# **FOCUS** Telecom Technology and Services Group Carrier-Focused Telecom Technology narien

# Winter 2017 Report

Vol.7, No.1



Strategic, Personal, Dedicated

**Investment Banking** 

# Investment Banking and Advisory Services

FOCUS Investment Banking LLC is a leading investment bank with specialized telecom technology and services expertise, concentrating on providing highly tailored services to emerging middle market and larger organizations in this sector:

Mergers & Acquisition Advisory **Corporate Development Consulting** Strategic Partnering & Alliances Capital Financing, Debt & Equity **Corporate Valuations** 

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16 FOCUS Telecom Technology and Services Team

# Carrier-Focused Telecom Technology Quarterly

By Richard Pierce, FOCUS Managing Director and Telecom Technology and Services Team Leader

The FOCUS Telecom Technology and Services group consists of four professionals with a mix of backgrounds that include both C-level operating expertise and experience at leading middle market investment banks. The FOCUS Telecom team is uniquely qualified to help middle market clients reach their strategic objectives because the group:

- Devotes significant senior level resources to executing transactions for lower middle market clients,
- Has a breadth of knowledge that covers most segments of the telecom industry,
- Has bankers with C-level operating experience in the telecom industry,
- Has a proven transaction methodology for delivering results,
- Is equally comfortable with buy side and sell side M&A,
- · Leverages an experienced team of research professionals,
- Has a national presence with coverage of both east and west coasts.

In 2016, members of the FOCUS Telecom team will be attending many conferences and meetings throughout the U.S. and are always delighted to receive introductions to innovative companies in the industry. We hope to see you at one of these events, and look forward to exploring your capital market needs as you continue to grow your enterprise.

#### Sub Sector Definitions

- Large Cap: Large, diversified companies with products across a variety of sub sectors
- **OSS/BSS Software:** Software systems that manage and bill the customer base and monitor and maintain tele-com networks
- IP Networking: Carrier Ethernet switching, routers and IP Multimedia Subsystem ("IMS") components
- Wireline Access and Transport: DSL equipment, PON equipment and WDM-based transport
- **Cable and Video:** Products such as headends and servers that support video delivery as well as broadband products for cable networks
- Broadband Wireless: High capacity, fixed wireless equipment
- **Test and Measurement:** Equipment used by both service providers and manufacturers to test and monitor networks and equipment

# Summary Comments

#### **Public Markets**

The FOCUS Carrier-Focused Telecom Technology Index (CFTTI) had a rough go of it in our Winter reporting period, dropping 6.2% in the past three months. This poor performance was in spite of a solid market backdrop, as both the S&P 500 and the NASDAQ were in positive territory for the three-month period. Unfortunately, the picture does not improve when we look at the 12-month period. The 5.6% drop in the CFTTI over this time frame compares poorly to 12 month gains of 5.7% in the S&P 500 and 4.2% in the NASDAQ. Sector multiples also are down compared to this same time last year. The CFTTI revenue multiple fell from 1.6x to 1.5x, while the EBITDA multiple dropped from 8.9x to 8.4x.

#### Large Cap

The Large Cap sub sector was our second worst performing sub sector for this most recent three-month period with a drop of 8.5%. Wireless vendors Ericsson and Nokia were particularly hard hit, falling 28.1% and 19.4%, respectively. On the plus side, Juniper was up just over 19%, while ZTE shot up nearly 15%. The Large Cap sub sector also is in negative territory for the full year, posting a drop of 7.0%. Once again. Ericsson and Nokia were the biggest losers, while over the past 12 months Cisco was the only company in the sub sector in positive territory. Sub sector multiples ended the period at 1.4x revenue and 7.7x EBITDA. Both are lower than year-ago multiples of 1.6x revenue and 8.3x EBITDA.

#### **OSS/BSS Software**

The OSS/BSS Software sub sector gained 1.3% in the past three months. Though modest, this gain was still enough to make it one of the better performing sub sectors in the CFTTI this reporting period. However, gains were not broad-based, as it was only gains at NetScout and Synchronoss that drove a positive performance for the sub sector. The other nine stocks in the index were all in negative territory. Over the past year, the sub sector is up 5.2%. This gain is more broad-based, with nearly half of the companies in the sub sector in the black. Sub sector multiple performance was mixed. On the down side, the sub sector revenue multiple went from 2.4x a year ago to 2.3x currently. However, the sub sector EBITDA multiple increased from 12.9x to 13.4x over this same time period.

#### **IP** Networking

The IP Networking sub sector relinquished its gains from our fall reporting period as it plummeted 12.6% in the past three months. This made it the worst performing sub sector for the current reporting period. Audiocodes was the sub sector's only stock in positive territory with a gain of 14.9% for the period. Every other stock was in negative territory, with particularly steep drops at SONUS Networks and Sandvine. Even with the negative performance in the current reporting period, the sub sector is still up 5.9% on a year-over-year basis. Furthermore, four of the six companies in the index are in positive territory over the past year. Sub sector multiples closed out the period at 1.7x revenue and 19.8x EBITDA. This means the sub sector revenue multiple remained steady compared to last year, while the EBITDA multiple dropped steeply.

#### Wireline Access and Transport

The Wireline Access and Transport sub sector more or less treaded water for the past three months with a decline of 0.2%. Though the loss was small, it still marks the sub sector's second straight reporting period in negative territory. Access-centric vendors ADTRAN and Calix both turned in positive returns, with a particularly strong gain at ADTRAN of 10.7%. Of the remaining companies in the sub sector, only Net Insight was in positive territory for the three month period. The picture for the sub sector is significantly bleaker when looked at over the full-year period. The sub sector has dropped nearly 30% over the past year, with nine of the 10 stocks in negative territory when measured over this time frame. As one might expect, sub sector multiples also are down. The sub sector revenue multiple is 1.2x (down from 1.7x a year ago) and the sub sector EBITDA multiple is 14.0x (down from 23.3x a year ago).

#### Cable and Video

The Cable and Video sub sector was another sub sector that managed to turn in a positive Winter reporting period, delivering a solid 2.4% three-month return. Amino was far and away the star performer with a gain of 18.6% for the period, but Arris and Harmonic also were both solidly in positive territory. The lone company to post a loss was SeaChange, which fell 10.6%. Even with gains in each of our last two reporting periods, the Cable and Video sub sector is still down 8.8% over the last 12 months. However, current sub sector multiples of 1.1x revenue and 10.1x EBITDA are roughly unchanged from where they were a year ago.

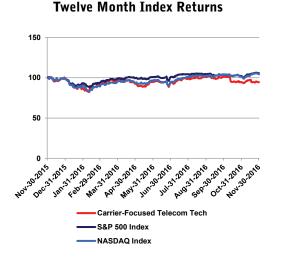
#### **Broadband Wireless**

The Broadband Wireless sub sector turned in a hat trick as its 8.5% increase made this the sub sector's third straight reporting period as the top performing sub sector in the CFTTI. Not surprisingly, sub sector leader Ubiquiti Networks posted a strong 8.9% return. However, Aviat Networks delivered an even stronger three-month return of 33.5%. Furthermore, the Broadband Wireless sub sector's 12-month return of nearly 60% makes it far and away the top performing sub sector in the CFTTI over this timeframe as well. Sub sector multiples continue to increase and ended the period at 3.5x revenue and 16.7x EBITDA. However, the high multiple is a bit misleading as Ubiquiti Networks is the only company in the sub sector trading at more than a turn of revenue.

#### Test and Measurement

The Test and Measurement sub sector once again had a strong reporting period as it was up 7.5% over the past three months. EXFO, Gigamon, and IXIA all posted double digit gains for the period. The sub sector also is up more than 20% year-over-year, and every company save Anritsu is up over this time period. The sub sector revenue multiple jumped from 1.1x a year ago to 1.7x currently, while the sub sector EBITDA multiple increased from 11.7x to 14.0x over the same time period.

#### **Carrier-Focused Telecom Technology: Public Market Summary**

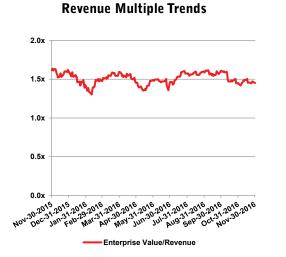


#### Sector and Sub Sector Returns

|                               | 12 Month | 3 Month |
|-------------------------------|----------|---------|
| Carrier-Focused Telecom Tech  | -5.6%    | -6.2%   |
| Large Cap                     | -7.0%    | -8.5%   |
| OSS/BSS                       | 5.2%     | 1.3%    |
| IP Networking                 | 5.9%     | -12.6%  |
| Wireline Access and Transport | -28.4%   | -0.2%   |
| Cable and Video               | -8.8%    | 2.4%    |
| Broadband Wireless            | 58.8%    | 8.5%    |
| Test and Measurement          | 21.1%    | 7.5%    |
| S&P 500                       | 5.7%     | 1.3%    |
| NASDAQ                        | 4.2%     | 2.1%    |

Source: Capital IQ

# Carrier-Focused Telecom Technology: Public Market Summary (continued)



#### Sector and Sub Sector Revenue Multiples

|                               | 11/30/2016 | 11/30/2015 |
|-------------------------------|------------|------------|
| Carrier-Focused Telecom Tech  | 1.5x       | 1.6x       |
| Large Cap                     | 1.4x       | 1.6x       |
| OSS/BSS                       | 2.3x       | 2.4x       |
| IP Networking                 | 1.7x       | 1.7x       |
| Wireline Access and Transport | 1.2x       | 1.7x       |
| Cable and Video               | 1.1x       | 1.1x       |
| Broadband Wireless            | 3.5x       | 2.1x       |
| Test and Measurement          | 1.7x       | 1.1x       |

**EBITDA Multiple Trends** 



Sector and Sub Sector EBITDA Multiples

|                               | 11/30/2016 | 11/30/2015 |
|-------------------------------|------------|------------|
| Carrier-Focused Telecom Tech  | 8.4x       | 8.9x       |
| Large Cap                     | 7.7x       | 8.3x       |
| OSS/BSS                       | 13.4x      | 12.9x      |
| IP Networking                 | 19.8x      | 57.5x      |
| Wireline Access and Transport | 14.0x      | 23.3x      |
| Cable and Video               | 10.1x      | 10.3x      |
| Broadband Wireless            | 16.7x      | 14.7x      |
| Test and Measurement          | 14.0x      | 11.7x      |

Source: Capital IQ

# Carrier-Focused Telecom Technology: M&A Summary Carrier-Focused Telecom Technology Stocks

# M&A

M&A activity in the CFTTI sector picked up somewhat from the anemic levels in our fall reporting period. However, activity still remains fairly slow. There were 16 transactions this period for a total announced dollar volume of slightly more than \$70 million. Neither of these are particularly high levels by historical standards, particularly the announced transaction dollar volume. We now stand at 59 transactions for all of 2016, which puts the year on pace to have the lowest number of transactions of any year in the last five. The picture is even worse when we look at announced transaction dollar volume. Year-todate, we only have slightly more than \$1.5 billion in total announced M&A dollar volume. This means 2016 could easily have less than half of the announced dollar volume of 2014, our next lowest year of the past five.

# **OSS/BSS Software**

After a relatively slow 2015 where it announced only a single acquisition, AMDOCS announced three acquisitions this period to bring its total number of acquisitions for 2016 up to four. Two of the company's transactions were billing related, while the final transaction helps telecom service providers offer personalized contextual interactions. In addition to the acquisitions made by Amdocs, private equity company Audax Group acquired roaming and analytics provider Mobileum. Finally, we noted the acquisition of BLiNQ Networks by Communication Components. BLiNQ provides self-organizing network solutions for small cell backhaul networks.

# **IP** Networking

There were two transactions in the IP Networking sub sector this reporting period. In the first of these, longtime switching vendor Taqua ended its career as a standalone company as it was acquired by fellow switching vendor SONUS Networks. In the sub sector's second transaction, diversified software company ENEA acquired deep packet inspection specialist Qosmos to bolster its presence in the telecom vertical.

# Wireline Access and Transport

We counted one acquisition in the access space and one in the transport space in our Winter reporting period. In the access transaction, ADTRAN acquired the EPON product line from Commscope. Commscope's EPON products allow for DOCSIS provisioning, and therefore strengthen ADTRAN's presence in the cable space. The second transaction also was focused on the cable industry as private equity-backed ATX Networks acquired cable network optical transport company InnoTrans.

# Cable and Video

There were no transactions in the Cable and Video sub sector this period.

# **Broadband Wireless**

There were no transactions in the Broadband Wireless sub sector this period.

### Test and Measurement

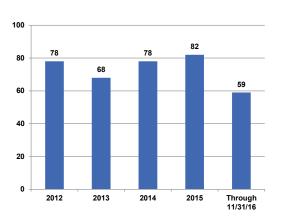
M&A activity in the Test and Measurement sub sector continued to pick up steam as the sub sector accounted for four transactions in the current reporting period. Three of these transactions were made by Anritsu, EXFO, and NetScout Sytsems; all large, publicly traded companies in the space. The final transaction in the sub sector was inked by private equity firm Ranch Creek Capital Partners as it acquired WAN emulation testing company Apposite Technology.

# Transactions with Multiples

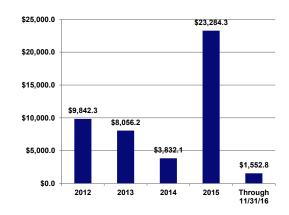
The only transaction with an announced multiple this reporting period was unfortunately not a particularly strong one. This was the SONUS Networks acquisition of Taqua for \$20 million, which represented a multiple of 0.7x revenue.

# Carrier-Focused Telecom Technology: M&A Summary

M&A Activity: Number of Transactions



### M&A Activity (\$ Value of Transactions in Millions)



# Announced Transactions (9/1/16 -11/30 /16)

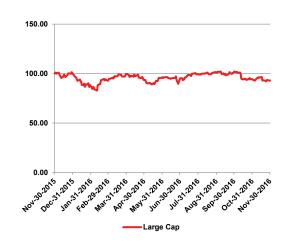
| Acquiror                        | Target  | Date<br>Announced | Sector                           | Purchase<br>Price | Description  |
|---------------------------------|---|-------------------|----------------------------------|-------------------|--|
| Carnegie Technologies           | Pravala Networks  | 11/30/16          | OSS/BSS Software                 | NA                | Connectivity software that improves and optimizes wireless networks for mobile devices and connected vehicles.                                 |
| Ranch Creek Capital<br>Partners | Apposite Technology   | 11/30/16          | Test and Measurement             | NA                | WAN emulation appliances that test the performance of applications in the lab<br>under a spectrum of real-world conditions.                    |
| Samsung                         | NewNet Communication<br>Technologies (Rich<br>Communication Business) | 11/15/16          | OSS/BSS Software                 | NA                | End-to-end GSMA-compliant RCS solution for mobile operators.   |
| Vodafone                        | RadioOpt  | 11/11/16          | OSS/BSS Software                 | NA                | Handset quality monitoring solution that measures parameters related to network and service quality.   |
| Audax Group                     | Mobileum  | 11/2/16           | OSS/BSS Software                 | NA                | Provides roaming and big data analytics solutions to telecom service providers.  |
| Communication<br>Components     | BLiNQ Networks  | 10/31/16          | OSS/BSS Software                 | NA                | Non-line-of-sight wireless backhaul self-organizing network solutions for outdoor small cell networks.   |
| EXFO                            | Absolute Analysis   | 10/31/16          | Test and Measurement             | \$8.3             | Testing, measurement and analytics systems for mobile device manufacturers, network equipment vendors and network operators.                   |
| NetScout Systems                | Avvasi  | 10/27/16          | Test and Measurement             | \$4.6             | Quality of experience driven streaming video analytics, traffic management and monetization solutions for mobile networks.                     |
| ENEA                            | Qosmos  | 10/24/16          | IP Networking                    | \$39.6            | Embedded deep packet inspection-based IP traffic classification and network<br>intelligence technology solutions.                              |
| Anritsu                         | Azimuth Systems   | 9/30/16           | Test and Measurement             | NA                | Wireless performance test solutions for network operators, device and module OEMs, chipset vendors and infrastructure providers.               |
| Sonus Networks                  | Taqua   | 9/26/16           | IP Networking                    | \$20.0            | Fixed and mobile converged switching, gateway, media processing and backhaul solutions for wireline, cable and wireless carriers.              |
| ATX Networks                    | InnoTrans   | 9/15/16           | Wireline Access and<br>Transport | NA                | Develops and manufactures optical transport solutions for cable operators.   |
| ADTRAN                          | CommScope (Fiber<br>Access Product Line)                              | 9/14/16           | Wireline Access and<br>Transport | NA                | Active EPON and 10G-EPON product platforms that deliver DOCSIS provisioning of EPON.   |
| Amdocs                          | Brite:Bill  | 9/14/16           | OSS/BSS Software                 | NA                | Billing solution that provides operators with a personalized, digital, interactive billing experience in the channel of the customer's choice. |
| Amdocs                          | Pontis  | 9/14/16           | OSS/BSS Software                 | NA                | Decisioning and learning technology that enables service providers to offer their<br>customers personalized contextual interactions.           |
| Amdocs                          | Vindicia  | 9/14/16           | OSS/BSS Software                 | NA                | Provider of software-as-a-service subscription management and payment solutions.   |

# Announced Transactions with Revenue Multiples (12/1/15 - 11/30/16)

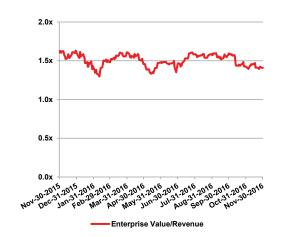
| Acquiror       | Target  | Date<br>Announced | Sector           | Purchase<br>Price | Revenue<br>Multiple | EBITDA<br>Multiple | Description   |
|----------------|---|-------------------|------------------|-------------------|---------------------|--------------------|---|
| Sonus Networks | Taqua   | 9/26/16           | IP Networking    | \$20.0            | 0.7 x               | NA                 | Fixed and mobile converged switching, gateway, media<br>processing and backhaul solutions for wireline, cable and<br>wireless carriers. |
| DHC Software   | Cloud Vision Networks<br>Technology Corporation | 6/16/16           | Cable and Video  | \$89.3            | 2.3 x               | NA                 | Cable network and digital TV related products including fiber-to-<br>the business, fiber-to-the node and Ethernet over copper.          |
| Siris Capital  | Xura  | 5/23/16           | OSS/BSS Software | \$691.1           | 2.6 x               | NM                 | Digital communications solutions for communication service<br>providers, enterprises and application providers.                         |
| CLX            | mBlox   | 5/13/16           | OSS/BSS Software | \$117.0           | 0.8 x               | NA                 | Mobile business-to-consumer engagement solutions including a web-based dashboard to create and send messages.                           |
| Agile Content  | Over the Top Networks                           | 5/10/16           | Cable and Video  | \$7.9             | 1.1 x               | NA                 | Provides OTT set-top hardware and related video-on-demand software.   |

# Sub Sector Analysis: Large Cap

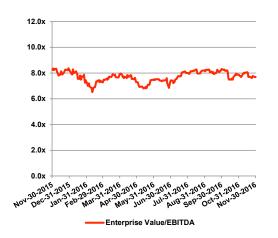
**Twelve Month Index Returns** 



#### **Revenue Multiple Trends**



**EBITDA Multiple Trends** 



**Company Returns** 

|                 | 12 Month | 3 Month |
|-----------------|----------|---------|
| Large Cap Index | -7.0%    | -8.5%   |
| Cisco           | 9.4%     | -5.2%   |
| Ericsson        | -47.2%   | -28.1%  |
| Juniper         | -8.6%    | 19.3%   |
| Nokia           | -40.6%   | -19.4%  |
| ZTE             | -3.7%    | 14.7%   |

#### **Company Revenue Multiples**

|                 | 11/30/2016 | 11/30/2015 |
|-----------------|------------|------------|
| Large Cap Index | 1.4x       | 1.6x       |
| Cisco           | 2.3x       | 2.1x       |
| Ericsson        | 0.6x       | 1.0x       |
| Juniper         | 2.1x       | 2.5x       |
| Nokia           | 0.9x       | 1.8x       |
| ZTE             | 0.7x       | 0.9x       |

#### **Company EBITDA Multiples**

|                 | 11/30/2016 | 11/30/2015 |
|-----------------|------------|------------|
| Large Cap Index | 7.7x       | 8.3x       |
| Cisco           | 7.6x       | 7.2x       |
| Ericsson        | 4.8x       | 7.2x       |
| Juniper         | 9.6x       | 11.8x      |
| Nokia           | 9.1x       | 12.1x      |
| ZTE             | 318.0x     | 19.5x      |

Source: Capital IQ

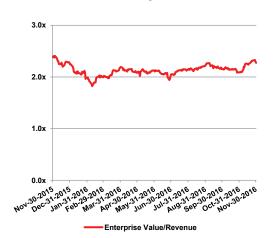
# Sub Sector Analysis: OSS/BSS Software



#### **Company Returns**

|                  | 12 Month | 3 Month |
|------------------|----------|---------|
| OSS/BSS Index    | 5.2%     | 1.3%    |
| Amdocs           | 4.2%     | -1.9%   |
| Astellia         | -32.2%   | -12.0%  |
| Comptel          | 34.2%    | -10.7%  |
| CSG Systems      | 24.5%    | 1.8%    |
| Evolving Systems | -30.0%   | -3.7%   |
| NetScout Systems | -5.7%    | 5.5%    |
| Radcom           | 65.1%    | -0.6%   |
| Redknee          | -46.7%   | -14.4%  |
| Subex            | -34.7%   | -15.5%  |
| Synchronoss      | 23.1%    | 16.1%   |
| Tecnotree        | -6.5%    | -11.5%  |

**Revenue Multiple Trends** 

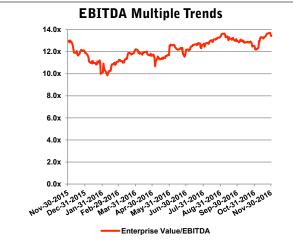




|                  | 11/30/2016 | 11/30/2015 |
|------------------|------------|------------|
| OSS/BSS Index    | 2.3x       | 2.4x       |
| Amdocs           | 2.1x       | 2.1x       |
| Astellia         | 0.4x       | 0.4x       |
| Comptel          | 2.3x       | 1.8x       |
| CSG Systems      | 2.1x       | 1.7x       |
| Evolving Systems | 1.8x       | 2.6x       |
| NetScout Systems | 2.5x       | 5.3x       |
| Radcom           | 7.0x       | 3.9x       |
| Redknee          | 1.2x       | 1.5x       |
| Subex            | 2.0x       | 2.7x       |
| Synchronoss      | 3.8x       | 3.2x       |
| Tecnotree        | 0.6x       | 0.5x       |

#### **Company EBITDA Multiples**

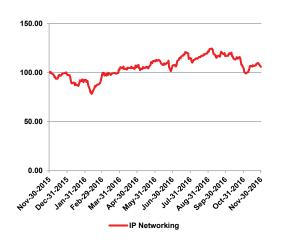
|                  | 11/30/2016 | 11/30/2015 |
|------------------|------------|------------|
| OSS/BSS Index    | 13.4x      | 12.9x      |
| Amdocs           | 11.3x      | 10.7x      |
| Astellia         | 23.8x      | NM         |
| Comptel          | 18.6x      | 21.7x      |
| CSG Systems      | 9.4x       | 9.5x       |
| Evolving Systems | 6.2x       | 10.7x      |
| NetScout Systems | 24.6x      | 35.1x      |
| Radcom           | NM         | 24.1x      |
| Redknee          | 720.0x     | 12.9x      |
| Subex            | 8.8x       | 10.1x      |
| Synchronoss      | 18.3x      | 11.2x      |
| Tecnotree        | 6.6x       | 3.8x       |



Source: Capital IQ

# Sub Sector Analysis: IP Networking

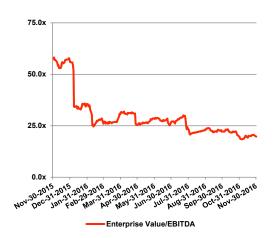
#### **Twelve Month Index Returns**



#### **Revenue Multiple Trends**



# **EBITDA Multiple Trends**



#### **Company Returns**

|                      | 12 Month | 3 Month |
|----------------------|----------|---------|
| IP Networking Index  | 5.9%     | -12.6%  |
| Allot Communications | -11.9%   | -10.7%  |
| Audiocodes           | 42.9%    | 14.9%   |
| Broadsoft            | 3.7%     | -9.2%   |
| Radisys              | 57.7%    | -14.9%  |
| Sandvine             | 11.3%    | -16.8%  |
| SONUS Networks       | -14.3%   | -30.0%  |

#### **Company Revenue Multiples**

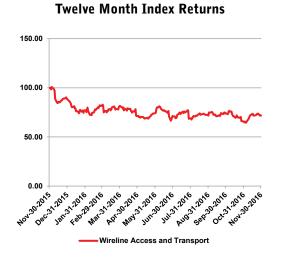
|                      | 11/30/2016 | 11/30/2015 |
|----------------------|------------|------------|
| IP Networking Index  | 1.7x       | 1.7x       |
| Allot Communications | 0.5x       | 0.5x       |
| Audiocodes           | 1.3x       | 1.1x       |
| Broadsoft            | 3.7x       | 4.2x       |
| Radisys              | 0.7x       | 0.5x       |
| Sandvine             | 1.8x       | 1.6x       |
| SONUS Networks       | 0.8x       | 1.0x       |

#### **Company EBITDA Multiples**

|                      | 11/30/2016 | 11/30/2015 |
|----------------------|------------|------------|
| IP Networking Index  | 19.8x      | 57.5x      |
| Allot Communications | NM         | NM         |
| Audiocodes           | 19.4x      | 29.2x      |
| Broadsoft            | 30.5x      | 50.7x      |
| Radisys              | 36.9x      | NM         |
| Sandvine             | 5.2x       | 4.6x       |
| SONUS Networks       | 30.5x      | NM         |

Source: Capital IQ

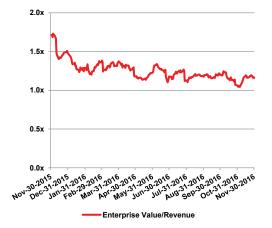
# Sub Sector Analysis: Wireline Access and Transport



# **Company Returns**

| 12 Month | 3 Month  |  |
|----------|--|--|
| -28.4%   | -0.2%  |  |
| 24.8%    | 10.7%  |  |
| -39.7%   | -7.3%  |  |
| -16.3%   | -13.4%   |  |
| -4.7%    | 1.5%   |  |
| -14.3%   | 0.0%   |  |
| -36.5%   | -10.2%   |  |
| NA       | NA   |  |
| -62.3%   | -0.9%  |  |
| -44.9%   | -36.5%   |  |
| 50.0%    | 8.9%   |  |
|          | -28.4%<br>24.8%<br>-39.7%<br>-16.3%<br>-4.7%<br>-14.3%<br>-36.5%<br>NA<br>-62.3%<br>-44.9% |  |

**Revenue Multiple Trends** 



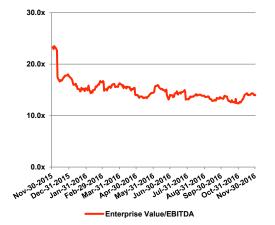
### **Company Revenue Multiples**

|                                   | 11/30/2016 | 11/30/2015 |
|-----------------------------------|------------|------------|
| Wireline Access & Transport Index | 1.2x       | 1.7x       |
| ADTRAN                            | 1.5x       | 1.2x       |
| ADVA                              | 0.6x       | 1.3x       |
| BATM                              | 0.5x       | 0.6x       |
| Calix                             | 0.7x       | 0.7x       |
| CIENA                             | 1.3x       | 1.6x       |
| Communications Systems            | 0.3x       | 0.6x       |
| Dasan Zhone Solutions             | 0.6x       | NA         |
| Infinera                          | 1.2x       | 3.7x       |
| MRV Communications                | 0.4x       | 3.0x       |
| Net Insight                       | 5.5x       | 4.5x       |

#### **Company EBITDA Multiples**

|                                   | 11/30/2016 | 11/30/2015 |
|-----------------------------------|------------|------------|
| Wireline Access & Transport Index | 14.0x      | 23.3x      |
| ADTRAN                            | 19.0x      | 24.4x      |
| ADVA                              | 10.3x      | 15.0x      |
| BATM                              | 36.9x      | 80.7x      |
| Calix                             | NM         | 29.9x      |
| CIENA                             | 10.9x      | 14.1x      |
| Communications Systems            | NM         | NM         |
| Dasan Zhone Solutions             | NM         | NA         |
| Infinera                          | 11.0       | 33.9x      |
| MRV Communications                | NM         | NM         |
| Net Insight                       | 55.4x      | 51.5x      |

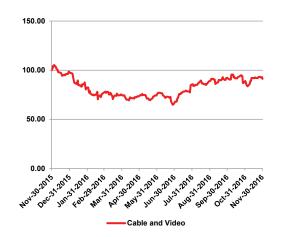
#### **EBITDA Multiple Trends**



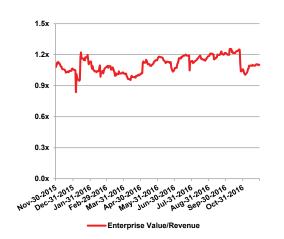
Source: Capital IQ

# Sub Sector Analysis: Cable and Video

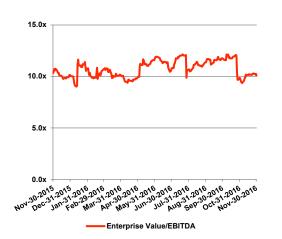
### **Twelve Month Index Returns**



#### **Revenue Multiple Trends**



#### **EBITDA Multiple Trends**



#### **Company Returns**

|                       | 12 Month | 3 Month |
|-----------------------|----------|---------|
| Cable and Video Index | -8.8%    | 2.4%    |
| Amino                 | 61.3%    | 18.6%   |
| Arris                 | -6.1%    | 2.2%    |
| Harmonic              | -15.9%   | 7.1%    |
| NetGem                | -14.2%   | 0.0%    |
| SeaChange             | -62.6%   | -10.6%  |

#### **Company Revenue Multiples**

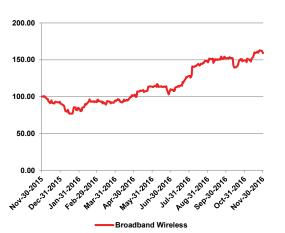
|                       | 11/30/2016 | 11/30/2015 |
|-----------------------|------------|------------|
| Cable and Video Index | 1.1x       | 1.1x       |
| Amino                 | 2.1x       | 2.4x       |
| Arris                 | 1.1x       | 1.1x       |
| Harmonic              | 1.2x       | 1.0x       |
| NetGem                | 0.6x       | 0.8x       |
| SeaChange             | 0.5x       | 1.5x       |

### **Company EBITDA Multiples**

|                       | 11/30/2016 | 11/30/2015 |
|-----------------------|------------|------------|
| Cable and Video Index | 10.1x      | 10.3x      |
| Amino                 | 22.2x      | 17.3x      |
| Arris                 | 9.1x       | 9.3x       |
| Harmonic              | NM         | 25.9x      |
| NetGem                | 6.5x       | 30.3x      |
| SeaChange             | NM         | NM         |

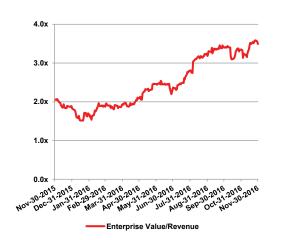
Source: Capital IQ

# Sub Sector Analysis: Broadband Wireless



# **Twelve Month Index Returns**

#### **Revenue Multiple Trends**



#### **EBITDA Multiple Trends**



#### **Company Returns**

|                          | 12 Month | 3 Month |
|--------------------------|----------|---------|
| Broadband Wireless Index | 58.8%    | 8.5%    |
| Aviat Networks           | 13.2%    | 33.5%   |
| Ceragon Networks         | 64.3%    | -3.4%   |
| DragonWave               | -15.5%   | -1.7%   |
| Redline Communications   | -33.3%   | -18.9%  |
| Ubiquiti Networks        | 60.4%    | 8.9%    |

#### **Company Revenue Multiples**

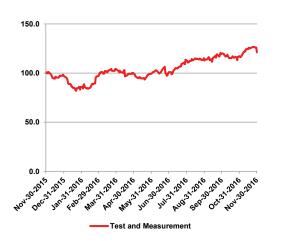
|                          | 11/30/2016 | 11/30/2015 |
|--------------------------|------------|------------|
| Broadband Wireless Index | 3.5x       | 2.1x       |
| Aviat Networks           | 0.2x       | 0.1x       |
| Ceragon Networks         | 0.6x       | 0.3x       |
| DragonWave               | 0.7x       | 0.4x       |
| Redline Communications   | 0.7x       | 0.7x       |
| Ubiquiti Networks        | 5.9x       | 4.4x       |

#### **Company EBITDA Multiples**

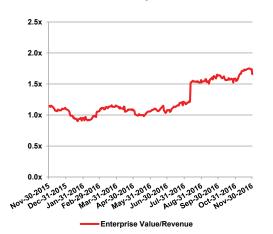
|                          | 11/30/2016 | 11/30/2015 |
|--------------------------|------------|------------|
| Broadband Wireless Index | 16.7x      | 14.7x      |
| Aviat Networks           | NM         | NM         |
| Ceragon Networks         | 6.5x       | 25.7x      |
| DragonWave               | NM         | NM         |
| Redline Communications   | NM         | 16.6x      |
| Ubiquiti Networks        | 15.9x      | 13.4x      |

Source: Capital IQ

### **Twelve Month Index Returns**



#### **Revenue Multiple Trends**



#### **EBITDA Multiple Trends**



#### **Company Returns**

|                            | 12 Month | 3 Month |
|----------------------------|----------|---------|
| Test and Measurement Index | 21.1%    | 7.5%    |
| Anritsu                    | -29.8%   | 1.6%    |
| EXFO                       | 26.8%%   | 34.5%   |
| Gigamon                    | 96.9%    | 20.7%   |
| Ixia                       | 5.3%     | 19.3%   |
| Spirent                    | 15.9%    | -5.9%   |
| Viavi                      | 23.4%    | 0.9%    |

#### **Company Revenue Multiples**

|                            | 11/30/2016 | 11/30/2015 |
|----------------------------|------------|------------|
| Test and Measurement Index | 1.7x       | 1.1x       |
| Anritsu                    | 0.7x       | 1.0x       |
| EXFO                       | 1.1x       | 0.9x       |
| Gigamon                    | 5.7x       | 3.6x       |
| Ixia                       | 2.1x       | 2.2x       |
| Spirent                    | 0.9x       | 0.8x       |
| Viavi                      | 1.6x       | 1.3x       |

#### **Company EBITDA Multiples**

|                            | 11/30/2016 | 11/30/2015 |
|----------------------------|------------|------------|
| Test and Measurement Index | 14.0x      | 11.7x      |
| Anritsu                    | 7.7x       | 7.5x       |
| EXFO                       | 12.5x      | 15.9x      |
| Gigamon                    | 51.6x      | 55.5x      |
| Ixia                       | 12.8x      | 14.7x      |
| Spirent                    | 5.9x       | 5.0x       |
| Viavi                      | 14.1x      | 24.3x      |

Source: Capital IQ

# FOCUS Telecom Technology and Services Team

#### **Richard H. Pierce**



Managing Director and Telecom Technology and Services Team Leader, Washington, DC rich.pierce@focusbankers.com 202-470-1983 Rich Pierce has more than ten years

of investment banking experience advising middle market clients on a variety of mergers and acquisitions and capital raising transactions. Dur-

ing that time, Mr. Pierce's primary emphasis has been on serving clients in the telecommunications industry including providers of network related hardware and software products, wireless, and wireline telecommunications service providers and network engineering and construction companies.

### John T. Bradshaw



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John Bradshaw has over 30 years experience in sales, marketing, manufacturing, finance, and systems engineering with corporations specializing in technology-driven business products and services. Mr. Bradshaw has been a successful

senior executive and manager in both large and small organizations, and has spent the last 15 years working with entrepreneurial companies. Mr. Bradshaw has particular expertise in enterprise communications and contact center related technology.

#### **David Freeland**



#### Principal, San Francisco, California david.freeland@focusbankers.com 978-505-1837

David Freeland, a FOCUS Principal, has more than fifteen years of experience providing investment banking and management consulting services to a variety of corporate clients, ranging from the Fortune 500 to start-up businesses. He has been an

investment banker since 2003, advising clients on mergers and acquisitions and capital raising transactions. Mr. Freeland has broad experience in the telecom and technology industry and has significant experience with data center companies.

#### Eric M. Oganesoff



#### Managing Director, Washington, DC eric.oganesoff@focusbankers.com 202-470-1969

Eric Oganesoff has conducted over forty M&A, debt, and capital raise transactions with an aggregate value of over \$300 million and has served as the CEO or President of several companies. Mr. Oganesoff has over twenty years of senior executive level

experience in leading businesses ranging from wireless solutions, software, and RFID services to manufacturing, industrial products, energy, and environmental products and government contracting.

# About FOCUS Investment Banking LLC

FOCUS Investment Banking LLC provides a range of middle market investment banking services with an emphasis on mergers, acquisitions, divestitures and corporate finance. FOCUS is a national firm serving clients from offices in major cities across the United States. FOCUS specializes in business units with transactions or revenues in the \$5-300 million range, serving entrepreneurs, corporate owners and various types of investors across a broad range of industries, throughout the U.S. and worldwide. FOCUS bankers are seasoned operating and financial executives with extensive transaction experience. Securities transactions conducted by FOCUS Securities LLC, an affiliated company, registered Broker/Dealer and member FINRA/SIPC. For more information on FOCUS, visit www.focusbankers.com.

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