



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 *IP Addresses and Services Configuration Guide for Cisco CRS Routers*.

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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: <ul style="list-style-type: none"> • 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 2.0	This command was introduced.
	Release 3.3.0	The vrf keyword and <i>vrf-name</i> 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 8](#) 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/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, on page 8	Deletes all dynamic entries from the ARP cache.
show arp, on page 12	Displays the ARP cache.

arp learning

To enable the dynamic learning of ARP entries for a local subnet or all subnets, use the **arp learning** command.

To disable this command, use the **no** prefix or the **disable** option for this command.

arp learning local
no arp learning local
arp learning disable
no arp learning disable

Syntax Description

local	Enables the dynamic learning of ARP entries for local subnets. When arp learning local is configured on an interface or sub-interface, it learns only the ARP entries from ARP packets on the same subnet.
<hr/>	
disable	Disables the dynamic learning of all ARP entries.

Command Default

This command has no keywords or arguments.

Command Modes

Sub-interface configuration mode

```
RP/0/RP0/CPU0:router(config)#interface GigabitEthernet 0/0/0/1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 12.1.3.4 255.255.255.0
RP/0/RP0/CPU0:router(config-if)# arp learning local
RP/0/RP0/CPU0:router(config-if)# no shut
RP/0/RP0/CPU0:router(config-if)# commit
```

```
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 12.1.3.4 255.255.255.0
RP/0/RP0/CPU0:router(config-if)# arp learning disable
RP/0/RP0/CPU0:router(config-if)# commit
```

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	<i>v value</i> Sets the purge delay time in seconds. Range is 1 to 65535.
---------------------------	---

Command Default	Default value is off.
------------------------	-----------------------

Command Modes	Interface configuration
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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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0
RP/0/RP0/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	<i>seconds</i> Indicates the time, in seconds, for which an entry remains in the ARP cache. Range is 30 to 4294967295.
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Command Default	Entries remain in the ARP cache for 14,400 seconds (4 hours).
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Command Modes	Interface configuration
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Command History	Release	Modification
	Release 2.0	This command was introduced.

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/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, on page 8	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 <i>Interface and Hardware Component Command Reference</i> .

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 statistics on the specified interface.
<i>t type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface- path-id</i>	Either a physical interface instance or a virtual interface instance as follows: <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the modular services card or line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. <p>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.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on the interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
location <i>node-id</i>	Clears the ARP entries for a specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The location keyword and <i>node-id</i> argument were made mandatory.

Usage Guidelines

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

Configuration of the **clear arp-cache drop-adjacency** command on a particular location is not recommended. If the command is used on a bundle interface, then drop adjacencies may be deleted in one of the line cards and not on other line cards. This scenario can result in entry mismatch. You can use the **clear arp-cache drop-adjacency interface location all** to remove drop adjacency that is learned for the interface on all the line cards.

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:

```
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:

```
Router# clear arp-cache location 0/1/CPU0
```

Related Commands

Command	Description
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.
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Command Default	Local proxy ARP is disabled on all interfaces.
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Command Modes	Interface configuration
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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:
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- 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/RP0/CPU0:router#(config)# interface TenGigE 0/0/0/0
RP/0/RP0/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 2.0	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/RP0/CPU0:router#(config)# interface MgmtEth 0/RP1/CPU0/0
RP/0/RP0/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.
<i>vrf-name</i>	(Optional) VRF instance that identifies a VPN.
ip-address	(Optional) The ARP entries you want to display.
location <i>node-id</i>	(Optional) Displays the ARP entry for a specific location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
hardware-address	(Optional) The ARP entries that match the 48-bit MAC address are displayed.
traffic	(Optional) Displays ARP traffic statistics.
<i>interface-path-id</i>	Either a physical interface instance or a virtual interface instance as follows: <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the modular services card or line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. <p>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.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on the interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>

Command Default

The active RP is the default location.

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The vrf keyword and <i>vrf-name</i> 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. As this time gets over, the records are refreshed after two unicast requests by ARP to the host IP address. If no response is received from the host, then the entry is cleared from the database.

For **show arp** *interface-type interface-instance* form, the **location** and *node-id* keyword and argument is mandatory for Bundle and VLAN-on-Bundle interfaces. These keywords and arguments indicate the location for which the cache entries for the bundle are to be displayed. For physical interfaces, specifying the **location** and *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:

```
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
211.11.1.1.1    - 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:

```
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:

```
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:

```
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
```

show arp idb

To display the ARP database statistics for an interface, use the **show arp idb** command in EXEC mode.

```
show arp idb interface-name location node-id
```

Syntax Description

interface-name Name of the interface

node-id Location of the interface. LC node for physical interfaces, RP or LC node for virtual interfaces

Command Default

There is no default location, location needs to be provided in the CLI.

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

The **show arp idb** command is useful to verify the IP addresses, Mac address, ARP configuration(s) applied on the interface and the entry statistics.

For **show arp idb** *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.

Task ID

Task ID	Operations
cef	read

Examples

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

```
RP/0/0/CPU0:ios#show arp idb GigabitEthernet 0/0/0/0 location 0/0/CPU0
Mon Jan 30 10:32:15.387 IST
GigabitEthernet0/0/0/0 (0x00000060):
IDB Client: default
IPv4 address 1.1.1.1, Vrf ID 0x60000000
VRF Name default
Dynamic learning: Enable
Dynamic entry timeout: 14400 secs
Drop adjacency timeout: Disable
Purge delay: off
Cache limit: 128000
Incomplete glean count: 1
```

Complete glean count: 0
Complete protocol count: 0
Dropped glean count: 0
Dropped protocol count: 0
IPv4 caps added (state up)
MPLS caps not added
Interface not virtual, not client fwd ref,
Proxy arp not configured, not enabled
Local Proxy arp not configured
Packet IO layer is NetIO
Srg Role : DEFAULT
Idb Flag : 49292
IDB is Complete
IDB Flag Description:
[CAPS | COMPLETE | IPV4_CAPS_CREATED | SPIO_ATTACHED |
SPIO_SUPPORTED]
Idb Flag Ext : 0x0
Idb Oper Progress : NONE
Client Resync Time : Jan 30 10:07:10.736787
Total entries : 9
| Event Name | Time Stamp | S, M
| idb-create | Jan 30 10:07:10.784 | 1, 0
| idb-state-up | Jan 30 10:07:10.784 | 0, 0
| caps-state-update | Jan 30 10:07:10.784 | 0, 1
| address-update | Jan 30 10:07:10.784 | 0, 0
| idb-complete | Jan 30 10:07:10.784 | 0, 0
| idb-entry-create | Jan 30 10:07:10.784 | 0, 0
| idb-caps-add | Jan 30 10:07:10.784 | 0, 0
| idb-caps-add-cb | Jan 30 10:07:10.784 | 0, 0
| idb-last-garp-sent | Jan 30 10:07:11.808 | 0, 0

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: <ul style="list-style-type: none"> • Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash between values is required as part of the notation. <ul style="list-style-type: none"> • <i>rack</i>: Chassis number of the rack. • <i>slot</i>: Physical slot number of the modular services card or line card. • <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. • <i>port</i>: Physical port number of the interface. <p>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.</p> <ul style="list-style-type: none"> • Virtual interface instance. Number range varies depending on the interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
location node-id	(Optional) Displays the ARP entry for a specific location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> 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.

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. These keywords and arguments indicate the location for which the cache entries for the bundle are to be displayed. For physical interfaces, specifying the **location node-id** keyword and argument is optional because 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:

```
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: 5
  Dynamic: 3, Interface: 1, Standby: 0
  Alias: 0, Static: 0, DHCP:0, DropAdj: 1

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:

Related Commands

Command	Description
clear arp-cache, on page 8	Deletes all dynamic entries from the ARP cache.
show arp, on page 12	Displays ARP statistics.