



Practical Ethernet Solutions for Mobile Core Networks

Leveraging Ethernet to Optimize Network Performance

Ethernet Core Advantages

Unpredictable traffic growth and the rapid proliferation of core network elements make it increasingly difficult to scale mobile networks cost effectively. Deploying Ethernet technologies overcomes these challenges by enabling mobile operators to move varying amounts of capacity to wherever demand dictates – quickly, and at a low cost per bit.

The SN 16000 Intelligent Optical Switch does that and more, with support for versatile Ethernet transport over existing infrastructures that merges Sycamore's advanced Ethernet Packet Intelligence (intelligent policing, aggregation, and packet-to-circuit mapping) with SONET/SDH reliability. The SN 16000:

- Improves capacity utilization with Ethernet flow mapping
- Recovers unused bandwidth available in non-contiguous paths
- Increases scalability by dynamically resizing Ethernet links

A range of standards-based protection schemes (Mesh, 1+1, Ring) allows mobile operators to meet specific service requirements. Sycamore's fully integrated optical switching platforms deliver new operational efficiencies, reliable performance, multiservice configuration flexibility, and pay-as-you-grow Ethernet implementations.

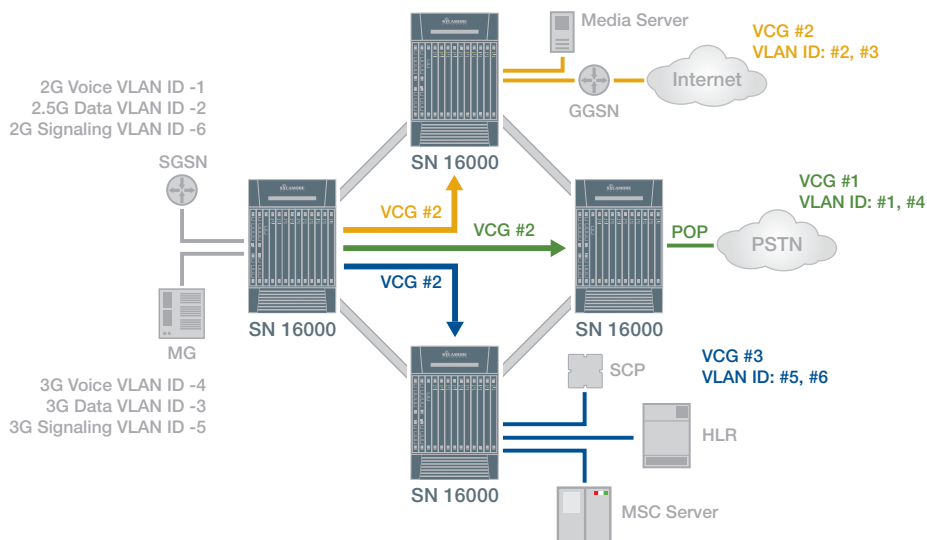


Figure 1: Ethernet Flow Mapping Improves Capacity Utilization

Features and Benefits

- Improves Bandwidth Utilization in Mobile Core
- Increases Scalability while Reducing Cost per Bit
- Enhances Network and Service Resiliency
- Adapts Quickly to Unpredictable Traffic Demands
- Simplifies Management of VCGs and Constituent Circuits

Optimize Capacity Utilization

Mobile network traffic has also transformed from primarily voice to high-speed data and multimedia content, with application and media servers distributed throughout the mobile core – only adding to the difficulty of optimizing core network performance. Ethernet flow-based mapping on the SN 16000 directs high-speed data traffic across transport facilities efficiently and automatically, using Layer 2/ Layer 3 tags (e.g., Ethernet VLAN ID, MPLS labels) to map the flows to specific Virtual Concatenation Groups (VCGs). The utilization ratio of each mobile backbone link improves significantly when dynamically established links are used to carry traffic between SGSNs/MSCs and GGSNs, media servers, HLRs and SCPs (Figure 1).

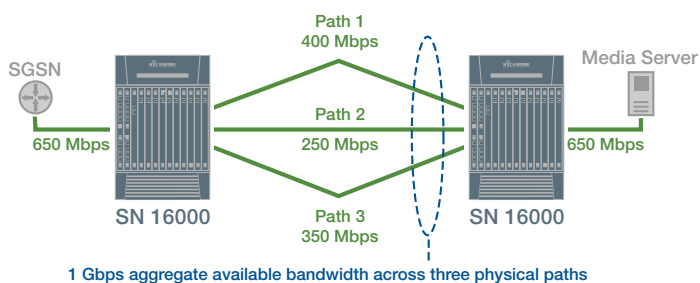


Figure 2: SN 16000 Recognizes and Recovers Unused Bandwidth Across Multiple Paths

Mapping Ethernet flows to right-sized optical transport simplifies operations and reduces OpEx. SN 16000 flow mapping also brings new flexibility to mobile core network planning by removing topology constraints. Operators can locate network elements wherever service demands dictate. Ethernet Packet Intelligence tightly integrates the optical and packet layers, bringing the proven benefits of intelligent optical networking (e.g., robust OAM, rapid provisioning and restoration) to Ethernet transport.

Recover Bandwidth and Improve Resiliency

Recovering unused capacity in mobile core networks typically entails frequent reconfigurations fraught with operational and maintenance challenges. However, the SN 16000's ability to recognize and capture under-utilized capacity in non-contiguous transport paths allows a mobile operator to optimize bandwidth utilization and meet the growing demand for capacity without extensive regrooming or reconfiguration.

For example, in Figure 2, the SN 16000 provisions a GigE circuit by recognizing and recovering unused bandwidth across multiple paths. 650 Mbps represents the current need, with 350 Mbps allocated for future growth.

Ethernet deployments can also prove challenging to operations management because a single service is often routed over multiple paths, and the failure of one constituent circuit within a VCG can impact the service. The SN 16000 enhances the manageability and reliability of all aspects of Ethernet service delivery, including VCGs and constituent circuits. In the event of a partial failure of one path within a VCG, the SN 16000 immediately reconfigures the connection using remaining, viable VCG constituents. Ethernet Packet Intelligence automatically removes a failing VCG member and adds it again upon recovery, to enhance the stability of the Ethernet connection and improve overall resiliency of the mobile core network.

Enhance Scalability

Sudden, unpredictable bandwidth demand occurs frequently in social networking and video applications. The transport layer must scale cleanly and rapidly in order for mobile operators to capitalize on unanticipated surges driven by end-user whims. With several media servers hosting diverse media applications across the mobile core, the ability to scale network capacity quickly and on short notice becomes a powerful planning advantage. The SN 16000 delivers unmatched scalability, enabling operators to add new service interfaces or make incremental changes via software – with point-and-click simplicity.

By resizing the capacity of an Ethernet link, the SN 16000 also empowers dynamic bandwidth allocation between SGSNs and media servers. Seamless agility further ensures that a mobile operator can realize revenues from a ramp-up in demand, while reducing mobile core network OpEx.

Ethernet Core Opportunities

Sycamore switching platforms recover unused bandwidth in the mobile core to meet growing traffic needs and optimize CapEx investments, while improving link utilization to reduce core OpEx. The SN 16000 can help mobile operators turn the challenge of meeting unanticipated growth in demand into a revenue generating opportunity by dynamically scaling core network capacity at a low cost per bit. Sycamore's advanced Ethernet Packet Intelligence enables reliable Ethernet transport in the mobile core and turns the backbone into a highly efficient and resilient packet network.

Sycamore Networks, Inc. • 220 Mill Road • Chelmsford, MA 01824-4122, USA • Phone: 978-250-2900 • Fax: 978-256-3434 • www.sycamorenet.com

Sycamore Networks, Inc. (NASDAQ: SCMR) is a leading provider of intelligent bandwidth management solutions for fixed line and mobile network operators worldwide. From multiservice access networks to the optical core, Sycamore products enable network operators to lower overall network costs, increase operational efficiencies, and rapidly deploy new revenue-generating services.

Sycamore assumes no responsibility for the accuracy of the information presented, which is subject to change without notice. Sycamore and Sycamore Networks are trademarks or registered trademarks of Sycamore Networks, Inc. in the United States and/or other countries. Copyright © 2009 Sycamore Networks, Inc. All Rights Reserved.

