

## Cisco **12000** Series 4-Port OC-12/STM-4 ATM ISE Line Card

**Q.** What powers the new Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** The new Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card features Cisco IP Services Engine (ISE) technology. Cisco ISE is a powerful adaptive network processor technology that combines the hardware performance of application-specific integrated circuits (ASICs) with software flexibility, delivering multiple, robust network edge features while maintaining predictable, line-rate performance.

**Q.** What are the primary applications for the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** Primary applications for the Cisco 12000 Series 4-Port OC-12/STM-4 ISE Line Card include ATM WAN connectivity, low-speed access aggregation, and business DSL aggregation.

**Q.** What are the customer benefits of the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** Customer benefits include:

- *The Cisco 12000 Series ISE*—A unique, edge-optimized, programmable adaptive network processor that combines ASIC hardware performance with software flexibility to accommodate future requirements through simple software upgrades.
- *Advanced traffic management*—Supports per-virtual circuit and per-virtual path (per-VC and per-VP) traffic shaping, including industry-leading, minimum-1-Kbps granularity in compliance with the I.371 granularity definition, allowing flexibility and control over every virtual circuit and virtual path configured.
- *IP quality of service (QoS) features*—Allow customers to apply advanced queuing and bandwidth management using Weighted Random Early Detection (WRED) and Modified Deficit Round Robin (MDRR), including Low-Latency Queuing (LLQ) to individual virtual circuits to avoid congestion and delay. In addition, committed access rate (CAR) and extended access control lists (ACLs) are supported on a per-VC basis on both ingress and egress directions.

**Q.** What is the minimum Cisco IOS<sup>®</sup> Software release required for the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** The minimum Cisco IOS Software release required for the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card is Cisco IOS Software Release 12.0(25S).



**Q.** Does the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card support per-VC queuing?

**A.** The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports full per-VC queuing. Per-VC queuing is automatically configured on the line card. Queue limits are adjustable on a per-VC basis using the Cisco Modular QoS command-line interface (MQC) **queue-limit** command.

**Q.** What traffic management services does the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card support?

**A.** The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports Constant Bit Rate (CBR); Variable Bit Rate, real time (VBR-rt); Variable Bit Rate, non-real time (VBR-nrt); and Unspecified Bit Rate (UBR).

**Q.** Is per-VC/VP traffic shaping supported on the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** Yes. The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports both per-VC and per-VP traffic shaping with a minimum of 1-Kbps granularity, in compliance with the I.371 granularity definition.

**Q.** What ATM management features and Management Information Bases (MIBs) are supported on the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card?

**A.** The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports F4 and F5 operations, administration, and maintenance (OAM) cells, including Alarm Indication Signal/Remote Defect Indicator (AIS/RDI) alarms and loopback cells. The line card is also supported by Cisco Element Management System (EMS) Version 3.1 (or later). Several MIBs are also supported, including:

- Interim Local Management Interface (ILMI) MIB
- Cisco MQC MIB
- ATM MIB (RFC 1695)
- Cisco ATM Adaptation Layer 5 (AAL5) MIB
- Cisco ATM EXT MIB
- Interfaces Group MIB (IF MIB)
- Synchronous Optical Network (SONET) MIB (RFC 2558)
- Cisco IETF ATM2 PVCTRAP MIB
- Multiprotocol Label Switching Traffic Engineering (MPLS TE) MIB
- Cisco Queue MIB

**Q.** What are the different methods for enabling IP over ATM?

**A.** Any of the following IP over ATM internetworking protocols, alone or in combination, may be used:

- RFC 1483 Multiprotocol Encapsulation over AAL5 with support for Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) encapsulation or virtual circuit multiplexing (this implementation of RFC 1483 is for routed protocols only, such as IP and Connectionless Network Service [CLNS])
- RFC 1483 “bridge-styled” permanent virtual circuit (PVC) (half-bridge)
- RFC 1577 Classical IP and Address Resolution Protocol (ARP) over ATM
- MPLS

**Q.** How many queues does the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card support?

**A.** The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports up to 64,000 queues, including 8 class of service (CoS) queues per virtual circuit (4 ports—2000 virtual circuits per port—8 CoS queues per virtual circuit). Segmentation and reassembly (SAR) CoS queues can be configured to work with one of two drop mechanisms: Early Packet Discard (EPD) or WRED.

**Q.** Does the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card support high availability?

**A.** The Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card supports Route Processor Redundancy Plus (RPR+) and Nonstop Forwarding/Stateful Switchover (NSF/SSO).

**Q.** What type of classification does the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card support?

**A.** Similar to other Cisco ISE-based line cards, Cisco MQC classification for the Cisco 12000 Series 4-Port OC-12/STM-4 ATM ISE Line Card includes classification based on: IP Precedence, differentiated services code point (DSCP), MPLS EXP, ACL/xACL, and QoS group. The line card also supports any combination of these.



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