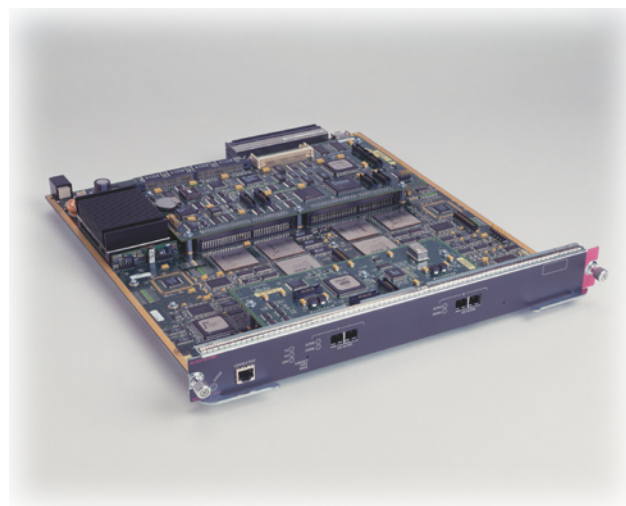


## Catalyst 6000 Family New High-Speed ATM LANE/MPOA Modules

DEPLOYABLE ACROSS THE CATALYST® 6000 FAMILY OF SWITCHES, NEW ASYNCHRONOUS TRANSFER MODE (ATM) OC-12 DUAL-PHY UPLINK MODULES FROM CISCO SYSTEMS DELIVER HIGH-SPEED LAYER 2 AND LAYER 3 CONNECTIVITY ACROSS ATM NETWORKS.

Figure 1 Catalyst 6000 Family OC-12 LANE/MPOA Module



Support for both ATM Forum standard LAN Emulation (LANE) and Multiprotocol over ATM (MPOA) enable the Catalyst 6000 Family of switches to connect to ATM backbones, providing scalable, intelligent switching with value-added high availability services. Service Provider and Enterprise customers alike can take advantage of support for RFC 1483 Permanent Virtual Circuits (PVC's) with traffic shaping to extend transparent LAN services across wide area ATM networks. In addition, future support for end-to-end Quality of Service (QoS) will enable enterprise voice solutions and services to seamlessly coexist between Ethernet and ATM backbones.

These modules each support a dual-PHY interface (one active, one standby) with built in hardware support for wirespeed forwarding and quality of service (QoS) over a range of media options – both singlemode and multimode fiber.

### Accelerating Today's ATM Networks

Each Catalyst 6000 Family OC-12 module delivers wire-speed (622 Mbps) LANE v1.0 connectivity and high availability services while providing scalable hardware support for MPOA client, LUNI v2.0, QoS, and PVC traffic shaping. These new ATM dual-PHY uplink modules extend the Catalyst 6000 Family's leading-edge performance for today's ATM LANE and MPOA networks, and set the stage for future advanced ATM technologies.

### Scalable, Distributed LANE Services

The Catalyst 6000 Family enhances ATM LANE network performance by delivering support for the entire range of LANE v1.0 servers. By using these features, 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 6000 Family OC-12 dual-PHY uplink module can forward more than 400,000 pps.

### MPOA

As an integral part of the Cisco intelligent 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 7500 and Cisco 7200 support the MPS function that supplies all of the Layer 3 forwarding information used by MPCs. The Catalyst 6000 Family OC-12 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 throughout the ATM backbone.

### Fault-Tolerant ATM Connectivity

The Catalyst 6000 Family ATM OC-12 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 the 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.

### VLAN/ATM Integration

By using the industry-leading Cisco IOS® software, the Catalyst 6000 Family OC-12 dual-PHY uplink module extends virtual LAN (VLAN) capabilities throughout the network, spanning switched LANs and native ATM-based services by mapping VLANS to ATM LANE Emulated LANs (ELANs) or RFC 1483-compliant Permanent Virtual Circuits (PVCs). Each LANE/MPOA module provides hardware-based traffic shaping of output flows on a per-PVC basis.

### Flexible Architecture

The LANE protocols and signaling run on onboard processors, permitting software upgrades to meet evolving ATM and QoS standards. For instance, Cisco will add future support for fast LANE server recovery, complementing the current support for redundant LANE servers via SSRP, and enhanced QoS mechanisms to enable end-to-end support between Ethernet and ATM networks.

### Fast LANE Server Recovery

ATM networks will soon be able to achieve extremely high levels of continuous availability through adoption of Cisco’s latest improvement to SSRP, called Fast SSRP (FSSRP). This new technology will allow LANE Clients (LECs) to connect to multiple LES/BUS pairs simultaneously, so that in the event of a failure of one or more of these LANE services, the LEC remains connected and able to forward traffic. Thus, not only can LANE services be distributed throughout an enterprise for elimination of single points of failure, but LANE clients can also remain fully operational during the switchover between LANE servers.

### End-to-End 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 are required to ensure the reliability and availability of these applications. These advanced services enable seamless deployment of mission-critical data, voice and video traffic over mixed Ethernet and ATM networks. Future Cisco IOS software upgrades will enable a mapping between IP Precedence and 802.1p to ATM QoS. Customers can deploy the Catalyst 6000 Family OC-12 dual-PHY uplink modules today, and soon will be able to prioritize traffic into different ATM service classes such as weighted unspecified bit rate (UBRw) virtual circuits as part of the Cisco end-to-end QoS strategy.

### ATM OC-12 Uplink Ordering Information

Part Number	Description
WS-X6101-OC12-MMF	OC-12 ATM LANE/MPOA Uplink for the Catalyst 6000 Family switches, multimode fiber, SC
WS-X6101-OC12-SMF	OC-12 ATM LANE/MPOA Uplink for the Catalyst 6000 Family switches, singlemode fiber, SC

### ATM OC-12 Uplink Module Specifications

#### Physical Specifications

- Occupies one slot in the Catalyst 6000 Family switch
- 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

- UL 1950 [3rd Ed.]
- CSA C22.2 No. 950-95
- EN60950 [1992 including Amendments 1-4 and 11]
- EN60825-1
- TS001 [1997]
- CE Marking
- IEC 950 [2nd Ed. including Amendments 1-4]
- IEC825-1
- AS/NZS3260 [1993 including Amendments 1-4]
- 21CFR1040

#### Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- ICES-003 Class A
- VCCI Class B
- EN55022 Class B
- CISPR22 Class B
- CE Marking
- AS/NZS3548 Class B

#### Telecommunications

- ITU-T G.610
- ITU-T G.703
- ITU-T G.707
- ITU-T G.783 Sections 9-10
- ITU-T G.784
- ITU-T G.803
- ITU-T G.813
- ITU-T G.825
- ITU-T G.826
- ITU-T G.841
- ITU-T G.957 Table 3
- ITU-T G.958
- ITU-T I.361
- ITU-T I.363
- ITU I.432
- ITU-T Q.2110
- ITU-T Q.2130
- ITU-T Q.2140
- ITU-T Q.2931
- ITU-T O.151

- ITU-T O.171
- ETSI ETS 300 417-1-1
- TAS SC BISDN (1998)
- ACA TS 026 (1997)
- BAPT /TC/139 (Draft 1e)
- CSELT

#### Processors

- ATM control processor: 100 MHz MIPS
- SAR: two 100-MHz processors (transmit/receive)
- Packet processor: two 200 MHz MIPS (transmit/receive)
- Frame-to-Cell Conversion
- ATM Adaptation Layer 5 (AAL5)
- 4096 virtual circuits
- 1850 concurrent reassembly

#### ATM Standards

- RFC 1483 LLC SNAP bridging encapsulation (PVC)
- PVC traffic shaping (GCRA)
- 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
- UNI 4.0 (future software upgrade)
- 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)
- RX: green flashing (receive activity)
- TX: green flashing (transmit activity)
- Port active status: green (operational – per-port basis)
- Signal: status: green (operational – per-port basis)

## Interfaces

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

## Optical Specifications

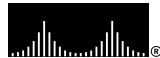
### Multimode Fiber (OC-12)

- Transmitter output power: -20 to -14 dBm average EOL coupled into 62.5/125 um, 0.275 NA graded-index multimode fiber
- Receiver sensitivity: -26 to -14 dBm average with Bit Error Ratio 1 x 10 E-10 max
- Wavelength: 1300 nm
- Optical source: LED
- Maximum span: 500m

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

- Transmitter output power: -15 to -8 dBm average
- Receiver sensitivity: -28 to -8 dBm with Bit Error Ratio 1 x 10 E-10 max
- Wavelength: 1300 nm
- Optical source: Class I Laser
- Maximum span: 15 km (intermediate reach) S-4.1

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