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EPOCH DIRECT

Research

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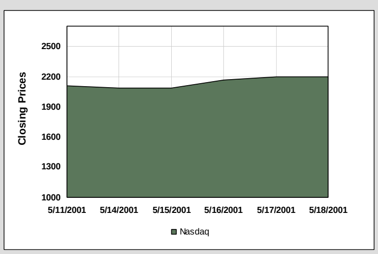
Epoch Indices for the Week

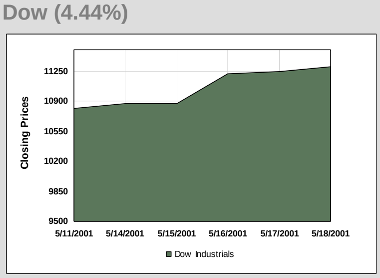
Broadband & IP Svcs:	2.93%
Comm Equipment:	3.38%
Internet:	5.50%
Software:	1.30%

Market Statistics (5-Day)

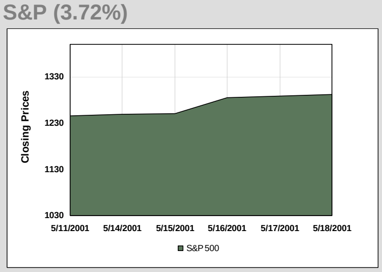
Nasdaq (4.34%)

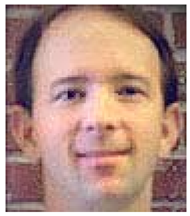


Dow (4.44%)



S&P (3.72%)





Changing of the Guard: A Look at the Converged Networks Industry

By Richard Shannon, Associate Analyst

Network convergence will fundamentally change the communications equipment industry, enabling rapid and dramatic shifts in market share. Convergence has been bandied about the industry for many years. As with many grandiose ideas (think of 3G wireless or all-optical switching), it has taken much longer than expected to find mass-market acceptance. However, we think that over the next twelve to twenty-four months, a flurry of activity on the vendor and carrier fronts will signal the changing of the guard.

What Does Convergence Mean?

Convergence has different meanings for different people, so a definition is in order. We define a convergent network as one that can transport all types of communications traffic together -- whether voice, data, or video -- over a single network infrastructure. While this may seem like a simple idea, the underlying complexities are tremendous. A converged network must manage traffic that can be steady or bursty (voice versus data), high-bandwidth or low-bandwidth (video versus voice), and delay-sensitive or delay-insensitive (voice or video versus data). These complexities have spurred most major carriers to use multiple overlay networks (in some cases, up to seven), each for its own specific traffic type. However, cost and other issues, which we discuss below, make the maintenance of separate networks an unscalable model.

Why Are Networks Converging?

We see a number of forces pushing carriers to consider new architectures and products that will enable converged networks.

- **Data Is Clogging the Voice Network:** Huge data-transport needs are forcing voice carriers to upgrade network capacity -- an investment on which they receive little return.
- **Data Traffic Is Growing Quickly:** Data traffic is growing much faster than voice, forcing carriers to examine their architectures.
- **Data Networking Equipment Is Cheaper:** Data networking equipment is much cheaper than voice equipment on a per-port basis, and its price is declining much faster.
- **Too Many Networks:** Most large carriers operate a number of separate, purpose-built networks (as many as seven). Each network requires different equipment and additional staff with different skill sets to maintain it. Converging networks can help to reduce capital expenditures and operational costs.

[more]

What Are the Obstacles to Convergence?

As with all gee-whiz ideas, the devil is in the details. Convergence has taken time because networks have not overcome the following obstacles:

- **Quality of Service:** Quality and reliability are necessities; without them, carriers won't even touch a new idea. Vendors must prove quality beyond any doubt before carriers will deploy a new network. The world expects 99.999% reliability for their voice services; anything else is unacceptable.
- **Legal/Regulatory:** Services such as Emergency 911 must be implemented.
- **Back-office Support:** If carriers can't manage and bill for the service, they won't touch it.
- **Inertia:** Most local carriers have little competition, so they can invest at their own will. Predicting when substantive investment will occur is difficult.
- **Long Sales Cycles:** To achieve quality, reliability, and back-office support, carriers subject their vendors to sales cycles that are measured in years. Emerging vendors can expect longer cycles until they prove themselves.

Why Are Converged Networks an Exciting Investment Opportunity?

The converged-network space is one of the most exciting investment opportunities to emerge in communications. Converged networks will make current networks obsolete; today's networks will be eventually replaced. In the U.S. alone, the book value of the telecommunications infrastructure is estimated at $335 billion, according to the FCC. Worldwide, it is closer to $600 billion. Synergy Research Group has estimated that the converged networking market will grow from $876 million in 2000 to $12.4 billion in 2005, representing a compound annual growth rate of 70%. We urge investors to look beyond this market research to the bigger picture. The cost to fully migrate to a converged network is well beyond $12.4 billion, and we think the market opportunity will be palpable well beyond 2005.

Who Are the Competitors?

The competitive landscape can be segmented into three groups: 1) incumbent suppliers, 2) established pure plays (companies with revenues for a few quarters), and 3) emerging pure plays (vendors still largely in test phase). The primary incumbent providers are, of course, Lucent and Nortel. They compete on two levels: both vendors have next-generation platforms that they are actively selling in the market, although with limited results. As a consequence, both vendors appear to be "freezing" the market by offering deep discounts on their legacy equipment.

In the established pure-play category, we include vendors like Sonus Networks, Clarent, Coppercom, Unisphere, and Convergent Networks. Sonus has had considerable success with large carriers in the U.S., while Clarent has succeeded mainly with smaller providers in international markets. Coppercom and Convergent have sold mainly to smaller providers in the U.S, while Unisphere has signed customers in many countries.

In the emerging category, we include companies such as Santera, General Bandwidth, Telica, Zhone, Oresis, Integral Access, Sylantro, VocalData, and Syndeo, among others. Of particular note are Zhone, which is extremely well-capitalized and has a top-rate management team, and Integral Access, which recently signed a contract with Time Warner Telecom.

How to Invest in This Space?

Obviously, the landscape for investing in the converged network theme is currently limited to only two pure plays. However, we see a number of opportunities for public companies in the next year or so. Thus, we suggest investors watch the following details:

- **Strong Customer Base:** We see continuing consolidation in the carrier segment, so vendors need to sell to major carriers that have financial staying power.
- **Full Product Line:** Leading vendors will have a full product line or tight partnerships with other vendors. Carriers are asking vendors to interoperate, causing a flurry of acquisitions over the past year. Vendors that have strong point products but no partnerships will not survive.
- **Migration Path to Converged Local Access:** Most of the value in the network will be at the local access point. Carriers that control the local access point have customer control and offer the value-added services. While converged local access is still a few years away, vendors must have a well-defined migration path to compete in this field today.
- **Watch What the Local Exchange Carriers Are Doing:** While choosing a vendor to invest in is important, choosing a time to invest is at least as important. With little competition to spur them, the incumbents will decide to invest in this equipment almost at their leisure; timing is therefore critical. We suggest investors monitor the large carriers for early signs of market acceleration.

Companies mentioned: Clarent (Nasdaq: CLRN, $10.00), Lucent (NYSE: LU, $9.95), Nortel (NYSE: NT, $14.45), Sonus Networks (Nasdaq: SONS, $29.95)

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Top 10 Stocks Bought*

Redback Networks (RBAK)	11.21%
Tut Systems (TUTS)	10.85%
Aether Systems (AETH)	10.37%
Mircomuse (MUSE)	9.01%
Juniper Networks (JNPR)	8.74%
Digital Island (ISLD)	8.59%
WebMethods (WEBM)	7.92%
Niku (NIKU)	6.77%
Rhythms NetConn. (RTHM)	6.45%
PurchasePro.com (PPRO)	6.34%

Top 10 Stocks Sold*

i3 Mobile (IIIM)	-3.79%
Digital Lightwave (DIGL)	-2.41%
Broadbase Software (BBSW)	-1.59%
Bookham Tech (BKHM)	-1.46%
EBay (EBAY)	-0.95%
Citrix Systems (CTXS)	-0.78%
Novell (NOVL)	-0.77%
FreeMarkets (FMKT)	-0.70%
Finisar (FNSR[3])	-0.69%
Vignette (VIGN)	-0.65% %

*Notes

Percent change from the prior week in the number of technology-related shares held by customers of our brokerage partners.

This Past Week at Epoch

5/14/01 **Palm: The Downward Spiral**

5/14/01 **Corvis: Binge and Purge**

5/14/01 **Cable & Wireless Reels In Digital Island**

5/14/01 **Fixed Wireless Is Not Dead, Just Hibernating**

5/15/01 **Sycamore CE Systems Has Sycamore Found Bottom?**

5/15/01 **360networks Does a 180**

5/16/01 **VCNT: Step in the Right Direction**

5/17/01 **Ciena: Smooth Sailing in Rough Seas**

5/17/01 **Vicinity Wireless Vicinity 3Q: A Fixer-upper**

5/17/01 **The Bottom Falls Out on Palm**

Heard on the Desk

Compiled by the Epoch Partners Equity Capital Markets Team

Retail Investors Not Sure Where to Put Their Money

Retail investors seem a bit confused lately. During the week ending May 11, the Nasdaq fell four days in a row, finishing down 3.8%. Though the market had a bad week, retail investors did little selling and a lot of buying.

The good news is that retail investors have given the communications equipment sector a break from the pounding they have inflicted over the last few weeks. But this week our investors seemed baffled at what to buy and sell. Trading activity was spread out among B2B, communications equipment, communications services, software, and wireless stocks.

On the top 10 list of stocks bought by retail investors, three are three-peats (i.e., are making their third appearance on the list). WebMethods (Nasdaq: WEBM: $24.82), Niku (Nasdaq: NIKU, $1.26), and PurchasePro.com (Nasdaq: PPRO, $2.54) have been consistent favorites among individual investors. Eight of the 10 stocks represented value buys, ending the week in negative territory. News of restructuring plans at Tut Systems (Nasdaq: TUTS, $1.87) and short falls in gross margin at Aether Systems (Nasdaq: AETH, $13.73) bruised both stocks -- which were down 36.6% and 26.3%, respectively – presenting "buy on dips" opportunities. Retail investors demonstrated that they are willing to hang in there and support companies when times are tough.

Company Highlight: Ciena (CIEN)

Company Description

Ciena sells systems that transport and direct information over fiber optic networks. Its optical hardware and management systems allow service providers to expand the capacity and flexibility of their networks for the emerging dominance of data traffic.

Investment Thesis

Ciena may be the strongest vendor in the optical systems sector. Bucking the recent slowdown in the industry, it boasts solid growth, high-profile customers, insightful management, and a pure product line unencumbered by legacy equipment. Its optical transport and switching solution is one of the most comprehensive and includes leading products for the burgeoning optical switching and metro markets. Macroeconomic weakness and a valuation contraction in the sector limit near-term upside. However, Ciena has what it takes to make long-term investors smile.

Key Points from Ciena's Earnings Release This Week

- Ciena handily beat our 2Q01 earnings and revenue estimates. The company continues to impress us despite telecom industry concerns. However, even this optical bellwether is not immune to a deteriorating carrier-spending environment.

- Gross margin slightly improved, but price pressure and the new K2 product should adversely affect gross margin in coming quarters. We are concerned that inventory turns fell as finished goods inventory bloated, however DSOs fell signaling improved collections despite "payment flexibility" demanded of Ciena competitors.

- Customer concentration (see the Epoch Partners Vendor Matrix) was high as two carriers accounted for 52% of revenue. This remains one of our primary concerns. However, strong acceptance of the CoreDirector optical switch will continue to allow Ciena to diversify its customer-base.

- Fundamentally, Ciena continues to impress and remains the strongest pure-play vendor of optical systems. However, as we cautioned in our March 27 note, it will be difficult for Ciena to continue on the warpath in a prolonged downturn. Thus, we are trimming our estimates.

- Recommendation: Although our long-term view of Ciena's business remains optimistic, we would take advantage of the stock's premium valuation to take some money off the table. At these levels, the risk exceeds the potential reward in today's macro environment. With CIEN's current 2001 revenue multiple of 9.3x and P/E ratio of 59.1x, we recommend that investors sell into strength. Long-term investors should look to accumulate shares opportunistically below $46.

- **Read our full commentary on Ciena's quarterly earnings release**

- **Read our full company report on Ciena**

Companies mentioned: Ciena (Nasdaq: CIEN, $57.35)

NOTE(S):

1. EPOCH SECURITIES, INC. MAINTAINS A MARKET IN THE SHARES OF THE COMPANY.

2. THE ANALYST(S) INVOLVED IN THE PREPARATION OF THIS REPORT HAS AN INVESTMENT POSITION IN THE SUBJECT SECURITY.

3. EPOCH SECURITIES, INC. HAS BEEN AN UNDERWRITING MANAGER OR CO-MANAGER OF THE COMPANY IN THE LAST THREE YEARS.

4. AMERITRADE, A MINORITY SHAREHOLDER OF EPOCH PARTNERS, HAS BEEN AN UNDERWRITING MANAGER OR CO-MANAGER OF THE COMPANY IN THE LAST THREE YEARS.