ARP Commands

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

For detailed information about ARP concepts, configuration tasks, and examples, refer to the *Cisco IOS XR IP Addresses and Services Configuration Guide for the Cisco XR 12000 Series Router*.

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, enter the **no** form of this command.

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

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

Syntax Description

vrf	(Optional) Specifies VPN routing and forwarding (VRF) instance.
vrf-name	(Optional) VRF instance that identifies a VPN.
ip-address	IPv4 (network layer) address for which a permanent entry is added to the ARP cache. Enter the IPv4 address in a four-part dotted-decimal format that corresponds to the local data-link address (a 32-bit address).
hardware-address	Hardware (data link layer) address that the IPv4 address is linked to. Enter the local data-link address (a 48-bit address), such as 0800.0900.1834.
encapsulation-type	Encapsulation type. The encapsulation types are: • arpa • srp • srpa • srpb For Ethernet interfaces, this is typically the arpa 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.

Command Default

No entries are permanently installed in the ARP cache.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.2	This command was supported.
Release 3.3.0	The **vrf** keyword and *vrf-name* argument were added. The encapsulation information was added.

Usage Guidelines   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.

Static entries are permanent entries that map a network layer address (IPv4 address) to a data-link layer address (MAC address). If the **alias** keyword is specified when creating the entry, the interface to which the entry is attached will act as if it is the owner of the specified addresses, that is, it will respond to ARP request packets for this network layer address with the data link layer address in the entry.

The software does not respond to any ARP requests received for the specified 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 with its own local interface hardware address.

To remove all nonstatic entries from the ARP cache, enter the clear arp-cache, on page 7 in EXEC mode.

Task ID

Task ID	Operations
cef	read, write

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

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

Related Commands

Command	Description
clear arp-cache, on page 7	Deletes all dynamic entries from the ARP cache.
show arp, on page 12	Displays the ARP cache.

arp purge-delay

To delay purging Address Resolution Protocol (ARP) entries when an interface goes down, use the **arp purge-delay** command in interface configuration mode. To turn off the purge delay feature, use the **no** form of this command.

arp purge-delay *value*

no arp purge-delay *value*

Syntax Description

value	Sets the purge delay time in seconds. Range is 1 to 65535.

Command Default

Default value is off.

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

Use the **arp purge-delay** command to delay purging ARP entries when an interface goes down. If the interface comes up within the delay time, then the ARP entries are restored to prevent packet loss with Equal Cost Multipath (ECMP) configured.

Task ID

Task ID	Operations
cef	read, write

Examples

The following is an example of setting the purge delay to 50 seconds:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0
RP/0/0/CPU0:router(config-if)# arp purge-delay 50
```

arp timeout

To specify how long dynamic entries learned on an interface remain in the Address Resolution Protocol (ARP) cache, enter 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, enter the **no** form of this command.

arp timeout *seconds*

no arp timeout *seconds*

Syntax Description

seconds	Indicates the time, in seconds, for which an entry remains in the ARP cache. Range is 30 to 4294967295.

Command Default

Entries remain in the ARP cache for 14,400 seconds (4 hours).

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

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 **arp timeout** command applies only to the interface that is entered. When the timeout is changed for an interface the change applies only to that interface.

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

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

Task ID

Task ID	Operations
cef	read, write

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/0/0/CPU0:router# configure
```

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arp timeout

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

Related Commands

Command	Description
clear arp-cache, on page 7	Deletes all dynamic entries from the ARP cache.
show arp, on page 12	Displays the ARP cache.
show interfaces	Displays statistics for all interfaces configured on the networking device. For information on using the **show interfaces** command, see Cisco IOS XR software *Interface and Hardware Component Command Reference*.

clear arp-cache

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

clear arp-cache {**traffic** *type interface-path-id*| **location** *node-id*}

Syntax Description

traffic	(Optional) Deletes traffic statistics on the specified interface.
t ype	Interface type. For more information, use the question mark (?) online help function.

interface- path-id	Either a physical interface instance or a virtual interface instance as follows:
	
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.
	
	  ◦ *rack*: Chassis number of the rack.
	
	  ◦ *slot*: Physical slot number of the modular services card or 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 varies depending on interface type.
	
	For more information about the syntax for the router, use the question mark (?) online help function.

location *node-id*	Clears the ARP entries for a specified location. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

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Release	Modification
Release 3.3.0	The **location** keyword and *node-id* argument were made mandatory.

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

Task ID

Task ID	Operations
cef	execute

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

```
RP/0/0/CPU0:router# clear arp-cache traffic gigabitEthernet 0/1/5/1 location 0/1/CPU0
```

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

```
RP/0/0/CPU0:router# clear arp-cache location 0/1/CPU0
```

Related Commands

Command	Description
arp, on page 2	Adds a permanent entry in the ARP cache.
show arp, on page 12	Displays the ARP cache.

local-proxy-arp

To enable local proxy Address Resolution Protocol (ARP) on an interface, enter the **local-proxy-arp** command in interface configuration mode. To disable local proxy ARP on the interface, enter the **no** form of this command.

local-proxy-arp

no local-proxy-arp

Syntax Description   This command has no keywords or arguments.

Command Default   Local proxy ARP is disabled on all interfaces.

Command Modes   Interface configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines   When local proxy ARP is enabled, the networking device responds to ARP requests that meet all the following conditions:

- The target IP address in the ARP request, the IP address of the ARP source, and the IP address of the interface on which the ARP request is received are on the same Layer 3 network.

- The next hop for the target IP address is through the same interface as the request is received.

Typically, local proxy ARP is used to resolve MAC addresses to IP addresses in the same Layer 3 network such as, private VLANs that are Layer 2-separated. Local proxy ARP supports all types of interfaces supported by ARP and unnumbered interfaces.

Using the **no** form of the command removes the specified command from the configuration file and restores the system to its default condition with respect to the command.

Task ID

Task ID	Operations
cef	read, write

Examples   The following example shows how to enable local proxy ARP on TenGigE interface 0/0/0/0:

```
RP/0/0/CPU0:router#(config)# interface TenGigE 0/0/0/0
RP/0/0/CPU0:router#(config-if)# local-proxy-arp
```

proxy-arp

To enable proxy Address Resolution Protocol (ARP) on an interface, enter the **proxy-arp** command in interface configuration mode. To disable proxy ARP on the interface, enter the **no** form of this command.

proxy-arp

no proxy-arp

Syntax Description   This command has no keywords or arguments.

Command Default   Proxy ARP is disabled on all interfaces.

Command Modes   Interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines   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** form of the command removes the specified command from the configuration file and restores the system to its default condition with respect to the command.

Task ID

Task ID	Operations
cef	read, write

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

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

show arp

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

show arp vrf *vrf-name* **[traffic]** [*ip-address* | *hardware-address* | *interface-path-id*] **[traffic] location** *node-id*

Syntax Description

vrf	(Optional) Specifies VPN routing and forwarding (VRF) instance.
vrf-name	(Optional) VRF instance that identifies a VPN.
ip-address	(Optional) The ARP entries you want to display.
location *node-id*	(Optional) Displays the ARP entry for a specific location. The *node-id* argument is entered in the *rack/slot/module* notation.
hardware-address	(Optional) The ARP entries that match the 48-bit MAC address are displayed.
traffic	(Optional) Displays ARP traffic statistics.

interface- path-id	Either a physical interface instance or a virtual interface instance as follows:
	
	 • Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.
	
	  ◦ *rack*: Chassis number of the rack.
	
	  ◦ *slot*: Physical slot number of the modular services card or 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 varies depending on interface type.
	
	 For more information about the syntax for the router, use the question mark (?) online help function.

Command Default   The active RP is the default location.

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	The **vrf** keyword and *vrf-name* argument were added.

Usage Guidelines

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.

For **show arp** *interface-type interface-instance* form, the **location** *node-id* keyword and argument is mandatory for Bundle and VLAN-on-Bundle interfaces to indicate which location the cache entries for the bundle should be displayed. For physical interfaces, specifying the **location** *node-id* keyword and argument is optional since the interface can only exist on one node.

Task ID

Task ID	Operations
cef	read

Examples

The following is sample output from the **show arp** command with no location specified:

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

--------------------------------------------------------------------------------
0/3/CPU0
--------------------------------------------------------------------------------

Address         Age        Hardware Addr    State      Type  Interface
192.4.1.1       -          000c.cfe6.3336  Interface  ARPA 0/3/1/3
192.4.1.2       01:37:50   0000.c004.0102  Dynamic    ARPA 0/3/1/3
2.1.4.2         - 000c.cfe6.33b5  Interface  ARPA 0/3/3/4
2.1.0.2         - 000c.cfe6.33b1  Interface  ARPA 0/3/3/0
2.1.0.1         00:37:56 000a.8b08.857a  Dynamic    ARPA 0/3/3/0
2.1.4.1         01:37:51 000a.8b08.857e  Dynamic    ARPA 0/3/3/4
211.11.1.1      - 000c.cfe6.32fa  Interface  ARPA FastEthernet0/3/0/6
2.1.5.2         - 000c.cfe6.33b6  Interface  ARPA FastEthernet0/3/3/5
2.1.1.2         - 000c.cfe6.33b2  Interface  ARPA FastEthernet0/3/3/1
2.1.1.1         01:37:51 000a.8b08.857b  Dynamic    ARPA FastEthernet0/3/3/1
2.1.5.1         01:37:50 000a.8b08.857f  Dynamic    ARPA FastEthernet0/3/3/5

--------------------------------------------------------------------------------
0/2/CPU0
--------------------------------------------------------------------------------
```

```
Address          Age          Hardware Addr     State       Type   Interface

5.6.9.1 01:11:55   0003.fe4c.0bff   Dynamic     ARPA MgmtEth0/2/CPU0/0

5.6.25.6 01:09:29   000c.cfe6.2000   Dynamic     ARPA MgmtEth0/2/CPU0/0

5.6.5.10 00:39:58   0009.7b49.0bff   Dynamic     ARPA MgmtEth0/2/CPU0/0
```

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

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

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

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

```
RP/0/0/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 2/0/1/2
172.16.7.2 - 0005.5f1d.8100 Interface ARPA 2/0/1/2
```

Related Commands

show arp traffic

To display Address Resolution Protocol (ARP) traffic statistics, enter the **show arp traffic** command in EXEC mode.

show arp traffic [**vrf** *vrf-name*] [*interface-path-id*] [**location** *node-id*]

Syntax Description

vrf	(Optional) Specifies VPN routing and forwarding (VRF) instance.
vrf-name	(Optional) VRF instance that identifies a VPN.
interface- path-id	(Optional) Either a physical interface instance or a virtual interface instance as follows:

• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.

  ◦ *rack*: Chassis number of the rack.

  ◦ *slot*: Physical slot number of the modular services card or 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 varies depending on interface type.

For more information about the syntax for the router, use the question mark (?) online help function.

location *node-id*	(Optional) Displays the ARP entry for a specific location. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default   The active RP is the default location.

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Cisco IOS XR IP Addresses and Services Command Reference for the Cisco XR 12000 Series Router, Release 4.3.x

Usage Guidelines 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.

For **show arp traffic,** *interface-instance*, the **location***node-id* keyword and argument is mandatory for Bundle and VLAN-on-Bundle interfaces to indicate which location the cache entries for the bundle should be displayed. For physical interfaces, specifying the **location** *node-id* keyword and argument is optional since the interface can only exist on one node.

Task ID

Task ID	Operations
cef	read

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

```
RP/0/0/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 traffic** command with the **location** keyword and *node-id* argument:

```
RP/0/0/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, on page 2	Adds a permanent entry to the ARP cache.

Command	Description
clear arp-cache, on page 7	Deletes all dynamic entries from the ARP cache.
show arp, on page 12	Displays ARP statistics.