



## SN 16000 Intelligent Optical Switching Platform

### Secure Your Transition to Dynamic Bandwidth and Net-Centric Operations

#### A Powerful Foundation

Integrating seamlessly with the voice and data technologies in today's government networks, the SN 16000 Intelligent Optical Switch supports diverse applications while setting new benchmarks for modularity and switching power. Consolidating multiple network functions (BB-DCS, ADM, DWDM, OXC) in one intelligent and highly scalable platform delivers high-density, multiservice (voice/data/IP) aggregation with maximum flexibility and efficiency.

Intelligent bandwidth management improves capacity utilization, simplifies operational procedures, and enhances network scalability. Ethernet Packet Intelligence – intelligent policing and packet-to-circuit mapping – builds on the efficiency and interoperability enabled by ITU-T standards (VCAT, LCAS, GFP) to achieve a new level of Ethernet services manageability. Together, modular architecture and intelligent bandwidth management create a more robust, resilient infrastructure that optimizes network and service performance while reducing costs and complexity. The SN 16000's advanced switching capabilities form the secure and reliable cornerstone for network-centric operations and services.

#### Modularity Ensures Flexibility

Modular chassis design makes it possible to precisely tailor the switch to the location – today and tomorrow. Matrix sizes from the single chassis SN 16000 SC (64 x 64, 160 Gbps) to the industry's largest SN 16000 MC-1024 (1024 x 1024, 2.56 Tbps) enable operators to scale networks simply, non-disruptively, and on a just-in-time basis to accommodate high-bandwidth, multiservice traffic growth. In any configuration, completely redundant hardware system components and interconnections deliver field-proven reliability.

Taking modularity a step further, the SN 16000's Universal Service Card (USC) incorporates interchangeable high-speed Ethernet, SONET/SDH, and OTN/G.709 interfaces and pluggable transport optics – on a single line card. The USC allows unprecedented network design flexibility, pay-as-you-grow deployments, and provides an extensible platform for feature enhancements. Industry-leading Ethernet port densities offer a compelling alternative to costly router interfaces for scaling IP/data networks. From chassis configuration to service interfaces and transport optics, unprecedented modularity contributes to unsurpassed port density, flexibility, and network availability.

#### Intelligence Enhances Manageability

Sycamore's industry-leading BroadLeaf® networking software and SILVX® network management system empower seamless, network-centric operations. BroadLeaf/SILVX synergies create an extremely robust optical layer to support data traffic (ATM, Frame Relay, Ethernet, IP, and private line) with system-wide manageability and scalability.

#### Features and Benefits

- Unmatched Capacity and In-Service Scalability
- Interchangeable SONET/SDH, Ethernet Interfaces
- Highly Modular, Pay-as-You-Grow Architecture
- RADIUS Authentication, Other Security Features
- Optical Mesh Resiliency, Field-Proven Reliability
- JITC-Certified Interoperability and Performance



When used in combination, the interoperability of Sycamore's edge-to-core portfolio of intelligent optical switching platforms (SN 16000, SN 9000, SN 3000) further enhances end-to-end manageability by ensuring seamless connectivity between remote agency or base locations and backbone networks.

The same distributed intelligence that supplies the agility to deliver high-speed services and recover rapidly from failure events also underpins the integrity of government applications. The SN 16000's rich set of security features, from RADIUS central authentication and audit logs to secure channels and strong encryption, help protect mission-critical communications and infrastructure assets.

Versatile, software-configurable (per-port) protection options, ranging from standards-based SONET/SDH schemes to dynamic mesh restoration, ensure high network availability

and survivability. Unique conduit identification features increase network-level resiliency by considering the physical location of the fiber when creating back-up paths. The SN 16000 automatically reroutes a failed link over a physically diverse path, to eliminate single points of failure.

Compliance with emerging control plane standards (IETF GMPLS, OIF UNI/NNI, ITU-T ASON) enhances the SN 16000's JITC-certified multi-layer, multi-vendor interoperability. Intelligent bandwidth management and Ethernet Packet Intelligence increase provisioning flexibility, improve network resiliency, and guarantee the most efficient use of network resources.

**For more information about our intelligent networking products and solutions, please contact your Sycamore Sales Representative.**

## SPECIFICATIONS HIGHLIGHTS

### System

- Fully redundant system hardware and software
- Fully non-blocking SONET/SDH grooming switch
- Grooming to STS-1/AU-3 granularity
- Matrix sizes from 64 x 64 (160 Gbps) to 1024 x 1024 (2.56 Tbps) – In-service hitless chassis upgrade from 320 Gbps to 2.56 Tbps
- Ethernet Private Line Services
- Ethernet Virtual Private Line Services
- Intelligent Ethernet policing and packet-to-circuit mapping

### Service Interfaces

- SONET/SDH (OC-3/STM-1, OC-12/STM-4, OC-48/STM-16, OC-192/STM-64)
- Gigabit Ethernet and 10 Gigabit Ethernet
- OTN OTU-2 with integrated tunable transponder

### USC Line Interface Modules and Pluggable Optics

- 4 x OC-48/STM-16 LIM with SFP optics (SR, IR, LR, DWDM)  
Per USC: 2 LIMs (8 ports total)
- 1 x OC-192/STM-64 LIM with XFP optics (SR, IR, LR, DWDM)  
Per USC: 2 LIMs (2 ports total)
- 10 x GigE LIM with SFP optics (SX, LX, ZX) - Per USC: 2 LIMs (20 ports total)
- 1 x 10 GigE LIM with XFP optics (SR, LR, ER) - Per USC: 2 LIMs (2 ports total)
- 1 x OTU-2 LIM with full C-band tunable wavelength and FEC/EFEC support

### Network Architecture and Protection Switching

- Linear, Ring, Mesh, and Hybrid
- Per port software configurable
- 1+1 Linear APS/MSP
- UPSR/SNCP
- 2- and 4-fiber BLSR/MS-SPRing
- 1+1 Path Protected
- Dynamic Mesh Restoration
- Gateway between SONET and SDH
- IP-based and OSI-based DCC interoperability

### Fault and Performance Management/Monitoring

- Local network element alarm indication
- Autonomous alarm forwarding
- Automatic laser shutdown
- Threshold crossing alerts
- Full suite of diagnostics: loopbacks, test access, on-demand, bridge and roll

### BroadLeaf® Networking Software

- ASON/GMPLS-compliant control plane software
- Standard OSPF-based routing and MPLS-based signaling
- Automatic topology discovery
- In-band/out-of-band control plane
- Manually defined or automated path/circuit route selection and provisioning
- Multi-vendor, multi-layer internetworking
- OIF UNI/E-NNI capable

### SILVX® Management Software

- Node management: SilvxSource®
- Network management: SilvxManager®
- Network design & planning tools: SILVX InSight®
- Northbound interfaces: TL1, TMF CORBA, XML, SNMP (alarms) SilvxOSS®
- Full TMN FCAPS functionality
- Network and capacity planning applications
- Layered services provisioning and management
- Real-time network and service views

### Regulatory and Standards Compliance

- ITU-T: G.957 Optical Interfaces (SDH), G.7041 Generic Framing Procedure (GFP), G.707 Virtual Concatenation (VCAT), G.7042 Link Capacity Adjustment Scheme (LCAS)
- IEEE 802.3
- Telcordia Technologies™ OSMINE processes (TIRKS, NMA)
- NEBS Level 3 (GR-63-CORE)
- Bellcore GR-1089-CORE
- EN 300 386 / EN 55024 / EN 55022
- CSA listed to UL/CSA 60950
- Worldwide Homologation

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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.

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