



# BroadLeaf Networking Software

## The ASON-Powered Intelligence Behind Leading Optical Networks

### Proven in Performance

BroadLeaf®, the advanced software integrated across Sycamore Networks SN 16000, SN 9000, and SN 3000 switching platforms, empowers fully automated, end-to-end networking, including automatic topology discovery, dynamic provisioning across multiple architectures, and flexible assignment of diverse protection options. Along with SILVX® network management software, BroadLeaf forms the agile, resilient optically switched infrastructure required for intelligent bandwidth management. This industry-leading software underpins simultaneous support for existing and emerging technologies and services, unmatched scalability and survivability, and multi-vendor, multi-layer interoperability – the advantages that distinguish Sycamore switches.

BroadLeaf was among the first control plane implementations to fit within the ITU-T ASON architecture for I-NNI signaling and routing, and Sycamore developed the first commercially available application of IETF GMPLS. Sycamore was also co-editor of the OIF UNI 1.0 specification and an early proponent of a unified (IP/Optical) control plane.

Today, the first IP standards-based optical control plane is the most robust optical switching software in the industry, augmented by continuous innovation and enhancement based on years of deployment experience in production networks. BroadLeaf proves its maturity and reliability every day in some of the world's largest, most innovative and respected networks, including Vodafone, KT, NTT, Telkom South Africa, and the US Department of Defense (DoD).

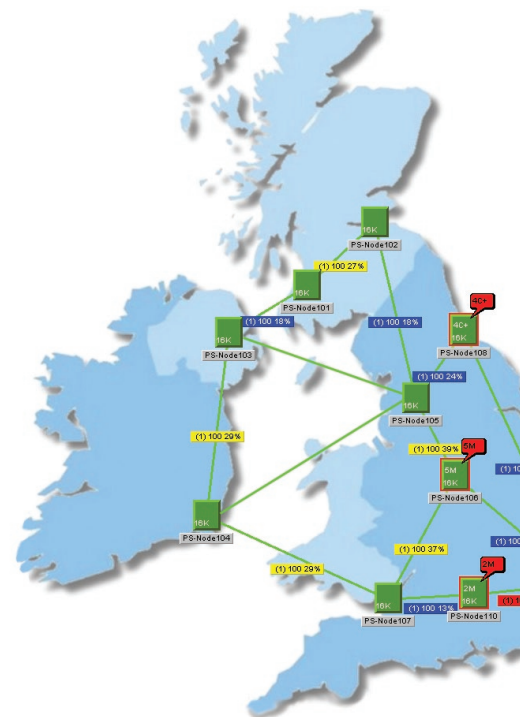
### Simplify Provisioning

All nodes in a BroadLeaf-empowered network communicate with each other, creating a network-wide database of real-time information (e.g., link and capacity status, routing tables and resources) that enables true point-and-click provisioning, routing, protection, restoration, and management of end-to-end circuit and packet services. BroadLeaf uses the Open Shortest Path First (OSPF) routing protocol for dynamic, constraint-based routing and automatic peer discovery, and a Multi-Protocol Label Switching (MPLS) based signaling protocol to identify connections through the network.

Automatically communicating circuit set-up information from node to node accelerates initial provisioning and re-routing. BroadLeaf further enhances OA&M with circuit health alarms, hitless reconfiguration of circuit and protection parameters, and integrated active circuit management (e.g., IPPM, Forced Reroute). Network operators establish an end-to-end circuit with a single provisioning request, by simply identifying the bandwidth, specific source and endpoints, and desired protection type.

### Features and Benefits

- The Premier Intelligent Optical Networking Software
- Fully Automated, End-to-End Network Functions
- Dynamic Service Provisioning, Simplified Operations
- Mesh Resiliency and Efficiency Proven in Tier 1 Networks
- Real-Time Network Data Improves Traffic Engineering
- Reliable Foundation for Intelligent Bandwidth Management



Provisioning can be fully automated, with the route determined by the network, or the operator can stipulate a defined route for automated set-up. Either way, BroadLeaf's unmatched topology, element, and capacity awareness shorten time-to-revenue and introduce operational efficiencies that reduce costs. Because signaling and routing information is based in each node and not constrained to the NMS, distributed intelligence also supports creation of optical VPNs, and link tunneling that extends dynamic networking capabilities across other vendors' networks.

### Ensure Survivability

Another aspect of intelligent optical switching flexibility – simultaneous support for rings and mesh – has its roots in BroadLeaf's per-port configurable Quality of Service and self-inventory, self-configuration, and self-healing capabilities. Sycamore switches support a full range of SONET/SDH ring protection, from APS/MSP to UPSR/SNCP and 2F/4F-BLSR/MS-SPRing. What's more, they interoperate with other vendors' ring protection, and allow interworking among SONET/SDH, optical mesh, and hybrid architectures. This simplifies operations and controls costs during network transition and optimizes bandwidth utilization by allowing full restoration of working traffic with no loss of ring capacity.

Mesh protection and restoration options include 1+1 Path Protection, Dynamic Source Reroute, and Unprotected. Optical mesh resiliency enables rapid recovery, even from multiple, simultaneous failures – as Sycamore switches have proven in Tier 1 carrier networks. BroadLeaf distributed intelligence underpins the survivability of vital infrastructure and services. Industry-leading ring and mesh restoration capabilities, which Sycamore strives to continuously improve, further ensure carrier-class performance.

### Underpin Dynamic Networking

BroadLeaf networking software enables efficient grooming and switching of circuit/packet services, dynamic service provisioning, and resilient mesh restoration in ways that support and augment ASON, GMPLS, and UNI/NNI standards for next-generation networks. Fully integrated across an edge-to-core portfolio of switching platforms, BroadLeaf and SILVX network management software rely on one another to synchronize and automate end-to-end network and service management; provide real-time information for traffic engineering and network modeling; and create OVPNs, network partitioning, and dynamic bandwidth services.

Together, they empower service providers to improve operational efficiencies and reduce costs, increase service differentiation, and guarantee service level agreements with confidence. Sycamore's unique approach to intelligent optical switching and bandwidth management forms the most flexible, reliable, scalable, and secure foundation for dynamic networks and services.

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

### SPECIFICATIONS HIGHLIGHTS

#### 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

#### 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

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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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