



# Intelligent Ethernet Transport for Multiservice Networks

## Connection-Oriented Ethernet Solutions Simplify Transition for Government Networks

### Achieving Net-Centric Operations

Government agencies and defense department bases are looking for more versatile and efficient Ethernet connectivity to handle explosive growth in communications traffic, including wireless data, centralized computing services, bursty traffic, and high-capacity video applications. Sycamore connection-oriented Ethernet solutions do that and more, smoothing the transition from circuit-based to packet-based services by leveraging existing infrastructure to create more dynamic and scalable networks. Intelligent Ethernet transport helps network operators address IP-centric service requirements and gradually evolve wireless and fixed line infrastructure; while maintaining support for reliable TDM and circuit traffic, reducing operational cost and complexity, and ensuring the availability of mission-critical networks.

### Connection-Oriented Ethernet Solutions

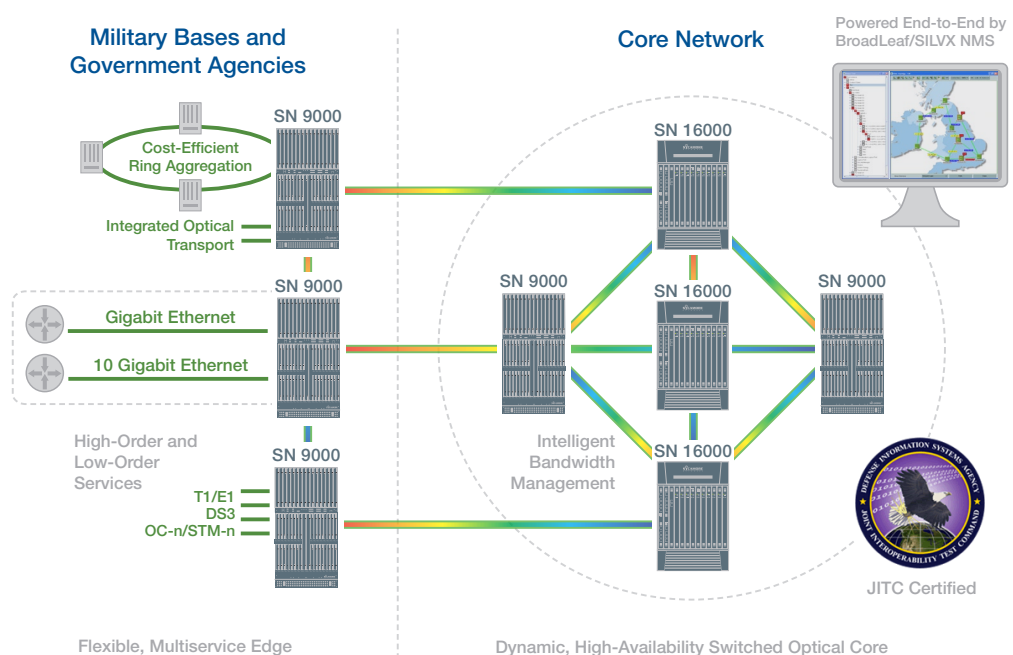
Sycamore multiservice switches combine flexible, multirate Ethernet connectivity and SONET/SDH reliability with the end-to-end provisioning simplicity empowered by our industry-leading BroadLeaf® optical control plane. The result is diverse, cost-efficient Ethernet aggregation and transport, leveraging intelligent, multirate interfaces from 10/100/1000 Mbps to 10 Gigabit Ethernet (GigE). These interfaces are independent of the SONET or SDH layer on which they ride, configurable in either environment, and extend from the multiservice edge to the high-capacity optical core. Standards-based packet-to-circuit mapping and highly efficient policing schemes allow prioritization of Ethernet traffic into appropriate VCAT groups (VCG).

Sycamore intelligence in the multiservice network ensures quality of service (QoS) for Ethernet connections across the underlying transmission systems. Support for ITU-T standards, including Generic Framing Procedure (GFP), Virtual Concatenation (VCAT), and Link Capacity Adjustment Scheme (LCAS), and all four industry-standard Metro Ethernet Forum (MEF) service classes, optimizes capacity utilization, alleviates chokepoints, and improves service resiliency.

Tightly integrating the optical and service layers brings the advantages of intelligent multiservice and optical switching (e.g., simplified end-to-end provisioning, mesh survivability, enhanced performance management) to connection-oriented Ethernet. And, like all Sycamore solutions, intelligent Ethernet transport interoperates smoothly with existing infrastructure, standards, and management systems – while forming a foundation for scalable bandwidth, flexible connectivity, and net-centric operations.

### Features and Benefits

- Optimize Circuit/Packet Convergence
- Improve Bandwidth Agility and Utilization
- Empower Multiservice Manageability
- Enhance Network and Service Resiliency
- Increase Scalability and Reduce Costs



**Figure 1: Multiservice Flexibility**  
 Sycamore intelligent multiservice switches efficiently aggregate and groom multirate Ethernet, packet, and circuit traffic. Adding hierarchical protection and mesh survivability to multiservice flexibility forms a versatile, packet-optimized solution that enhances bandwidth utilization while simplifying provisioning and operations.

**Exceptional Control and Manageability**

Sycamore Ethernet solutions enable seamless circuit/packet convergence in rapidly evolving government and defense networks. They support next-generation data applications and traditional voice services across the network, from remote bases and metro/regional processing sites to the optical core. Efficiently aggregating and grooming multirate Ethernet, packet, and circuit traffic – with hierarchical protection and mesh restoration added to multiservice flexibility – forms a versatile, reliable end-to-end solution that enhances bandwidth utilization while simplifying provisioning and operations.

Ease of connectivity and manageability are critical to non-disruptively expanding Ethernet and IP communications across traditional, TDM-based networks. SILVX® management software enables secure support and simple configuration for diverse, resilient Ethernet connections. In combination with SILVX, VCAT and LCAS allow hitless, on-demand bandwidth adjustments for time-of-day and scheduled bandwidth services. SILVX also simplifies VCG and constituent circuit management with user-friendly displays of Ethernet and Layer 2 performance statistics.

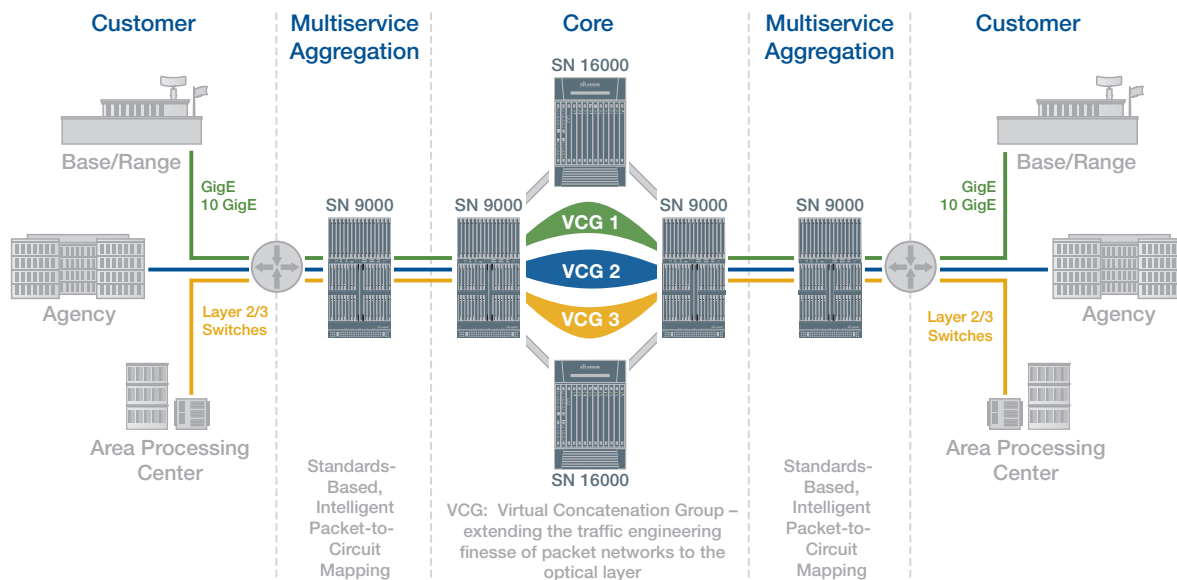
SILVX and BroadLeaf software – shared across Sycamore multiservice switching platforms – deliver enhanced provisioning, flow control, protection mechanisms, and performance management features. For network operators, this simplifies the configuration and management of network protection schemes and guarantees information assurance for mission-critical applications.

**Multiservice Flexibility**

Intelligent Ethernet transport provides a secure, resilient and dedicated path for multiservice traffic and makes it possible to map high-priority traffic to specific VCGs. Precisely mapping Ethernet flows to right-sized optical transport, with a choice of protection options, ensures optimal use of network capacity, improves network resiliency, and allows service customization to accommodate varying bandwidth and QoS requirements. High-availability Ethernet solutions support diverse applications, from connecting defense bases and processing centers to a central facility, to disaster recovery – any situation requiring distributed, protected services.

Most installed network elements use service-specific interface cards, which offer limited scalability and increase operational cost and complexity. Trying to address a broad spectrum of services with these cards leads to stacked chassis and escalating power and space challenges.

In contrast, Sycamore multirate Ethernet solutions include any-service-on-any-port configuration flexibility. The ability to modify services without physically changing end port connections alleviates sparing issues and stranded ports; streamlines new connections and bandwidth upgrades; and makes it easier to optimize node configurations when service mixes continually change – all of which substantially reduce operating costs.



**Figure 2: Connection-Oriented Ethernet Solutions**

Intelligent Ethernet transport efficiently maps Ethernet flows to right-sized optical transport, with a choice of protection options, and supports diverse applications, from connecting defense bases and processing centers to a central facility, to disaster recovery – any situation requiring distributed, protected services.

**Unmatched Scalability**

Sycamore high-capacity, multiservice switches provide non-disruptive, in-service scalability up to an unprecedented 2.5 Tbps capacity at the network core with the SN 16000 Intelligent Optical Switch, and ranging from 80 to 320 Gbps through innovative capacity licensing on the SN 9000 Intelligent Multiservice Switch. Fully non-blocking, service-agnostic switch fabrics and modular architectures support a flexible mix of multirate Ethernet and SONET/SDH interfaces, and pluggable WDM optics. Network operators plug in only what they need, when and where they need it – often via software.

Sycamore Ethernet solutions also offer an affordable, scalable alternative to costly packet-over-SONET/SDH (PoS) or best-effort IP-over-DWDM approaches. Packet-to-circuit mapping on high-capacity multiservice switching platforms is a more efficient way to provision, fill, and optimize MPLS trunks. Aggregating multiple Ethernet streams onto a single 10 Gigabit Ethernet interface for hand-off to a router maximizes utilization of expensive router ports and DWDM capacity, and minimizes the need for complex Layer 3 protection schemes.

**Simplified Evolution and Expansion**

Government networks can now scale gracefully, cost-effectively, and on a just-in-time basis to accommodate high-bandwidth, multiservice traffic growth. Sycamore SN 9000 and SN 16000 switches with intelligent Ethernet transport help network operators:

- Meet rapidly changing application requirements
- Enable cost-effective convergence strategies
- Simplify operations to reduce the total cost of ownership

Resilient support for a mix of traditional and emerging voice, data, and video services turns the challenge of meeting fluid, unpredictable capacity demands into a reliable and highly manageable multiservice network for mission-critical communications.

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

