Catalyst 5000 ATM Dual PHY LAN Emulation Module

The Cisco Systems industry-standard Catalyst® 5000 Asynchronous Transfer Mode (ATM) LAN Emulation (LANE) dual physical sublayer (PHY) module integrates both Token Ring and Ethernet LAN traffic across an ATM campus network.

Standards-Based Token Ring and Ethernet LAN Connections to ATM Backbone Services

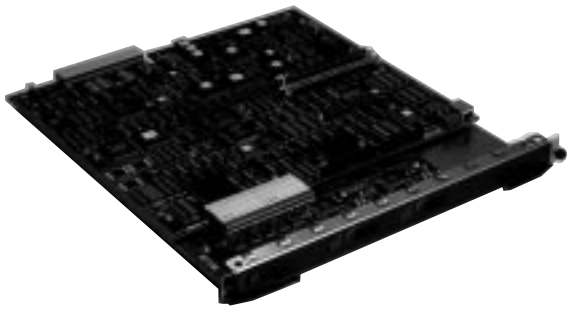
The Cisco Systems industry-standard Catalyst® 5000 Asynchronous Transfer Mode (ATM) LAN Emulation (LANE) dual physical sublayer (PHY) module integrates both Token Ring and Ethernet LAN traffic across an ATM campus network.

The module supports both types of LANs, with an ATM Forum-compliant LAN Emulation Client (LEC) implementation as well as ATM Forum-compliant LANE services—LAN Emulation Configuration Server (LECS), LAN Emulation Server (LES), and Broadcast and Unknown Server (BUS).

Now Catalyst 5000 customers can connect their Ethernet and Token Ring attached end stations over the same ATM LANE backbone to legacy LAN attached servers or to high-speed servers attached directly to the ATM infrastructure. The ATM module supports transparent bridging for Ethernet as well as all the Token Ring bridging modes—source-route switching (SRS), source-route transparent bridging (SRT), and source-route bridging (SRB)—across the ATM fabric. A maximum of three ATM LANE modules in a Catalyst 5000 platform and a maximum of seven ATM modules in a Catalyst 5500 platform provide redundant, fault-tolerant connections. The LANE module sets new standards for low-cost integration of switched 4-, 16-, and 100-Mbps Token Ring as well as switched Ethernet and Fast Ethernet over ATM.

The module supports two (one primary, one secondary) 155-Mbps OC-3c interfaces with a wide range of media options—single-mode fiber, multimode fiber, and unshielded twisted-pair (UTP, Category 5).

The Catalyst 5000 ATM dual PHY LAN Emulation module provides high-performance, fault-tolerant connectivity into ATM backbones from Token Ring and Ethernet LANs.



Cisco Systems

Fault-Tolerant ATM Connectivity

The ATM dual PHY module delivers fault tolerance for critical network applications using two unique features:

"Dual-Homed" ATM

Dual PHY ATM allows network administrators to deploy redundant connections from one uplink port. Similar to Fiber Distributed Data Interface (FDDI) dual homing, the Catalyst 5000 dual PHY module provides 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 Interim Local Management Interface (ILMI) communication, data connectivity automatically switches over to the redundant, secondary interface.

LAN Emulation Server Redundancy

Each Catalyst 5000 ATM LANE module delivers redundant LANE services using Cisco's LANE Simple Server Redundancy Protocol (SSRP). LAN Emulation SSRP provides redundancy for all the server components in LAN Emulation—the LECS, the LES, and the BUS. Cisco's 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 Ethernet and Token Ring LANE V.1.0 services. By using this feature, network administrators can easily distribute LANE services across each Catalyst 5000 ATM LANE module. For example, this feature allows scalable distribution of bandwidth-intensive LANE BUS services for multimedia applications.

Flexible Architecture

The LANE protocols and signaling run on onboard processors, permitting software upgrades to meet evolving ATM standards. In delivering on the promise made with the introduction of Ethernet LANE and permanent virtual circuit (PVC) support for Ethernet frames using RFC 1483 encapsulation, Token Ring LANE protocols and signaling can now be configured using the same software image on the ATM module. This capability allows the module to support either Ethernet or Token Ring LANE transport as well as Ethernet PVCs over RFC 1483. Furthermore, with Token Ring LANE support for SRB, parallel active bridge paths over the ATM network can allow dynamic load balancing of traffic between legacy LAN clients and servers as well as a backup path if a link fails.

Future upgrades will provide PVC support for Token Ring with RFC 1483 encapsulation as well as the traffic shaping capability.

Network Management and VLAN/ATM Integration

The superior functionality of the ATM module is supported by a comprehensive set of network management services contained in the CiscoWorks for Switched Internetworks (CWSI) suite of management programs. Using Cisco Discovery Protocol, CWSI builds a topology map of all the interconnected switches and routers to facilitate the configuration of virtual LANs (VLANs) and emulated LANs (ELANs) throughout the switched fabric via CiscoView, Cisco's graphical user interface (GUI). In addition, Cisco's VLAN Trunking Protocol (VTP) provides dynamic mapping between VLANs and ELANs. After VTP sets up a LEC for each ELAN, LECs can register dynamically with the appropriate LES/BUS services.

ATM LANE 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)
- Minimum weight: 3 lb (0.65 kg)
- Maximum weight: 5 lb (2.22 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
- EN 6095
- CSA-C22.2 No. 950–93
- CE Mark

Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- VDE B
- FCC Class B (shielded UTP)
- EN55022 Class A
- VCCI Class 1

Memory

- Flash memory: 4 MB
- DRAM: 16 MB
- Erasable programmable read-only memory (EPROM): 512 KB
- Nonvolatile RAM (NVRAM): 128 KB

Processors

- ATM control processor: Motorola 68EC030
- Segmentation and reassembly (SAR): Two LSI AToMizer 50-MHz RISC processors

Frame-to-Cell Conversion

- ATM adaption layer 5 (AAL5)
- 4096 virtual circuits
- Maximum transmission unit (MTU) of 4470 bytes for Token Ring frames

ATM Standards

- RFC 1483 Logical Link Control (LLC) Subnetwork Access Protocol (SNAP) bridging encapsulation (permanent virtual circuit [PVC]) for Ethernet frames
- ATM Forum LANE V1.0 LEC, LECS, LES, BUS
- UNI 3.0/3.1
- ILMI

Network Management

- Definitions of Managed Objects for Bridges (RFC 1493)
- Evolution of Interfaces Group of MIB-II (RFC 1573)
- Token Ring Extensions to the Managed Objects for Source Routing Bridges (RFC 1525)
- Cisco Discovery Protocol
- Simple Network Management Protocol (SNMP) Management Information Base (MIB) II (RFC 1213)
- AToM MIB (RFC 1695)
- LEC MIB (ATM Forum LANE V1.0)
- Cisco workgroup stack MIB
- Cisco VTP MIB
- Cisco LECS MIB
- Cisco LES/BUS MIB
- ILMI MIB

Indicators

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

Interfaces

- RJ-45 (Category 5 UTP)
- Multimode fiber (SC)
- Single mode fiber (SC)

Optical Specifications

- Multimode Fiber
  - 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
  - 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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