

## New, High-Speed ATM LANE/MPOA Modules for the Catalyst 5000 Family of Switches

DEPLOYABLE ACROSS THE CATALYST® 5000 FAMILY OF SWITCHES, ASYNCHRONOUS TRANSFER MODE (ATM) OC-12 AND OC-3 DUAL-PHY UPLINK MODULES FROM CISCO SYSTEMS DELIVER HIGH-SPEED LAYER 2 AND LAYER 3 CONNECTIVITY ACROSS ATM CAMPUS NETWORKS BY USING ATM FORUM STANDARD LAN EMULATION (LANE) AND MULTIPROTOCOL OVER ATM (MPOA).

These modules support two interfaces (dual-PHY: one active, one standby) with built in quality-of-service (QoS) support and a range of media options—both single-mode and multimode fiber.

### Accelerating Today's ATM Networks

Each OC-12 module delivers wire-speed (622 Mbps) LANE v1.0 connectivity and services and has the necessary hardware scalability for MPOA client, LUNI v2.0, QoS, and traffic shaping. The new OC-3 modules also deliver wire-speed (155 Mbps) LANE v1.0 as well as dedicated hardware for MPOA client, LUNI v2.0, QoS, and traffic shaping. With these new Catalyst ATM dual-PHY uplink modules Cisco extends the Catalyst 5000 family leading-edge performance for today's ATM LANE networks and sets the stage for future technologies.

### MPOA

As an integral part of the Cisco Layer 3 switching strategy, MPOA provides a standards-based Layer 3 switching solution for ATM networks. An MPOA network comprises the following: an MPOA server (MPS) and an MPOA client (MPC). Routers, such as the Cisco 7000 series or the Catalyst 5000 route switch module, support the MPS function that supplies all the Layer 3 forwarding information used by MPCs. The Catalyst OC-12 and OC-3 LANE/MPOA modules support MPC through dedicated onboard hardware. With a hardware implementation of MPOA, Cisco provides unmatched performance for MPOA and delivers distributed, high-speed Layer 3 switching through the ATM backbone.

### QoS

With the convergence of mission-critical business and multimedia applications on the common intranet, there is an increasing need for QoS and support for multicast-intensive applications. A new set of intranet services is required to ensure the reliability and availability of these applications. Future Cisco IOS® software upgrades enable a mapping between IP precedence, Resource Reservation Protocol (RSVP), 802.1p, and ATM QoS. Used in the end-to-end Cisco QoS strategy, customers can deploy the Catalyst 5000 OC-12 or OC-3 dual-PHY uplink modules and prioritize traffic into different ATM service classes, such as weighted unspecified bit rate (wUBR) virtual circuits.

### Fault-Tolerant ATM Connectivity

The ATM OC-12 or OC-3 dual-PHY uplink modules deliver fault tolerance for critical network applications using two unique features “dual-homed” ATM and LANE server redundancy.

#### “Dual-Homed” ATM

“Dual-homed” ATM, or dual-PHY ATM, allows network administrators to deploy redundant connections from one uplink port. Similar to Fiber Distributed Data Interface (FDDI) dual homing, the ATM dual-PHY uplink modules provide link redundancy by duplicating the data link with a primary and secondary interface. If connectivity is lost on the primary interface, because of either link failure or loss of Integrated Local Management Interface (ILMI) communication, data connectivity automatically switches over to the redundant secondary interface.

### LANE Server Redundancy

Each of the new Catalyst ATM dual-PHY uplink modules deliver redundant LANE services using Cisco LANE Simple Server Redundancy Protocol (SSRP). LANE SSRP provides redundancy for all of the server components in LANE—the LANE configuration server (LECS), the LANE server (LES), and the broadcast and unknown server (BUS). Cisco SSRP allows the enterprise-wide deployment of ATM by removing LANE servers as a single point of failure.

### Scalable, Distributed LANE Servers

Unique among ATM edge devices, the Catalyst 5000 enhances ATM LANE network performance by delivering support for the entire range of LANE v1.0 servers. By using this feature, network administrators can easily distribute LANE services across each Catalyst ATM dual-PHY uplink module. For example, this feature allows scalable distribution of bandwidth-intensive LANE BUS services for multimedia applications. Operating as a standalone LANE v1.0 BUS, each Catalyst OC-12 dual-PHY uplink module can forward more than 400,000 pps. The new Catalyst OC-3 dual-PHY uplink module can also act as a standalone LANE v1.0 BUS with wire-speed performance for 64-byte packets.

### Flexible Architecture

The LANE protocols and signaling run on onboard processors, permitting software upgrades to meet evolving ATM standards.

### VLAN/ATM Integration

By using the industry-leading Cisco IOS software, the Catalyst OC-12 or OC-3 dual-PHY uplink module extends virtual LAN (VLAN) capabilities throughout the network, spanning switched LANs and ATM-based services such as ATM servers by mapping VLANS to ATM LANE LANs (ELANs).

## ATM OC-12 Uplink Module Specifications

### Physical Specifications

- Occupies one slot in the Catalyst 5000 platform
- Dimensions (H x W x D): 1.2 x 14.4 x 16 in. (3 x 35.6 x 40.6 cm)
- Weight: 3 lbs or 0.65 kg

### Environmental Conditions

- Operating temperature: 32 to 104 F (0 to 40 C)
- Storage temperature: -40 to 167 F (-40 to 75 C)
- Relative humidity: 10% to 90%, noncondensing

### Safety Certifications

- UL1950
- CSA 950
- EN60950
- CE Marking
- TUV GS
- IEC 950
- AS/NZS 3260

### Electromagnetic Emissions Certifications

- FCC Part 15 (CFR 47) Class A
- VCCI Class B
- EN55022 Class B
- CISPR 22 Class B
- CE Marking
- AS/NZS 3548 Class B

### Processors

- ATM control processor: Motorola 68EC030
- SAR: two 100-MHz processors (transmit/receive)
- Packet processor: two 150-MHz MIPS 4650 (transmit/receive)

### Frame-to-Cell Conversion

- AAL5
- 4096 virtual circuits
- 255 concurrent reassembly

### ATM Standards

- RFC 1483 LLC SNAP bridging encapsulation (PVC)
- PVC traffic shaping (GCRA) (future software upgrade)
- ATM forum LANE v1.0 LEC, LECS, LES, BUS
- ATM forum LUNI v2.0 LEC
- ATM forum MPOA v1.0 multiprotocol client (MPC)
- UNI 3.0/3.1, Q.2931 signaling protocols
- ILMI

#### Network Management

- Cisco Discovery Protocol
- Definitions of Managed Objects for Bridges (RFC 1493)
- Evolution of Interfaces Group of MIB-II (RFC 1573)
- SNMP MIB II (RFC 1213)
- AToM MIB (RFC 1695)
- LEC MIB (ATM Forum LANE V1.0)
- Cisco Workgroup Stack MIB
- Cisco VLAN Trunk Protocol (VTP) MIB
- Cisco LECS, LES/BUS MIB
- ILMI MIB

#### Indicators

- Module status: green (operational)/red (faulty)
- Link status: green (operational)
- Port active status: green (operational)
- Signal: status: green (operational)
- RX: green flashing (receive activity)
- TX: green flashing (transmit activity)

#### Interfaces

- Multimode fiber (SC), single-mode (SC)
- Diagnostic port: RJ-45
- Optical specifications

#### Multimode Fiber (OC-12)

- Transmitter output power: -19 to -14 dBm
- Receiver sensitivity: -26 to -14 dBm
- Wavelength: 1300 nm
- Optical source: LED
- Maximum span: 500m

#### Single-Mode Fiber (OC-12)

- Transmitter output power: -15 to -8 dBm
- Receiver sensitivity: -28 to -8 dBm
- Wavelength: 1300 nm
- Optical source: Laser
- Maximum span: 15 km (intermediate reach)

#### Multimode Fiber (OC-3)

- Transmitter output power: -19 to -14 dBm
- Receiver sensitivity: -32.5 to -14 dBm
- Wavelength: 1270 to 1380 nm
- Optical source: LED
- Maximum span: 2 km

#### Single-Mode fiber (OC-3)

- Transmitter output power: -14 to -8 dBm
- Receiver sensitivity: -32.5 to -8 dBm
- Wavelength: 1261 to 1360 nm
- Optical source: laser
- Maximum span: 10 km



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