



# Product Bulletin

## Cisco IOS Software Release 12.0(23)S Features: AToM

This product bulletin describes Any Transport over MPLS (AToM) features included in Cisco IOS Software Release 12.0(23)S.

### AToM Features in Cisco IOS Software Release 12.0(23)S

Cisco IOS Release 12.0(23)S includes the following AToM features, which are supported on the Cisco 7200 and 7500 series routers:

- ATM AAL5 over MPLS
- ATM Cell Relay over MPLS
- Ethernet over MPLS
- Frame Relay over MPLS
- HDLC over MPLS
- PPP over MPLS

AAL5 over MPLS and Ethernet over MPLS were introduced in previous releases and on various platforms. AAL5 over MPLS is also supported on the Cisco 12000 series router. Ethernet over MPLS is also supported on the Cisco 12000 series router and the Cisco 10720 router. Table 1 summarizes the features and platform support.

Table 1 Cisco IOS Software Release 12.0(23)S AToM Features

AToM Features	Router Platforms
Any Transport over MPLS: AAL5 over MPLS	Cisco 7200 and 7500 series routers Cisco 12000 Series routers
Any Transport over MPLS: ATM Cell Relay over MPLS (single cell relay, PVC mode)	Cisco 7200 and 7500 series routers
Any Transport over MPLS: Ethernet over MPLS (VLAN mode)	Cisco 7200 and 7500 series routers Cisco 12000 Series routers Cisco 10720 Internet Router
Any Transport over MPLS: Frame Relay over MPLS	Cisco 7200 and 7500 series routers
Any Transport over MPLS: HDLC over MPLS	Cisco 7200 and 7500 series routers
Any Transport over MPLS: PPP over MPLS	Cisco 7200 and 7500 series routers



## Any Transport over MPLS: ATM AAL5 over MPLS

Any Transport over MPLS: ATM AAL5 over MPLS enables a service provider to transport ATM AAL5 frames across an MPLS backbone. This extends the reachability of ATM and allows service providers to aggregate ATM transport and IP transport across a common packet backbone. The service provider can integrate an existing ATM environment with the packet backbone to improve operational efficiency and make use of the high-speed packet interfaces to scale the ATM implementations.

Transporting ATM AAL5 across MPLS networks provides a number of benefits, including:

- ATM PVC extended service.
- Aggregation to a higher speed backbone, such as OC-192, in order to scale ATM implementations.
- Improved operational efficiency. The MPLS backbone becomes the single network that integrates the various existing networks and services.

ATM AAL5 over MPLS transports ATM AAL5 frames across the MPLS backbone instead of cells, creating an efficient transport mechanism of ATM PVCs.

### OAM Cell Emulation

In Release 12.0(23)S, the Cisco 7200 and 7500 series routers support OAM Cell Emulation with AAL5 over MPLS. You configure OAM cell emulation on both PE routers, which emulates a VC by forming two unidirectional LSPs. After OAM cell emulation is enabled on a router, you can configure and manage the ATM VC in the same manner as you would a terminated VC. A VC that has been configured with OAM cell emulation can send loopback cells at configured intervals toward the local CE router. The endpoint can be either of the following:

- End-to-end loopback, which sends OAM cells to the local CE router.
- Segment loopback, which responds to OAM cells to a device along the path between the PE and CE routers.

The OAM cells include the following:

- Alarm indication signal (AIS)
- Remote defect indication (RDI)

These cells identify and report defects along a VC. When a physical link or interface failure occurs, intermediate nodes insert OAM AIS cells into all the downstream devices affected by the failure. When a router receives an AIS cell, it marks the logical interface down and sends an RDI cell to let the remote end know about the failure.

Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: ATM AAL5 over MPLS functionality for Cisco 7200 and 7500 series routers and the Cisco 12000 series routers.

## Any Transport over MPLS: ATM Cell Relay over MPLS

Any Transport over MPLS: ATM Cell Relay over MPLS enables a service provider to carry ATM cells transparently across the MPLS backbone. This functionality is supported for single ATM cells in PVC mode only. ATM cell relay treats each ATM cell as a data packet and transports it across the MPLS network. This allows cells to be carried, regardless of which adaptation layer is used underneath. ATM Cell Relay over MPLS is more versatile than ATM AAL5 over MPLS, which carries only AAL5 frames. Other AAL types, such as AAL2 and AAL1, cannot be carried across the packet backbone, even if quality of service (QoS) is not an issue.

ATM Cell Relay over MPLS also allows the signaling and Operation, Administration, and Maintenance (OAM) cells to pass transparently across the packet network.



Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: ATM Cell Relay over MPLS functionality for Cisco 7200 and 7500 series routers.

### Any Transport over MPLS: Ethernet over MPLS

Any Transport over MPLS: Ethernet over MPLS enables a service provider to transport Ethernet VLAN packets across an MPLS backbone. This extends the reachability of Ethernet and allows service providers to offer Ethernet as a service to end customers.

A number of applications involve transporting raw Ethernet packets across MPLS networks, including:

- Metro Ethernet service
- Point-to-point Ethernet service
- LAN or broadcast domain extensions
- Remote peering and distributed network access points (NAPs)

The provider edge (PE) router does not need to peer with the customer device. The service provider does not carry any customer IP routing information but instead transports the Layer 2 frames across the network. This is analogous to providing a Layer 2 circuit point-to-point.

Other MPLS features can be enabled on the PE router with AToM support, such as MPLS Virtual Private Networks (VPNs). For end users, the connectivity to remote sites is the same as if they were on the same LAN, and they do not have to modify their applications.

Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: Ethernet over MPLS functionality for Cisco 7200 and 7500 series routers, the Cisco 12000 series routers, and the Cisco 10720 Internet Router.

### Any Transport over MPLS: Frame Relay over MPLS

Any Transport over MPLS: Frame Relay over MPLS enables a service provider to transport Frame Relay frames across an MPLS backbone. This extends the reachability of Frame Relay and allows service providers to aggregate frame transport across a common packet backbone. The service provider can integrate an existing Frame Relay environment with the packet backbone to improve operational efficiency and to implement the high-speed packet interfaces to scale the Frame Relay implementations.

Transporting Frame Relay frames across MPLS networks provides a number of benefits, including:

- Frame Relay extended service.
- Aggregation to a higher speed backbone, such as OC-192, in order to scale Frame Relay implementations.
- Improved operational efficiency. The MPLS backbone becomes the single network that integrates the various existing networks and services.

The PE router does not need to peer with the customer device. The provider does not carry any customer IP routing information but instead transports the Layer 2 frames across the network. The provider backbone behaves like a Layer 2 switch.

Other MPLS features can be enabled on the PE router, such as MPLS VPNs in conjunction with AToM support.

Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: Frame Relay over MPLS functionality for Cisco 7200 and 7500 series routers.



### Any Transport over MPLS: HDLC over MPLS

Any Transport over MPLS: HDLC over MPLS allows you to transport HDLC frames across an MPLS backbone. Because this feature allows the transport of Layer 2 frames, it can be used to build virtual leased lines, regardless of the payload inside the PPP frame.

The service provider can integrate an existing Layer 2 environment with the MPLS backbone to improve operational efficiency and make use of the high-speed packet interfaces to scale the Layer 2 implementations.

Transporting HDLC across MPLS networks provides a number of benefits, including:

- Leased line extended service.
- Aggregation to a higher speed backbone, such as OC-192, in order to scale HDLC/leased line implementations.
- Improved operational efficiency. The MPLS backbone becomes the single network that integrates the various existing networks and services.

Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: HDLC over MPLS functionality for Cisco 7200 and 7500 series routers.

### Any Transport over MPLS: PPP over MPLS

Any Transport over MPLS: PPP over MPLS allows service providers to move PPP frames across an MPLS backbone. Because this feature allows transport of Layer 2 frames, it can be used to build virtual leased lines, regardless of the payload inside the PPP frame.

The service provider can integrate an existing Layer 2 environment with the MPLS backbone to improve operational efficiency and make use of the high-speed packet interfaces to scale the Layer 2 implementations.

Transporting PPP packets across an MPLS network provides a number of benefits, including:

- ATM PVC extended service.
- Aggregation to a higher speed backbone, such as OC-192, in order to scale PPP/leased line implementations.
- Improved operational efficiency. The MPLS backbone becomes the single network that integrates the various existing networks and services.

Cisco IOS Release 12.0(23)S supports Any Transport over MPLS: PPP over MPLS functionality for Cisco 7200 and 7500 series routers.

### Additional Documentation

For more information about AToM and Cisco IOS software Release 12.0S, refer to the following sources:

- *Release Notes for Cisco IOS Release 12.0S*

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/relnote/7000fam/rn120s.htm>

- *Any Transport over MPLS (AToM)*

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120s/120s23/atom/index.htm>



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