Sonet/SDH-to-Ethernet Migration Strategies

EXECUTIVE SUMMARY

The staying power of Sonet/SDH technology has been proven for nearly two decades. In 2005, however, the near universal embrace of IP-based services and Ethernet access is beginning to reveal the ultimate limitations of Sonet/SDH, and many carriers are devising strategies to extend their network packetization plans all the way into the transport layer. Though this clearly does not spell the end of Sonet/SDH as we know it, it has already forced equipment suppliers to rethink their transport product lines in light of new carrier requirements.

Without question the most important and far-reaching undertaking of any telecom operator today is the steady, inexorable migration to a packetized network. This migration can range from transitioning select services (voice and video) to packet, to migrating entire network infrastructures away from the TDM world (DS3s, OC-ns) to a packet world, based largely on IP as a unifying service delivery protocol and Ethernet as a universal data-link layer and physical transport layer.

Sonet/SDH-to-Ethernet Migration Strategies focuses on the latter by analyzing how, when, and why operators will migrate their transport network infrastructure away from pure TDM and Sonet/SDH to a design optimized around IP and Ethernet. This process is well underway in many operator networks today, and it is already proving its value – namely in the creation of a “flatter” network with overall reduced costs of equipment and maintenance, permitting more rapid, flexible service introduction, provisioning, and control.

The key questions now facing network operators include the following:

- Is Ethernet-based transport capable of matching the levels of protection and performance management offered by Sonet/SDH?
- Are Ethernet transport networking standards in place to support multivendor interoperability and low-priced solutions?
- Are there more attractive solutions than Ethernet for a packetized transport network?
- What are the key triggers and thresholds to cost-justify moving to an IP-over-optical network architecture?
- Where is it most appropriate to start this migration – in the core, at the edge, or in the access network?

This report investigates each of these questions in detail, with some answers provided from an exclusive worldwide survey of 135 network operator employees conducted by Heavy Reading regarding Sonet/SDH-to-Ethernet migration strategies. The report is also based on direct interviews conducted with leading network operators and telecom equipment manufacturers.
Network operators analyzed in this report:

- AT&T Inc., formerly SBC Communications (NYSE: T)
- BCE Inc. (NYSE/Toronto: BCE)
- Broadwing Corp. (Nasdaq: BWNG)
- BT Group plc (NYSE: BT)
- Colt Telecom Group plc (Nasdaq/London: COLT)
- Deutsche Telekom AG (NYSE: DT), and its subsidiary T-Systems International GmbH
- Level 3 Communications Inc. (Nasdaq: LVLT)
- MCI Inc. (Nasdaq: MCIP)
- Telstra Corp. Ltd. (NYSE/Sydney: TLS)
- Verizon Communications Inc. (NYSE: VZ)
- WilTel Communications Group Inc., a subsidiary of Leucadia National (NYSE: LUK)

Equipment vendors analyzed in this report:

- Alcatel (NYSE: ALA; Paris: CGE)
- Ciena Corp. (Nasdaq: CIEN)
- Cisco Systems Inc. (Nasdaq: CSCO)
- Corrigent Systems Inc., a subsidiary of Orckit Communications (Nasdaq/Tel Aviv: ORCT)
- ECI Telecom Ltd. (Nasdaq: ECIL)
- Fujitsu Ltd. (Tokyo: 6702; London: FUJ)
- Lucent Technologies Inc. (NYSE: LU)
- Marconi Corp. plc (Nasdaq: MRCIY; London: MONI)
- Nortel Networks Ltd. (NYSE/Toronto: NT)
- Siemens AG (NYSE: SI; Frankfurt: SIE)
- Tellabs Inc. (Nasdaq: TLAB; Frankfurt: BTLA)

The transition to Ethernet optical transport is already underway in the metro, and is showing signs of progress in the access and core networks as well. When asked the major drivers of metro optical network deployments, operators polled by Heavy Reading point unequivocally to triple-play services and business Ethernet services. Beyond these, operators listed enterprise connectivity and broadband access, both of which rely heavily on Ethernet as a means of connectivity or backhaul. In sum, every service identified is one that drives the use of Ethernet as a transport layer; those services that rely primarily on TDM transport – Frame Relay, ATM, and traditional leased lines – are all flat or in decline, unable to meet the price-performance metrics of Ethernet.

Excerpt 1: Major Drivers of Metro Optical Networks Worldwide
Report Scope and Structure
Sonet/SDH-to-Ethernet Migration Strategies is structured as follows:

Section I is an introduction to the report, with complete report key findings.

Section II begins with an assessment of the impact of Ethernet on operator networks, including a technology overview and presenting results from Heavy Reading's carrier survey to illustrate how Ethernet is moving from a services infrastructure to a transport infrastructure.

Section III provides details on the response from Sonet/SDH vendors', which have evolved their platforms to include migration to Ethernet functionality and a higher degree of Layer 2 switching and aggregation.

Section IV looks at how and when network operators will migrate their transport networks to Ethernet, and the obstacles they face along the way.

Section V summarizes our network operator interviews.

Section VI provides assessments of the vendors offering solutions that migrate transport networks from Sonet/SDH to Ethernet.

The report is essential reading for a wide range of industry participants, including the following:

- **Telecom equipment suppliers**: How is the transition from Sonet/SDH to Ethernet taking place, and how will this shift affect your product lines? How much revenue life is left in Sonet/SDH products? What features of Ethernet transport still need improvement in the eyes of network operators? In which parts of the network will the transition to Ethernet take place most aggressively? What's the likely timeframe for this critical transition?

- **Telecom service providers**: How are vendor Ethernet products evolving to meet your needs? Which suppliers are taking an approach that fits best with your company's transition strategy? Are your current suppliers the best option, or are there other choices that are better aligned with your plan?

- **Investors**: Which equipment makers are in the best position to thrive during this critical transition stage? Which companies are emerging as the early winners in this sector, and which ones are likely to struggle for market share?

Sonet/SDH-to-Ethernet Migration Strategies is published in PDF format.