Centric Infrastructure (ACI) SDN architecture. Viptela, which just this week emerged from stealth mode, has an integrated routing, security and controller WAN solution.

SDN Progress. SDN continues to progress as measured by customer interest, use cases, number and nature of SDN vendors, Proof of Concepts, trial and deployments. At the same time, we believe that the SDN "game" has only just commenced. As one benchmark of the stage of progression, our checks suggest that few, if any, vendors have generated over $10 million of SDN revenue.

SDN Threat: Commoditization Is Not THE Issue. While commoditization and margin compression for Cisco and other established networking suppliers remains a long-term risk, we emerged from the conference with reinforced confidence that this risk is a long way off—measured in years. Almost without exception, the primary drivers of SDN deployment and vendor selection cited by conference participants were ease, agility and speed of service/application provisioning. While, not surprisingly, we once again heard many participants cite lower upfront equipment costs as an added desirable virtue, we did not hear any of the participants cite lower capex as the primary driver or even a significant driver of their SDN plans or adoption. Lower cost—and, as importantly, revenue generation—are products of greater ease, agility and speed of service/application provisioning. The secondary role of purchase price as a key SDN decision criteria should not be a surprise. A number of participants confirmed that the ratio of opex to capex within their organizations runs in the 9:1 range.

White Boxes: Light Threat. Consistent with the previous point, we emerged from the conference even more convinced that "white box" SDN vendors have precious little traction and pose negligible risk to incumbent suppliers. As previously noted, we are hard pressed to think of a single conference participant, or any other company that we have spoken to in the past two years, that have cited upfront equipment acquisition cost as the key driver of SDN deployment and vendor selection. On the other hand, we did hear from virtually every participant about the complexity, challenges and risks attending SDN deployment and aversion to risking their networks and application performance for the benefit of upfront cost savings. Further reducing the interest in and likelihood of significant migration to white box solutions, Cisco has significantly reduced the price of its ACI architecture, which naturally reduces the cost savings derived by shifting to white box suppliers.

Network/Application Visibility. Network and application visibility was one of the most prominent cited issues attending SDN adoption. A number of conference participants made clear that the ability to be able to monitor and analyze traffic flows is essential and SDN deployments at present raise significant challenges to monitoring and analysis. There appears to be a significant opportunity for vendors to address this need. While not in attendance, ExtraHop is one such company that we think is well positioned to meet this need. ExtraHop's platform analyzes all Layer 2-7 traffic, providing correlated, cross-tier visibility of network traffic.

Network Virtualization: At Present Virtual as Opposed to Substantive. While network virtualization—in the form of VMware's NSX platform—remains a prospective threat, we emerged from the conference with significantly enhanced confidence that this threat is a long way off from seeing substantive deployments and accordingly from having an adverse impact on physical networking equipment vendors. Putting aside the issue that network virtualization potentially could drive higher sales of physical switches and other networking infrastructure, we heard a number of issues cited at the conference by a number of the participants for why they are not proceeding with NSX deployments at present. A threshold issue cited by more than one Fortune 100 customer is that VMware's NSX pricing model is simply too expensive; according to these customers, their total cost of ownership would actually increase significantly. Other issues cited include limited scalability, stability and traffic visibility. All of these issues may yet be resolved over time, but at present they appear to be significant issues. To be clear, our checks indicate that, as one would expect, there is widespread "interest" in VMware's network virtualization approach. And under the rubric of "not one size fits all," we suspect a number of enterprises will adopt network virtualization. That said, our industry checks suggest to us that the timing and degree of impact is far less near and prominent than most investors appear to believe.

Cisco ACI: Significant Interest. While also not uniform, consistent with a number of our industry checks over the past several months, our conversations at the conference indicated significant interest among a large number of organizations in Cisco's ACI solution. We emphasize interest because all of these organizations indicated that they were waiting for the launch of Cisco's Application Policy Infrastructure Controller (APIC), currently scheduled to take place in the next couple of months, before making a decision. At present, prospective customers have only been able to see a simulation of the APIC. On a positive note, we have heard an increasing number of enterprises say that Cisco's ACI and Nexus 9000 represent a significant step up by Cisco in terms of both performance and pricing, which has caught their attention. As previously noted, Cisco appears to be aggressively pricing the Nexus 9000, at 30 - 35% less than its previous Nexus platforms. Cisco has adamantly maintained that the Nexus 9000 carries the same margin structure as its previous switching platforms. If true, the risk appears to be the challenge of making up the significantly lower ASP with significantly higher unit volume.

Ticker	Rating	Price*	Price Target	Ticker	Rating	Price*	Price Target
CSCO	Outperform	$23.02	$29.00				

*As of 05/08/2014

Valuation Methodology And Risks

Valuation Methodology

Data Networking & Wireline Equipment:
Our valuation methodology is based on Price to Earnings per Share (P/E) and in cases where the company lacks consistent positive earnings, Enterprise Value to Revenue (EV/Rev). In certain cases, our valuation is also informed by a discounted cash flow (DCF) analysis.

Investment Risks

Data Networking & Wireline Equipment:
(1) rapidly changing/disruptive technology, particularly software defined networking, network functions virtualization, and virtualization could have an adverse impact on demand and/or pricing; (2) deterioration in the macro environment both domestically and internationally could lead to a reduction in enterprise IT spending and service provider capital expenditures with a consequent adverse impact on Data Networking and Communication Equipment companies' revenue and valuation multiples; and (3) further consolidation among service providers or adverse regulatory changes on service providers could lead to a reduction in their capital expenditures.

Addendum

Stocks Mentioned In Important Disclosures

Ticker	Company Name
CSCO	Cisco Systems

Analyst Certification

Each author of this research report hereby certifies that (i) the views expressed in the research report accurately reflect his or her personal views about any and all of the subject securities or issuers, and (ii) no part of his or her compensation was, is, or will be related, directly or indirectly, to the specific recommendations or views expressed in this report.

Important Disclosures

Cowen and Company, LLC and or its affiliates make a market in the stock of Cisco Systems securities.

The author of this report wishes to acknowledge the contributions made by employees of CRISIL Global Research and Analytics, a business division of CRISIL Limited, a third-party provider of research services to Cowen and Company.

Cowen and Company, LLC compensates research analysts for activities and services intended to benefit the firm's investor clients. Individual compensation determinations for research analysts, including the author(s) of this report, are based on a variety of factors, including the overall profitability of the firm and the total revenue derived from all sources, including revenues from investment banking. Cowen and Company, LLC does not compensate research analysts based on specific investment banking transactions.

Disclaimer

This research is for our clients only. Our research is disseminated primarily electronically and, in some cases, in printed form. Research distributed electronically is available simultaneously to all Cowen and Company, LLC clients. All published research can be obtained on the Firm's client website, https://cowenlibrary.bluematrix.com/client/library.jsp.

Further information on any of the above securities may be obtained from our offices. This report is published solely for information purposes, and is not to be construed as an offer to sell or the solicitation of an offer to buy any security in any state where such an offer or solicitation would be illegal. Other than disclosures relating to Cowen and Company, LLC, the information herein is based on sources we believe to be reliable but is not guaranteed by us and does not purport to be a complete statement or summary of the available data. Any opinions expressed herein are statements of our judgment on this date and are subject to change without notice.

For important disclosures regarding the companies that are the subject of this research report, please contact Compliance Department, Cowen and Company, LLC, 599 Lexington Avenue, 20th Floor, New York, NY 10022. In addition, the same important disclosures, with the exception of the valuation methods and risks, are available on the Firm's disclosure website at https://cowen.bluematrix.com/sellside/Disclosures.action.

Price Targets: Cowen and Company, LLC assigns price targets on all covered companies unless noted otherwise. The price target for an issuer's stock represents the value that the analyst reasonably expects the stock to reach over a performance period of twelve months. The price targets in this report should be considered in the context of all prior published Cowen and Company, LLC research reports (including the disclosures in any such report or on the Firm's disclosure website), which may or may not include price targets, as well as developments relating to the issuer, its industry and the financial markets. For price target valuation methodology and risks associated with the achievement of any given price target, please see the analyst's research report publishing such targets.

Notice to UK Investors: This publication is produced by Cowen and Company, LLC which is regulated in the United States by FINRA. It is to be communicated only to persons of a kind described in Articles 19 and 49 of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005. It must not be further transmitted to any other person without our consent.

Copyright, User Agreement and other general information related to this report

Cowen and Company, LLC. New York (646) 562-1000 **Boston** (617) 946-3700 **San Francisco** (415) 646-7200 **Chicago** (312) 577-2240 **Cleveland** (440) 331-3531 **Atlanta** (866) 544-7009 **London** (affiliate) 44-207-071-7500

COWEN AND COMPANY RATING DEFINITIONS

Cowen and Company Rating System effective May 25, 2013

Outperform (1): The stock is expected to achieve a total positive return of at least 15% over the next 12 months

Market Perform (2): The stock is expected to have a total return that falls between the parameters of an Outperform and Underperform over the next 12 months

Underperform (3): Stock is expected to achieve a total negative return of at least 10% over the next 12 months

Assumption: The expected total return calculation includes anticipated dividend yield

Cowen and Company Rating System until May 25, 2013

Outperform (1): Stock expected to outperform the S&P 500

Neutral (2): Stock expected to perform in line with the S&P 500

Underperform (3): Stock expected to underperform the S&P 500

Assumptions: Time horizon is 12 months; S&P 500 is flat over forecast period

Cowen Securities, formerly known as Dahlman Rose & Company, Rating System until May 25, 2013

Buy – The fundamentals/valuations of the subject company are improving and the investment return is expected to be 5 to 15 percentage points higher than the general market return

Sell – The fundamentals/valuations of the subject company are deteriorating and the investment return is expected to be 5 to 15 percentage points lower than the general market return

Hold – The fundamentals/valuations of the subject company are neither improving nor deteriorating and the investment return is expected to be in line with the general market return

Cowen And Company Rating Definitions

Distribution of Ratings/Investment Banking Services (IB) as of 03/31/14

Rating	Count	Ratings Distribution	Count	IB Services/Past 12 Months
Buy (a)	407	57.08%	85	20.88%
Hold (b)	288	40.39%	8	2.78%
Sell (c)	18	2.52%	1	5.56%

(a) Corresponds to "Outperform" rated stocks as defined in Cowen and Company, LLC's rating definitions. (b) Corresponds to "Market Perform" as defined in Cowen and Company, LLC's ratings definitions. (c) Corresponds to "Underperform" as defined in Cowen and Company, LLC's ratings definitions.

Note: "Buy", "Hold" and "Sell" are not terms that Cowen and Company, LLC uses in its ratings system and should not be construed as investment options. Rather, these ratings terms are used illustratively to comply with FINRA and NYSE regulations.

Cisco Systems Rating History as of 05/08/2014

powered by: BlueMatrix

Legend for Price Chart:

I = Initation | 1 = Outperform | 2 = Market Perform | 3 = Underperform | UR = Price Target Under Review | T = Terminated Coverage | $xx = Price Target | NA = Not Available | S=Suspended

Points Of Contact

Analyst Profiles

Paul Silverstein
New York
646.562.1340
paul.silverstein@cowen.com

Paul Silverstein is a senior analyst covering networking and wireline equipment. He has covered the industry for the past 18 years.

Michael Leonard
New York
646.562.1321
michael.leonard@cowen.com

Michael Leonard is an associate on the data networking and wireline equipment team. He joined Cowen in August 2013.

Reaching Cowen

Main U.S. Locations

New York
599 Lexington Avenue
New York, NY 10022
646.562.1000
800.221.5616

Boston
Two International Place
Boston, MA 02110
617.946.3700
800.343.7068

Cleveland
20006 Detroit Road
Suite 100
Rocky River, OH 44116
440.331.3531

San Francisco
555 California Street, 5th Floor
San Francisco, CA 94104
415.646.7200
800.858.9316

Atlanta
3399 Peachtree Road NE
Suite 417
Atlanta, GA 30326
866.544.7009

Chicago
181 West Madison Street
Suite 1925
Chicago, IL 60602
312.577.2240

Houston
600 Travis Street
Suite 1970
Houston, TX 77002
281.657.6800

International Locations

Cowen International Limited

London
1 Snowden Street - 11th Floor
London EC2A 2DQ
United Kingdom
44.20.7071.7500

Cowen and Company (Asia) Limited

Hong Kong
Suite 1401 Henley Building
No. 5 Queens Road Central
Central, Hong Kong
852 3752 2333

@CowenResearch

Cowen and Company