Setting a Course to Convergence: The Incumbents’ Wireline Strategies

EXECUTIVE SUMMARY

ABSTRACT:

While the telecommunications industry as a whole is still in turmoil, the overall direction in which it is now headed has become clear: Tomorrow’s telecommunications networks will be multiservice networks – networks that switch legacy and emerging services across a converged IP/MPLS layer, running over a high-capacity optical infrastructure.

In unique accord, all six of the West’s leading incumbent equipment providers agree that the future belongs to converged multiservice networks. More importantly, the majority of service providers have bought into the concept. Most of the 50 service providers interviewed for this report are now fleshing out their strategies for implementing such networks and reorganizing themselves internally to reap the twin benefits that converged networks promise to deliver: lower operating costs and easier service deployment.

But that’s where the consensus ends. The industry may agree on where it needs to go – but there is complete confusion over how best to get there, or which of the incumbent equipment suppliers is in the best position to help service providers realize their goals.

To find answers to these questions, Heavy Reading has spent the last three months producing this 120-page report, Setting a Course to Convergence: The Incumbents’ Wireline Strategies.

Over the past few years, the bursting of the telecom bubble has wreaked havoc amongst equipment suppliers. All of the big players have had to make agonizing decisions concerning which technologies they’re going to continue developing and which ones they’re going to scrap or put into hibernation. Now that the dust is clearing from the battlefield, it’s become clear that some vendors have improved their overall positions while others have suffered permanent damage.

Getting a read on who’s ahead isn’t easy, but it’s absolutely crucial for every sector of the telecom industry to do so:

- **Carriers** need to put their suppliers through a health check, reevaluate their residual strengths and weaknesses, and examine their own visions of the future of telecom to make sure they are in alignment with the technological strategies of manufacturers.
- **Incumbent equipment manufacturers** need to see how their strategies measure up against their opponents, so they can address their own problems and also exploit their competitors’ deficiencies.
- **Startup equipment manufacturers** need to know what the incumbents are planning, and where the gaps are in their product lines, in order to position themselves for acquisition and/or partnership.
- **Communications chip manufacturers** need to know what their biggest customers are working on in order to anticipate future demand for their wares.
- **Investors** need insight into which of the big equipment vendors will emerge to dominate the multiservice market.

Major findings of Setting a Course to Convergence include:
• IP/MPLS is the DNA of tomorrow’s telecom. Incumbents won’t succeed unless they build or buy the technology – router partnerships and co-developments are a red herring.

• Transport and packet networks will remain distinct layers for the coming decade. Vendors with product strategies that assume complete convergence will find sales to large carriers impossible.

• Carriers are focused on the “cost of change” – the impact on existing revenues of shifting voice circuits and leased lines onto a converged IP/MPLS backbone.

• Vendors are split over ATM’s role in the migration to converged networks. Nortel is ATM’s biggest proponent – a strategy that looks increasingly prescient.

• Lucent is shedding its own convergence products in favor of re-inventing itself as a service organization. It will fail.

• Packet voice transport is happening slowly, posing a challenge for Siemens, which has staked its future on carriers moving to Class 5 replacement now.

• Cisco defined the convergence market and currently leads it – but issues with ATM, OAM, reliability, and VOIP mean its position is not unassailable.

• Success for incumbent vendors is in the timing, not the technology. Developing products that support convergence in sync with carriers’ needs is the biggest challenge facing vendors today.

• Alcatel’s once outstanding broadband vision is in urgent need of repair. It now lacks, not only a broadband remote access server, but also a core routing platform.

• The telecom industry will recover more quickly if one or two incumbents are superceded by either second-tier players in the US or incumbents in Asia.

• Carriers are committed to MPLS but think vendors are dragging their feet on remedying its deficiencies. Marconi’s restructured finances and “hollow core” network architecture will count for nothing if it cannot re-establish its reputation with new customers.

METHODOLOGY:

Setting a Course to Convergence tackles its subject head-on through exclusive in-depth interviews with the men who are shaping the future of telecommunications: the CTOs at the West’s six biggest incumbent equipment manufacturers:

• Niel Ransom, CTO of Alcatel
• Mike Volpi, senior VP and general manager of Cisco’s Routing Technology Group
• Bill O’Shea, CTO and executive VP of corporate strategy and marketing for Lucent and president of Bell Labs
• John Cunliffe, VP of network strategy for Marconi
• Greg Mumford, CTO of Nortel
• Perry Kamel, senior VP of the NGN Business Unit of Siemens ICN

This is the first time that all six of these industry mavens have been interviewed using consistent questions to produce comparable data about their companies’ disparate product strategies. The result is a unique and comprehensive reference document containing both quantitative and qualitative analysis.

EXCERPT:

Niel Ransom, CTO of Alcatel:

IP PBXs are taking off in a big way. On the enterprise side you really can see it happening. And ultimately what happens in the enterprise will drive new carrier services.

Network elements themselves will take on a lot of the responsibility that the operations systems used to do. They’ll talk to the other nodes to diagnose problems.

Mike Volpi, Senior VP and General Manager of Cisco’s Routing Technology Group:

A lot of carriers are starting to talk to us about CPE, can we offer a voice service from the customer premises, or a managed security service from the customer premises.

I actually think there’s a drive towards differentiation of billing methodology, rather than a drive towards uniformity of it.

What we’re really looking at is not a general increase in spending, but a reallocation of capital dollars that used to be going to more traditional telco equipment, like TDM and circuit equipment, to packet equipment.
Bill O’Shea, CTO and Executive VP of Corporate Strategy and Marketing for Lucent and President of Bell Labs:

We’ll continue to see the inevitable march to the all-optical network that we started to see a few years ago… We’ve lost a little faith in that, but I think it’s coming nonetheless – and it’s the most fundamental transformation in the network.

In the IP world today we just don’t have the kind of predictability we need, to deal with some of the real-time services like voice and video. So somehow we’re going to have to find protocol solutions that bring the best of both of those worlds. In the near term, it’s clearly an MPLS direction. In the longer term, I think we’ll need even more sophisticated protocol capabilities as we go forward.

John Cunliffe, VP of Network Strategy for Marconi:

We also see a major cost saving opportunity if the operator is able to delay their network by skipping the metro router stage and backhauling more of the traffic into the core. You can make a great saving here, because you can take a lot of expensive equipment out of the metro area, staffing costs are lower, and your routing is simpler because you’ve only got one layer of hierarchy and not two or more.

Router vendors would have you believe that IP is basically the same as MPLS (the routing code is the same, right?). Nothing could be further from reality.

Many operators still have stovepipe architectures in their network, which gives them massive scope for simplification [and cost reductions]. But just because the scope for saving is massive doesn’t mean that it can happen quickly. The sheer scale of the networks tends to mean that changes can’t happen overnight.

Greg Mumford, CTO of Nortel:

Historically we’ve been focusing on the idea of protocols for interconnection. Now we also need to be looking at what do we need in order to connect the user directly to the service. A lot of today’s protocols don’t handle seamless service delivery.

I see everyone wanting to move to an implementation that has lower cost than ATM. Also, in network structures you can’t rip stuff out and start again. Evolution and migration is key. The target is IP/MPLS. But there’s a lot of value tied up in existing ATM deployment, and we’re investing in making sure it stays a valuable deployment.

Perry Kamel, Senior VP of the NGN Business Unit of Siemens ICN:

If you look at the debates around some of the regulatory aspects in the market over the last year, a lot of people were fighting hard for broadband relief. But broadband without the supporting and enabling technologies that provide for a converged service delivery in a QOS-oriented environment does not solve the underlying economic consequences.

What we’re seeing with our customers is an increase in traffic volatility of the order of 300%. In other words, the patterns that govern the flow of the traffic are changing roughly three times or more frequently than they used to... As a general guide, what we’ve observed is that over a two to three year period the increased volatility can cut into the available capacity to the tune of 20 to 30%.

I think searching for the elusive killer app can be a frustrating, and not very rewarding experience.

VENDOR RANKINGS:

Setting a Course to Convergence provides a detailed explanation and evaluation of the incumbents’ business and technology positions based on the data provided during the interviews as well as other publicly available information.

It pulls no punches, ranking the companies using six critical metrics:

- Breadth of Vision
- External Expression of Vision
- Internal Expression of Vision
- Ability to Execute
- Ability to Change Direction
- Financial Stability

Company results are presented numerically, using a newly developed graphical market research tool called the Heavy Reading Hexagon™, which summarizes complex issues in a simple format.
The *Heavy Reading* Hexagon allows a quantitative, graphical representation of a multi-faceted concept such as “strategy.” Each metric is scored on a scale of 0-5, and the point plotted on that axis of the hexagon. From the resulting shape inside the hexagon, the reader can instantly see that, the bigger the shape, the better the strategy for that vendor.

In addition, if the shape is biased towards the right of the hexagon, the vendor may be better at marketing than they are at delivering on their claims – vice versa, if the shape is biased towards the left. For example:

The *Heavy Reading* Hexagon™ is a key feature of the report. It makes it possible to measure something as broad in scope and vague in its objectives as a company strategy. The hexagon represents complex product, strategic, and visionary issues in an easy-to-understand and easy-to-compare format. It empowers business and network managers to make down-to-earth decisions based on much more than marketing messages.
Feedback from 50 Service Providers:

Setting a Course to Convergence also includes input from fifty of the world’s leading service providers. It uses feedback from the key decision makers within these organizations as a sounding board for evaluating the strategies of the big vendors. The carrier executives provide critical insights into what they need service providers to deliver, which migration strategies hold the most promise, and what convergence concerns still occupy them. Above all, they provide a dose of reality with which to temper the “marketectures” being put forward by the incumbents.

Excerpt:

Carriers are overwhelmingly behind the move to convergence, but they still express concerns over timing, vendor product implementations, standards, and the impact on their existing revenues and company structure.

- In converged network architecture, there’ll clearly be a merging of organizations – the transmission guys with the router guys. Which of the organizations do you choose as the lead? Transmission makes money; routers don’t – at least today. And every premium revenue service we can deploy over a router is probably cannibalizing business from our private lines and Frame Relay. – VP Operations, North American Service Provider

- There is no way that we’ll be removing our Sonet equipment. Private-line services represent a vital revenue stream [from customers] that demand Sonet-like levels of resilience and protection. IP/MPLS may be able to demonstrate this kind of resilience, but until it has a real carrier track record we’ll build it as a discrete layer over the Sonet network. – Network Architect, North American Service Provider

- Our studies have indicated that TDM-based services won’t grow so fast that they put stress on our existing Sonet/SDH equipment. But new services like residential broadband and business VPNs are growing fast – too fast for TDM architectures to keep up. Our biggest concern is whether to deploy a migration architecture, or to simply build out modern, converged networks in parallel to our existing TDM equipment. – CTO, Non-Incumbent European Service Provider

- How much IP functionality can be integrated into Sonet/SDH equipment? It seems to me that this stuff was all designed in a different generation, and the processors and RAM on there won’t have the horsepower to run the [IP and MPLS] protocols. – Research Scientist, North American RBOC

- While MPLS is an excellent idea in theory, there are many fundamental aspects of the technology that are quite simply broken. And these deficiencies mean that an MPLS network will be extremely difficult to maintain. It’s going to take some big network failures to make the vendor lobby in the IETF understand the need for these changes. – Network Architect, Global Service Provider
• In terms of packet QOS it seems to us that vendors are asking us to force-fit services onto whatever subset of QOS their box supports. We don’t really know if this approach will scale in a real carrier network. – Design Consultant, Pan-European Service Provider

• Everybody talks about video over DSL. That’s what it was invented for in the first place. And I don’t know of any service provider who ran their trial for longer than a year before giving up on it. Now everyone wants to bang their head against that same wall all over again. – CTO, Latin American Service Provider

KEY FINDINGS:

Timing Is Everything

A key finding of Setting a Course to Convergence is that success for incumbent vendors is in the timing, not the technology. As Niel Ransom, Alcatel’s CTO, points out, it’s relatively easy to predict what technologies will be used in telecom networks. The fundamental challenge facing vendors today is predicting when those technologies will reach the point that they’ll be widely deployed by carriers – and developing a product line roadmap that introduces convergence solutions to meet that demand as it starts to peak.

Heavy Reading calls this the Goldilocks Factor.

• Too little: Alcatel failed to develop its own edge router to address the converged backbone future, so it had to scramble and buy TiMetra.

• Too much: Just about everybody got the timing wrong on all-optical switches. While they will be needed one day, everybody got carried away in the bubble years and peaked way, way too early. Siemens risks doing the same thing with packet voice: It’s charging ahead with a strategy that assumes carriers will move quite quickly to Class 5 replacement, a gamble that might pay off eventually – but only if its parent company is prepared to continue funding the losses it is sustaining today in order to be around when the market comes to fruition.

• Just right: Alcatel happened to hit the timing right with DSL, more by luck than judgment, and, as a result, it now dominates a market that has turned into a monster. Nortel did the same thing with 10-gig technology (more through judgment than luck). Cisco has a lock on the core router market, for historical reasons, and this gives it a huge springboard on MPLS.

While practically everyone believes in converged backbones, including carriers, the timing of when this actually happens is going to be crucial factor in deciding the success or failure of different vendor strategies. Heavy Reading’s belief is that the transformation is going to take a long time, not because of lingering doubts about technology maturity but because carriers face huge challenges in dealing with all of the other aspects of selling and supporting services, and getting paid for them.

In the case of converged backbones, the changes are absolutely fundamental. Carriers are going to have to undergo huge organizational and cultural changes to move away from their current modus operandi to one that is in line with the whole multiservice approach. Many of the big incumbent carriers have set out on the road towards this goal, but they’ve got a long way to go.

Shared Visions of Infrastructure Convergence

Another key report finding is that the visions expressed by the six incumbents are very similar. When convergence was first seen as a trend, each company’s positioning was very different; today the marketing stories themselves have converged.

For customers, the fact that vendors are marching to the same beat is potentially very good news, as it offers them the opportunity to build multi-vendor, best-in-class networks without compromising on architectural issues. However, the fact that all the companies are, at a marketing level, singing the same song also makes it hard to differentiate among their positions. (It also presents a huge marketing challenge for vendors; differentiating converged network solutions against their competition is a mammoth task.)

Heavy Reading has developed a graphical tool that makes it easier for service providers to analyze vendors’ strategies.

As discussed, vendors and carriers share a common goal – to build converged, multiservice, packet-based networks. Heavy Reading calls this network design the Converged Network Infrastructure (CNI), and our “CNI Model” makes it simple to break through vendors’ marketing positions to see what they really deliver.

The CNI vision is based on four key features, illustrated in the model below.

1. The network is built over a discrete Optical Transport Network (OTN) layer.
2. Switching is performed over a converged IP/MPLS core.
3. A service-specific adaptation function performs edge classification and switching.
4. An appropriate access technology delivers service traffic to the end user.

Wrapped around the outside of this CNI are enterprise and residential users of the network applications and services, some of which we’ve detailed on the model.

The Converged Network Infrastructure Model

![Diagram of the Converged Network Infrastructure Model]

Source: Heavy Reading

These four features of the CNI are given “outwards” from the network core. Using this model, it's possible to identify which products vendors have in place and, conversely, what’s missing. (The model also shows how vendors are exploiting sales in one area of the CNI to achieve follow on sales in other areas).

**EXCERPT:**

![Excerpt from the Converged Network Infrastructure Model]

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The combination of positioning vendors’ products within this CNI model and analyzing more general strengths and weaknesses using the disciplines inherent in the Heavy Reading Hexagons provides unique insights into company strategies. But Heavy Reading hasn’t stopped there. We’ve compared these strategies with a view of carrier requirements coming from our 50 interviews to formulate views on which vendors have the best (and worst) prospects.

For example, it’s abundantly clear that most incumbent carriers won’t risk shifting existing money-making services such as voice circuits and leased lines onto a converged IP/MPLS backbone any time soon. It’s too much of a risk. The vast majority of them will run these services directly over their optical transport networks for the time being.

Nortel is in a good position to benefit from this, because it has a strong set of optical transport products. It’s also leveraging its strength in this field in a commendable way by targeting new markets for optical transport gear, such as SAN interconnect.

We would characterize Nortel’s strategy as pragmatic and not very forward thinking, which is no bad thing. An example of this is its continuing development of ATM products. It makes a lot of sense, because carriers have a huge installed base of ATM and still have some reservations about MPLS, notably over limited operations, administration, and maintenance (OAM) features.

On the MPLS side of things, Nortel’s internal developments (its efforts to make its own core router) haven’t kept pace with its vision. It’s tough to see what the traditional telecom equipment vendors can do about the dominance of Cisco and Juniper in IP. We don’t think the co-development partnerships they’ve formed will lead to anything; such deals rarely do.

Nortel’s strategy of talking the talk on MPLS while walking the walk on ATM contrasts sharply with that of Lucent, which has totally lost the plot. It halted ATM developments after acquiring Ascend for $20 billion to gain a market leadership position – a decision that beggars belief.

It appears that Lucent is pursuing a strategy of exiting manufacturing and reinventing itself as a systems integrator, in the way many mainframe manufacturers did 20 years ago. This is a strategy of last resort. IBM achieved this by re-inventing itself in the mid to late 90s, but it was building on a proud heritage of offering high-quality service and support. Lucent is not. It placed fourth in this category out of the six companies covered in last month’s Heavy Reading 2003 Market Perception Survey. (Only 9 percent of the service provider employees that took the survey recognized Lucent as a leader in service and support.)

Another problem is that this strategy freezes Lucent’s installed base. Also, Lucent’s track record on IP developments is hardly going to inspire confidence among prospective customers. Would any major carrier ask Lucent to design its IP backbone? The danger for Lucent is that it will be relegated to low-level, low-margin systems integration tasks – and that won’t sustain it over the long term.

**CONCLUSION:**

This report does something that Heavy Reading knows will be controversial – to provide a simple ranking of the major incumbent service provider suppliers’ strategies. The fact that some players may disagree with the findings does not invalidate them. The opposite, if anything, is probably true.

*Setting a Course to Convergence: The Incumbents’ Wireline Strategies* is published in PDF format.