



Configuring the Multiprotocol over ATM Server

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The Multiprotocol over ATM (MPOA) server (MPS) supplies the forwarding information used by the MPOA clients (MPCs). The MPS responds with the information after receiving a query from a client. To support the query and response functions, MPOA has adopted the Next Hop Resolution Protocol (NHRP). The MPS on the router can also terminate shortcuts.

For a complete description of the commands in this chapter, refer to the the *Cisco IOS Switching Services Command Reference*. To locate documentation of other commands that appear in this chapter, use the command reference master index or search online.

To identify the hardware platform or software image information associated with a feature, use the Feature Navigator on Cisco.com to search for information about the feature or refer to the software release notes for a specific release. For more information, see the section “[Identifying Supported Platforms](#)” in the chapter “Using Cisco IOS Software.”

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How MPS Works

The MPS software module implements the functionality of the MPS in compliance with the ATM Forum MPOA specification. The following sections describe the functions of MPS:

- [MPS-NHRP-Routing Interaction, page 2](#)
- [Shortcut Domains, page 2](#)



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MPS-NHRP-Routing Interaction

MPS must interact with the NHRP module in the router to smoothly propagate MPOA/NHRP packets end to end. MPOA frames are identical to NHRP frames except for some specific op-codes and extensions for MPOA.

The following process explains the interaction of MPS and NHRP:

1. MPS converts MPOA resolution requests to NHRP requests and sends it either to the next hop MPS or to the Next Hop Server (NHS), depending on the configuration. MPS searches for the next hop routing information to determine the interface and sends the packet with correct encapsulation to an MPS or an NHS.
2. NHS sends resolution requests to MPS when the next hop is on a LAN Emulation (LANE) cloud or when NHS is unsure of the packet destination. MPS may do further processing, such as prompt NHS to terminate the request or throw away the packet.
3. NHS sends resolution replies to MPS when the next hop interface is LANE or when the replies terminate in the router. Then MPS sends an MPOA resolution reply to the MPC.

Shortcut Domains

Within a router, it is possible to permit shortcuts between one group of LAN Emulation Clients (LECs) and deny it between some other groups of LECs. Cisco introduces a notion of network ID associated with an MPS. By default, all the MPSs in a router get a network ID of 1.

If the administrator wants to segregate traffic, then MPSs can be given different network IDs, in effect preventing shortcuts between LECs served by different MPSs. This can be configured in the definition of an MPS database.

If a router has both MPS and NHRP configured, then the same network ID is required to facilitate requests, replies, and shortcuts across the MPS and NHRP. The interface-specific NHRP command (**ip nhrp network-id**) must be the same for an MPS; otherwise, there will be a disjointed network.

MPS Configuration Task List

To configure an MPS on your network, perform the following tasks:

- [Configuring the ELAN ID, page 2](#) (Required)
- [Configuring the MPS, page 3](#) (Required)
- [Configuring the MPS Variables, page 3](#) (Optional)
- [Monitoring and Maintaining the MPS, page 4](#) (Optional)

Configuring the ELAN ID

For MPOA to work properly, a LANE client must have an ELAN ID for all ELANs represented by the LANE clients. To configure an ELAN ID, use either of the following commands in lane database configuration mode or in interface configuration mode when starting up the LAN Emulation Client Server (LECS) for that ELAN:

Command	Purpose
Router(lane-config-dat)# name <i>elan-name</i> elan-id <i>id</i>	Configures the ELAN ID in the LECS database to participate in MPOA.
Router(lane-config-dat)# lane server-bus { ethernet tokenring } <i>elan-name</i> [elan-id <i>id</i>]	Configures the LAN Emulation Server (LES) with the ELAN ID to participate in MPOA.

**Caution**

If an ELAN ID is supplied by both commands, make sure that the ELAN ID matches in both.

Configuring the MPS

To configure an MPS, use the following commands beginning in global configuration mode. The MPS starts functioning only after it is attached to a specific hardware interface:

	Command	Purpose
Step 1	Router(config)# mpoa server config name <i>mps-name</i>	In global configuration mode, defines an MPS with the specified name.
Step 2	Router(config)# interface atm { <i>slot/port</i> <i>number</i> }	Specifies the ATM interface to attach the MPS.
Step 3	Router(config-if)# mpoa server name <i>mps-name</i>	In interface configuration mode, attaches the MPS to the ATM interface.
Step 4	Router(config-if)# interface atm { <i>slot/port.subinterface-number</i> <i>number.subinterface-number</i> }	Specifies the ATM interface to bind the MPS to a LEC.
Step 5	Router(config-subif)# lane client mpoa server name <i>mps-name</i>	In subinterface configuration mode, binds a LANE client to the specified MPS.

Configuring the MPS Variables

An MPS must be defined with a specified name before you can change the MPS variables specific to that MPS.

To change MPS variables specific only to a particular MPS, use the following commands beginning in MPS configuration mode:

	Command	Purpose
Step 1	Router(mpoa-server-config)# mpoa server config name <i>mps-name</i>	Defines an MPS with the specified name.
Step 2	Router(mpoa-server-config)# atm-address <i>atm-address</i>	(Optional) Specifies the control ATM address that the MPS should use (when it is associated with a hardware interface).
Step 3	Router(mpoa-server-config)# holding-time <i>time</i>	(Optional) Specifies the holding time value for the MPS-p7 variable of the MPS.

	Command	Purpose
Step 4	Router(mpoa-server-config)# keepalive-lifetime <i>time</i>	(Optional) Specifies the keepalive lifetime value for the MPS-p2 variable of the MPS.
Step 5	Router(mpoa-server-config)# keepalive-time <i>time</i>	(Optional) Specifies the keepalive time value for the MPS-p1 variable of the MPS.
Step 6	Router(mpoa-server-config)# network-id <i>id</i>	(Optional) Specifies the network ID of the MPS.

Monitoring and Maintaining the MPS

To monitor and maintain the configuration of an MPS, use the following commands in EXEC mode, as needed:

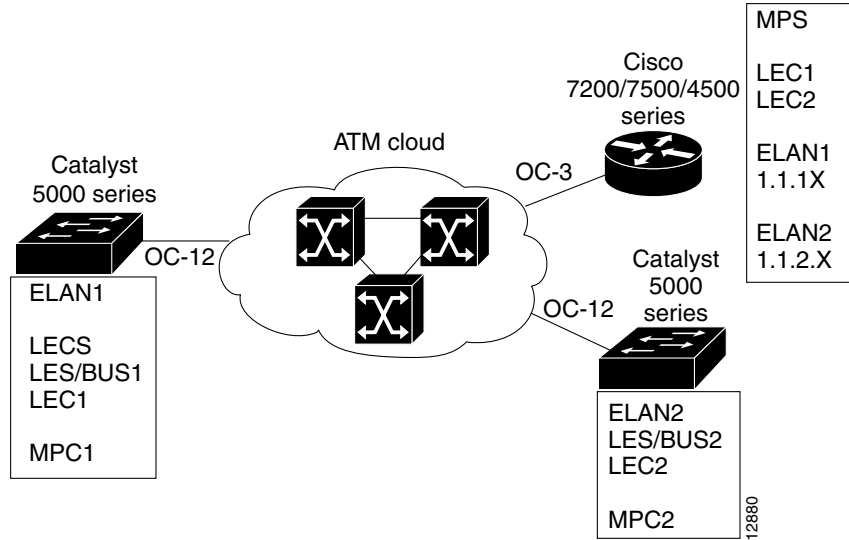
Command	Purpose
Router# show mpoa default-atm-addresses	Displays default ATM addresses for an MPS.
Router# show mpoa server [<i>name mps-name</i>]	Displays information about a specified server or all servers depending on the specified name of the required server.
Router# show mpoa server [<i>name mps-name</i>] cache [<i>ingress egress</i>] [<i>ip-address ip-address</i>]	Displays ingress and egress cache entries associated with a server.
Router# show mpoa server [<i>name mps-name</i>] statistics	Displays all the statistics collected by a server including the ingress and egress cache entry creations, deletions, and failures.
Router# clear mpoa server [<i>name mps-name</i>] cache [<i>ingress egress</i>] [<i>ip-addr ip-addr</i>]	Clears cache entries.
Router# mpoa server name <i>mps-name</i> trigger ip-address <i>ip-address</i> [<i>mpc-address mpc-address</i>]	Originates an MPOA trigger for the specified IP address to the specified client. If a client is not specified, the MPOA is triggered to all the clients.

MPS Configuration Example

This section contains an example of the commands needed to configure an MPS. The lines beginning with exclamation points (!) are comments explaining the command shown on the following line.

[Figure 35](#) shows an example of how you can configure your system to utilize MPOA.

Figure 35 Example of an MPOA Configuration



The following example configures the MPS and attaches the MPS to a hardware interface:

```
! Define the MPS "MYMPS"
mpoa server config name MYMPS
! Leave everything as default
exit
! Enter into interface config mode
interface ATM 1/0
! Attach MPS MYMPS to the HW interface
mpoa server name MYMPS
! Go back up to global config mode
exit
```

The following example shows a typical MPS configuration file:

```
version 11.3
hostname MPS
! Define the MPS "mps"
mpoa server config name mps
! Specify the ATM interface to which the MPS is attached
interface ATM4/0
  no ip address
  atm pvc 1 0 5 qsaal
  atm pvc 2 0 16 ilmi
  lane config auto-config-atm-address
  mpoa server name mps
! Specify the ATM interface that contains the LEC to which you will bind the MPS
interface ATM4/0.1 multipoint
  ip address 1.1.1.2 255.255.255.0
  lane client mpoa server name mps
  lane client ethernet elan1
interface ATM4/0.2 multipoint
  ip address 1.1.2.1 255.255.255.0
  lane client mpoa server name mps
  lane client ethernet elan2
end
```

Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS Asynchronous Transfer Mode Command Reference* at http://www.cisco.com/en/US/docs/ios/atm/command/reference/atm_book.html. For information about all Cisco IOS commands, use the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or a Cisco IOS master commands list.

- **clear mpoa server cache**
- **debug mpoa server**
- **lane client mpoa server name**
- **mpoa server config name**
- **mpoa server name**
- **show mpoa server**
- **show mpoa server cache**
- **show mpoa server statistics**

Feature Information for the Multiprotocol over ATM Client

Table 19 lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Releases 12.2(1), 12.0(3)S, 12.2(33)SRA, 12.2(33)SXH, or later releases appear in the table.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note

Table 19 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 19 Feature Information for the Multiprotocol over ATM Client

Feature Name	Releases	Feature Information
Multiprotocol over ATM Server	12.0(1) 12.1(1)E	<p>The Multiprotocol over ATM (MPOA) server (MPS) supplies the forwarding information used by the MPOA clients (MPCs). The MPS responds with the information after receiving a query from a client. To support the query and response functions, MPOA has adopted the Next Hop Resolution Protocol (NHRP). The MPS on the router can also terminate shortcuts.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> • MPS-NHRP-Routing Interaction, page 2 • Shortcut Domains, page 2 • Configuring the ELAN ID, page 2 • Configuring the MPS, page 3 • Configuring the MPS Variables, page 3 • Monitoring and Maintaining the MPS, page 4 <p>The following commands were introduced or modified: clear mpoa server cache, debug mpoa server, lane client mpoa server name, mpoa server config name, mpoa server name, show mpoa server, show mpoa server cache, show mpoa server statistics.</p>

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