ARP Commands on Cisco IOS-XR Software

This chapter describes the commands used to configure and monitor the Address Resolution Protocol (ARP).

arp

To add a permanent entry in the Address Resolution Protocol (ARP) cache, use the **arp** command in global configuration mode. To remove an entry from the ARP cache, use the **no** form of this command.

arp *ip-address hardware-address encapsulation-type* [**alias**]

no arp *ip-address hardware-address encapsulation-type* [**alias**]

Syntax Description

ip-address	IP address in four-part dotted-decimal format that corresponds to the local data-link address (a 32-bit address).
hardware-address	Local data-link address (a 48-bit address), such as 0800.0900.1834.
encapsulation-type	Encapsulation type. For Ethernet interfaces, this is typically the **arpa** keyword. For FDDI and Token Ring interfaces, this is the **snap** keyword.
alias	(Optional) Causes the software to respond to ARP requests as if it were the owner of both the specified IP address and hardware address, whether proxy ARP is enabled or not.

Defaults

No entries are permanently installed in the ARP cache.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

The software uses ARP cache entries to translate 32-bit IP addresses into 48-bit hardware addresses.

Because most hosts support dynamic resolution, you generally need not specify static ARP cache entries.

If the **alias** keyword is not specified, the entry is just a static entry and will not learn the new hardware address for that IP address. The software does not respond to any ARP requests received for that IP address unless proxy ARP is enabled on the interface on which the request is received. When proxy ARP is enabled, the software responds to ARP requests for that IP address with its own local interface hardware address.

To remove all nonstatic entries from the ARP cache, use the **clear arp-cache** EXEC command.

Examples

The following is an example of a static ARP entry for a typical Ethernet host:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# arp 192.168.7.19 0800.0900.1834 arpa
```

Related Commands

Command	Description
clear arp-cache	Deletes all dynamic entries from the ARP cache.
mpls on	Enables MPLS on ARP interfaces.
show arp (cache)	Displays the ARP cache.

arp timeout

To specify how long dynamic entries learned on an interface remain in the Address Resolution Protocol (ARP) cache, use the **arp timeout** command in interface configuration mode. To remove the **arp timeout** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

arp timeout *seconds*

no arp timeout *seconds*

Syntax Description

seconds	Time, in seconds, for which an entry remains in the ARP cache. The range is from 0 to 4294967. A value of 0 means that entries are never cleared from the cache. The default is 14400.

Defaults

Entries remain in the ARP cache for 14400 seconds (4 hours).

Command Modes

Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

This command is ignored when issued on interfaces that do not use ARP. Also, ARP entries that correspond to the local interface or that are statically configured by the user never time out.

The **show interfaces** command displays the ARP timeout value in hours:minutes:seconds, as follows:

```
ARP type: ARPA, ARP Timeout 04:00:00
```

Examples

The following example shows how to set the ARP timeout to 3600 seconds to allow entries to time out more quickly than the default:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0
RP/0/RP0/CPU0:router(config-if)# arp timeout 3600
```

Related Commands

Command	Description
clear arp-cache	Deletes all dynamic entries from the ARP cache.

Command	Description
show arp (cache)	Displays the entries in the ARP table.
show interfaces	Displays statistics for all interfaces configured on the networking device.

clear arp-cache

To delete all dynamic entries from the Address Resolution Protocol (ARP) cache, to clear the fast-switching cache, and to clear the IP route cache, use the **clear arp-cache** command in EXEC mode.

clear arp-cache [**traffic** [*interface-instance* | **location** *node-id*]] [**location** *node-id*]

Syntax Description

traffic	(Optional) Deletes traffic statistics on the specified interface.
interface-instance	(Optional) Specifies ARP entries matching the interface. The *interface-instance* argument is entered in the rack/slot/module/port notation.
location *node-id*	(Optional) Clears the ARP entries for a specified location. The *nodeID* argument is entered in the rack/slot/module notation.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

When issued without keywords or arguments, the **clear arp-cache** command clears all entries in the ARP cache.

Examples

The following example shows how to remove all dynamic entries from the ARP cache and clears the fast-switching cache:

```
RP/0/RP0/CPU0:router# clear arp-cache
```

The following example shows how to remove traffic statistic entries from the ARP cache that match the specified interface:

```
RP/0/RP0/CPU0:router# clear arp-cache traffic POS0/2/0/1
```

The following example shows how to remove entries from the ARP cache that match the specified location:

```
RP/0/RP0/CPU0:router# clear arp-cache location 0/RP1/CPU0
```

Related Commands

Command	Description
arp	Adds a permanent entry in the ARP cache.
show arp (cache)	Displays the ARP cache.

proxy-arp

To enable proxy Address Resolution Protocol (ARP) on an interface, use the **proxy-arp** command in interface configuration mode. To disable proxy ARP on the interface, use the **disable** keyword. To remove the **proxy-arp** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

proxy-arp [**enable** | **disable**]

no proxy-arp

Syntax Description

enable	(Optional) Enables the functionality of the command. This is the default.
disable	(Optional) Disables the functionality of the command.

Defaults

Proxy ARP is enabled on all interfaces.

Command Modes

Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

When proxy ARP is disabled, the networking device responds to ARP requests received on an interface only if one of the following conditions is met:

- The target IP address in the ARP request is the same as the interface IP address on which the request is received.
- The target IP address in the ARP request has a statically configured ARP alias.

When proxy ARP is enabled, the networking device also responds to ARP requests that meet all of the following conditions:

- The target IP address is not on the same physical network (LAN) on which the request is received.
- The networking device has one or more routes to the target IP address.
- All of the routes to the target IP address go through interfaces other than the one on which the request is received.

Using the **no** command removes the specified command from the configuration file and restores the system to its default condition with respect to the command. We recommend that you use the **disable** keyword rather than the **no** command to disable the functionality of the command. The **no** form of a command is not stored in the configuration file. Instead, the command with the **disable** keyword is stored in the configuration file.

Examples

The following example shows how to enable proxy ARP on MgmtEth interface 0/RP1/CPU0/0:

```
RP/0/RP0/CPU0:router(config)# configure
RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0
RP/0/RP0/CPU0:router(config-if)# proxy-arp
```

show arp (cache)

To display the Address Resolution Protocol (ARP) cache, use the **show arp** command in EXEC mode.

show arp [*ip-address* [**location** *node-id*] | *hardware-address* [**location** *node-id*] | **traffic** [**location** *node-id* | *interface-instance*] | **trace** [**error** [**location** *node-id*] | **dev** [**location** *node-id*] | **events** [**location** *node-id*] **table** [**location** *node-id*] | **location** *node-id*]] | *type instance* | **location** *node-id*]

Syntax Description

ip-address	(Optional) Displays ARP entries that match the IP address.
location *node-id*	(Optional) Displays the ARP entries for a specific location. The *nodeID* argument is entered in the rack/slot/module notation.
hardware-address	(Optional) Displays ARP entries that match the 48-bit MAC address.
traffic	(Optional) Displays ARP traffic statistics.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance: • Physical interface instance. Naming notation is rack/slot/module/port and a slash mark between values is required as part of the notation. – rack: Chassis number of the rack. – slot: Physical slot number of the line card. – module: Module number. A Physical Layer Interface Module (PLIM) is always 0. – port: Physical port number of the interface. **Note** In references to a Management Ethernet interface located on a Route Processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0. • Virtual interface instance. Number range will vary depending on interface type. For more information about the syntax for the router, use the question mark (**?**) online help function.
trace	(Optional) Displays ARP entries in the buffer.
error	(Optional) Specifies TBD
dev	(Optional) Specifies TBD
events	(Optional) Specifies TBD
table	(Optional) Specifies TBD

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

ARP establishes correspondences between network addresses (an IP address, for example) and Ethernet hardware addresses. A record of each correspondence is kept in a cache for a predetermined amount of time and then discarded.

The **show arp** *type instance* form of this command does not support the **location** *nodeID* keyword and argument. This command also displays the ARP table information. The **show arp** command and the **show arp** *type instance* command display the same information.

Examples

The following is sample output from the **show arp** command:

```
RP/0/RP0/CPU0:router# show arp

Address         Age        Hardware Addr   State      Type  Interface
10.4.9.2        00:59:32   0030.7131.abfc  Dynamic    ARPA  MgmtEth0/RP0/CPU0/0
10.4.9.1        00:59:32   0000.0c07.ac24  Dynamic    ARPA  MgmtEth0/RP0/CPU0/0
10.4.9.99       00:12:49   0007.ebea.44d0  Dynamic    ARPA  MgmtEth0/RP0/CPU0/0
10.4.9.199      -          0001.c9eb.dffe  Interface  ARPA  MgmtEth0/RP0/CPU0/0
```

The following is sample output from the **show arp** command with the *type instance* argument:

```
RP/0/RP0/CPU0:router# show arp MgmtEth 0/RP1/CPU0/0

Address         Age        Hardware Addr   State      Type  Interface
10.4.9.2        00:35:55   0030.7131.abfc  Dynamic    ARPA  MgmtEth0/RP1/CPU0/0
10.4.9.1        00:35:55   0000.0c07.ac24  Dynamic    ARPA  MgmtEth0/RP1/CPU0/0
10.4.9.99       00:49:12   0007.ebea.44d0  Dynamic    ARPA  MgmtEth0/RP1/CPU0/0
10.4.9.199      -          0001.c9eb.dffe  Interface  ARPA  MgmtEth0/RP1/CPU0/0
```

The following is sample output from the **show arp** command with the *hardware-address* designation:

```
RP/0/RP0/CPU0:router# show arp 0005.5f1d.8100

Address Age Hardware Addr State Type Interface
172.16.7.2 - 0005.5f1d.8100 Interface ARPA GigabitEthernet2/0/1/2
```

The following is sample output from the **show arp** command with the **location** keyword and *nodeID* argument:

```
RP/0/RP0/CPU0:router# show arp location 0/2/CPU0

Address Age Hardware Addr State Type Interface
192.168.15.1 - 00dd.00ee.00ff Alias ARPA
192.168.13.1 - 00aa.00bb.00cc Static ARPA
172.16.7.1 00:35:49 0002.fc0e.9600 Dynamic ARPA GigabitEthernet2/0/1/2
172.16.7.2 - 0005.5f1d.8100 Interface ARPA GigabitEthernet2/0/1/2
```

The following is sample output from the **show arp** command with the **traffic** keyword:

```
RP/0/RP0/CPU0:router# show arp traffic

ARP statistics:
  Recv: 2691 requests, 91 replies
```

```
  Sent: 67 requests, 2 replies (0 proxy, 1 gratuitous)
  Resolve requests rcvd: 1
  Resolve requests dropped: 0
  Errors: 0 out of memory, 0 no buffers

ARP cache:
  Total ARP entries in cache: 4
  Dynamic: 3, Interface: 1, Standby: 0
  Alias: 0,   Static: 0

  IP Packet drop count for node 0/0/CPU0: 1
```

The following is sample output from the **show arp** command with the **traffic** and **location** keywords and *nodeID* argument:

```
RP/0/RP0/CPU0:router# show arp traffic location 0/2/CPU0

ARP statistics:
Recv: 0 requests, 1 replies
Sent: 0 requests, 2 replies (0 proxy, 2 gratuitous)
Resolve requests rcvd: 0
Resolve requests dropped: 0
Errors: 0 out of memory, 0 no buffers

ARP cache:
Total ARP entries in cache: 4
Dynamic: 1, Interface: 1, Static: 1
Alias: 1, Standby: 0

  IP Packet drop count for node 0/2/CPU0: 1
```

Related Commands

Command	Description
arp	Adds a permanent entry to the ARP cache.
clear arp-cache	Deletes all dynamic entries from the ARP cache.