



## Configuring the Multiprotocol over ATM Server

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 *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.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## 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

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

### 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.

**Caution**

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

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

## 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:

### SUMMARY STEPS

1. Router(config)# **mpos server config namemps-name**
2. Router(config)# **interface atm** {*slot/port* | *number* }
3. Router(config-if)# **mpos server namemps-name**
4. Router(config-if)# **interface atm** {*slot/port.subinterface-number* | *number.subinterface-number* }
5. Router(config-subif)# **lane client mpos server namemps-name**

### DETAILED STEPS

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

### SUMMARY STEPS

1. Router(mpoa-server-config)# **mpoa server config name***mps-name*
2. Router(mpoa-server-config)# **atm-address***atm-address*
3. Router(mpoa-server-config)# **holding-time***time*
4. Router(mpoa-server-config)# **keepalive-lifetime***time*
5. Router(mpoa-server-config)# **keepalive-time***time*
6. Router(mpoa-server-config)# **network-id***id*

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	Router(mpoa-server-config)# <b>mpoa server config name</b> <i>mps-name</i>	Defines an MPS with the specified name.
<b>Step 2</b>	Router(mpoa-server-config)# <b>atm-address</b> <i>atm-address</i>	(Optional) Specifies the control ATM address that the MPS should use (when it is associated with a hardware interface).
<b>Step 3</b>	Router(mpoa-server-config)# <b>holding-time</b> <i>time</i>	(Optional) Specifies the holding time value for the MPS-p7 variable of the MPS.
<b>Step 4</b>	Router(mpoa-server-config)# <b>keepalive-lifetime</b> <i>time</i>	(Optional) Specifies the keepalive lifetime value for the MPS-p2 variable of the MPS.
<b>Step 5</b>	Router(mpoa-server-config)# <b>keepalive-time</b> <i>time</i>	(Optional) Specifies the keepalive time value for the MPS-p1 variable of the MPS.
<b>Step 6</b>	Router(mpoa-server-config)# <b>network-id</b> <i>id</i>	(Optional) Specifies the network ID of the MPS.

## Monitoring and Maintaining the MPS

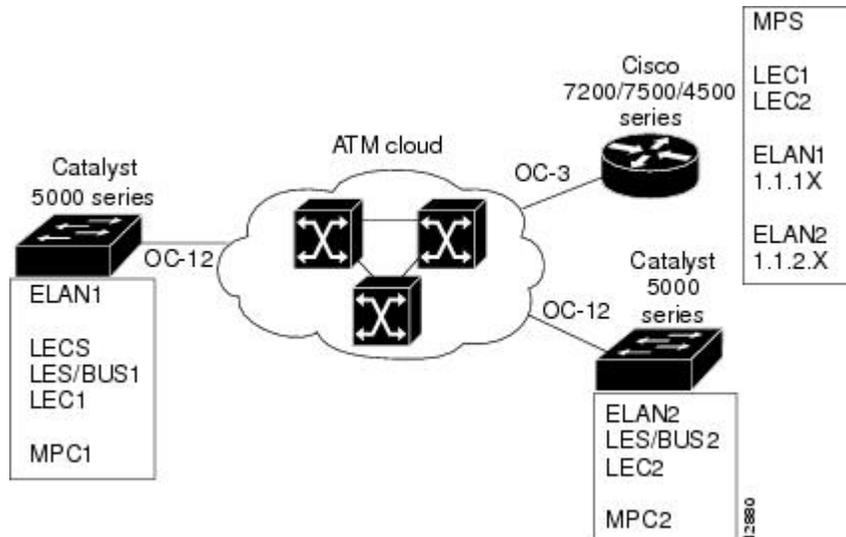
To monitor and maintain the configuration of an MPS, use the following commands in EXEC mode, as needed:

Command	Purpose
Router# <b>show mpoa default-atm-addresses</b>	Displays default ATM addresses for an MPS.
Router# <b>show mpoa server</b> [ <b>name</b> <i>mps-name</i> ]	Displays information about a specified server or all servers depending on the specified name of the required server.
Router# <b>show mpoa server</b> [ <b>name</b> <i>mps-name</i> ] <b>cache</b> [ <b>ingress</b>   <b>egress</b> ] [ <b>ip-address</b> <i>ip-address</i> ]	Displays ingress and egress cache entries associated with a server.
Router# <b>show mpoa server</b> [ <b>name</b> <i>mps-name</i> ] <b>statistics</b>	Displays all the statistics collected by a server including the ingress and egress cache entry creations, deletions, and failures.
Router# <b>clear mpoa server</b> [ <b>name</b> <i>mps-name</i> ] <b>cache</b> [ <b>ingress</b>   <b>egress</b> ] [ <b>ip-addr</b> <i>ip-addr</i> ]	Clears cache entries.
Router# <b>mpoa server name</b> <i>mps-name</i> <b>trigger ip-address</b> <i>ip-address</i> [ <b>mpc-address</b> <i>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. The figure below shows an example of how you can configure your system to utilize MPOA.

**Figure 1: 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
```

## Feature Information for the Multiprotocol over ATM Client

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [http://www.cisco.com/go/featurenavigator](#). An account on Cisco.com is not required.

**Table 1: 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 commands were introduced or modified: <b>clear mpoa server cache</b>, <b>debug mpoa server</b>, <b>lane client mpoa server name</b>, <b>mpoa server config name</b>, <b>mpoa server name</b>, <b>show mpoa server</b>, <b>show mpoa server cache</b>, <b>show mpoa server statistics</b>.</p>

