

## Chapter 8

# Configuring Bridged IP

E-series routers support bridged IP (1483) interfaces.

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### Overview

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You can configure a bridged IP interface to manage IP packets that are encapsulated inside an Ethernet frame running over a permanent virtual circuit (PVC).

When you configure a bridged IP interface, it automatically performs proxy Address Resolution Protocol (ARP). You can also configure the router as a relay agent that forwards Dynamic Host Configuration Protocol (DHCP) broadcasts.

### Proxy ARP

Proxy ARP allows your router to respond to ARP requests on behalf of an Ethernet end node.

The router performs proxy ARP for the ARP requests that come in over the bridged IP interface when both of the following conditions are met:

- The IP address in the ARP request matches an entry in the routing table.
- The route is on a different interface than the one on which the router received the ARP request.

If you specify that the bridged IP interface performs unrestricted proxy ARP, it also performs proxy ARP when the route is on the interface that received the ARP request.

In most situations, do not configure the router to perform unrestricted proxy ARP. Do so for special situations, such as when cable modems are used. When an IP client broadcasts the ARP request across the Ethernet wire, the end node with the correct IP address responds to the ARP request and provides the correct MAC address. If the unrestricted proxy ARP feature is enabled, the router response is redundant and might fool the IP client into determining that the destination MAC address within its own subnet is the same as the address of the router.

## **DHCP**

DHCP provides a mechanism through which hosts using TCP/IP can obtain protocol configuration parameters automatically from a DHCP server on the network.

The most important configuration parameter carried by DHCP is the IP address. A host must be initially assigned a specific IP address that is appropriate to the network to which the computer is attached, and that is not assigned to any other host on that network. If you move a host to a new network, you must give it a new IP address.

DHCP also carries other important configuration parameters such as the subnet mask, default router, and Domain Name System (DNS) server.

An IP client contacts a DHCP server for configuration parameters. The DHCP server is typically centrally located and operated by the network administrator. Because a network administrator manages the server, DHCP clients can obtain reliable parameters appropriate to the current network architecture.

For information about DHCP, see *JUNOS Broadband Access Configuration Guide, Chapter 16, DHCP Overview*.

## **Platform Considerations**

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You can configure bridged IP interfaces on the following E-series routers:

- E120 router
- E320 router
- ERX-1440 router
- ERX-1410 router
- ERX-710 router
- ERX-705 router
- ERX-310 router

## Module Requirements

For information about the modules that support bridged IP interfaces on ERX-14xx models, ERX-7xx models, and the ERX-310 router:

- See *ERX Module Guide, Table 1, Module Combinations* for detailed module specifications.
- See *ERX Module Guide, Appendix A, Module Protocol Support* for information about the modules that support bridged IP.

For information about the modules that support bridged IP interfaces on the E120 router and the E320 router:

- See *E120 and E320 Module Guide, Table 1, Modules and IOAs* for detailed module specifications.
- See *E120 and E320 Module Guide, Appendix A, IOA Protocol Support* for information about the modules that support bridged IP.

## Interface Specifiers

The configuration task examples in this chapter use the *slot/port[.subinterface]* format to specify the ATM physical interface on which you want to configure bridged IP. However, the interface specifier format that you use depends on the router that you are using.

For ERX-7xx models, ERX-14xx models, and ERX-310 routers, use the *slot/port[.subinterface]* format. For example, the following command specifies ATM 1483 subinterface 10 on slot 0, port 1 of an ERX-7xx model, ERX-14xx model, or ERX-310 router.

```
host1(config)#interface atm 0/1.10
```

For E120 and E320 routers, use the *slot/adapter/port[.subinterface]* format, which includes an identifier for the bay in which the I/O adapter (IOA) resides. In the software, adapter 0 identifies the right IOA bay (E120 router) and the upper IOA bay (E320 router); adapter 1 identifies the left IOA bay (E120 router) and the lower IOA bay (E320 router). For example, the following command specifies ATM 1483 subinterface 20 on slot 5, adapter 0, port 0 of an E320 router.

```
host1(config)#interface atm 5/0/0.20
```

For more information about supported interface types and specifiers on E-series routers, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.

## References

For more information about bridged IP, consult RFC 2684—Multiprotocol Encapsulation over ATM Adaptation Layer 5 (September 1999). Note that RFC 2684 obsoletes RFC 1483.

## Before You Configure Bridged IP

Before you configure bridged IP on an ATM interface, verify that:

- You have correctly installed a module that supports bridged IP. For information, see *ERX Module Guide, Appendix A, Module Protocol Support* (on ERX-7xx models, ERX-14xx models, and the ERX-310 router) or *E120 and E320 Module Guide, Appendix A, IOA Protocol Support* (on the E120 router or the E320 router).
- Each configured line can transmit data to and receive data from your switch connections.

Table 19 lists the prerequisite tasks for configuring bridged IP and the resources that you can consult to learn how to perform these tasks.

**Table 19: Prerequisite Tasks for Configuring Bridged IP**

To Learn About	See
Preconfiguration and hardware diagnostic procedures	<i>ERX Hardware Guide</i> <i>E120 and E320 Hardware Guide</i>
Configuring T3 and E3 line modules	<i>JUNOS Physical Layer Configuration Guide, Chapter 2, Configuring T3 and E3 Interfaces</i>
Configuring OC3 line modules	<i>JUNOS Physical Layer Configuration Guide, Chapter 3, Configuring Unchannelized OCx/STMx Interfaces</i>

Also have the following information available:

- Interface specifiers for the ATM interfaces on which you want to configure bridged IP  
  
For more information about specifying ATM interfaces and subinterfaces on E-series routers, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.
- Subinterface numbers for each logical interface that you want to create
- Virtual path and channel numbers for each virtual circuit that you want to create
- IP addresses and subnet mask assignments for IP interfaces
- IP address of the DHCP server

## Configuring Bridged IP

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To configure an ATM interface using bridged IP encapsulation:

1. Configure a physical interface.

```
host1(config)#interface atm 0/1
```

2. Configure the subinterface.

```
host1(config-if)#interface atm 0/1.20
```

3. Configure a PVC on the subinterface by specifying the virtual circuit descriptor (VCD), the virtual path identifier (VPI), the virtual channel identifier (VCI), and the encapsulation type.

```
host1(config-if)#atm pvc 10 22 100 aal5snap
```

4. Configure bridged IP encapsulation.

```
host1(config-if)#encapsulation bridge1483
```

5. Assign an IP address and subnet mask to the PVC.

```
host1(config-subif)#ip address 192.168.10.20 255.255.255.0
```



**NOTE:** You can also assign an IP template to the interface or create an unnumbered interface instead of assigning an IP address. For details, see *JUNOS IP, IPv6, and IGP Configuration Guide, Chapter 1, Configuring IP*.

6. (Optional) Use the appropriate **show** commands to verify your configuration.

```
host1#show atm interface 0/1  
host1#show atm vc 0/1 10  
host1#show atm subinterface 0/1.20
```

For more information about using these commands, see *Monitoring ATM* on page 66 in *Chapter 1, Configuring ATM*.

### **atm pvc**

- Use to configure a PVC on an ATM interface.
- The following fields are mandatory:
  - *vcd*—Unique number that identifies a virtual circuit in the range 1–2147483647. The VCD value has no relationship to the VPI and VCI values and has meaning only to the E-series router.
  - *vpi*—8-bit field in the ATM cell header. The VPI value is unique on a single link, not throughout the ATM network, because it has meaning only to the E-series router. The VPI value must match the value on the ATM switch.



**NOTE:** Do not set both the VPI and VCI values to zero.

- *vci*—16-bit field in the ATM cell header. The VCI value is unique on a single link, not throughout the ATM network, because it has meaning only to the router. You cannot set both the VPI and VCI to 0.
- *encapsulation type*:
  - **aal5snap**—Specifies a logical link control (LLC) encapsulated circuit. An LLC/Subnetwork Access Protocol (LLC/SNAP) header precedes the protocol datagram.
  - **aal5muxip**—Specifies a multiplexed circuit used for IP only.
- Example
 

```
host1(config-if)#atm pvc 10 22 100 aal5snap
```
- Use the **no** version to remove the specified PVC.

### ***encapsulation bridge1483***

- Use to configure bridged IP as the encapsulation method on an interface.
- Use the **unrestrictedProxyArp** keyword to allow the router to perform unrestricted processing of ARP requests even if the route is on the same interface on which the request is received. See *Proxy ARP* on page 289 for details.
- Example
 

```
host1(config-if)#encapsulation bridge1483
```
- Use the **no** version to remove bridged IP as the encapsulation method on the interface.

### ***interface atm***

- Use to configure an ATM interface.
- To specify an ATM interface for ERX-7xx models, ERX-14xx models, and ERX-310 routers, use the *slot/port.[subinterface]* format.
  - *slot*—Number of the chassis slot
  - *port*—Port number on the I/O module
  - *subinterface*—Number of the subinterface in the range 1–2147483647
- To specify an ATM interface for E120 and E320 routers, use the *slot/adapter/port[.subinterface]* format.
  - *slot*—Number of the chassis slot
  - *adapter*—Identifier for the IOA within the E320 chassis, either 0 or 1, where:
    - 0 indicates that the IOA is installed in the right IOA bay (E120 router) or the upper IOA bay (E320 router).
    - 1 indicates that the IOA is installed in the left IOA bay (E120 router) or the lower IOA bay (E320 router).
  - *port*—Port number on the IOA
  - *subinterface*—Number of the subinterface in the range 1–2147483647

- For more information, see *Creating a Basic Configuration* in *Chapter 1, Configuring ATM*.
- Examples  
host1(config)#**interface atm 3/1.20**  
host1(config)#**interface atm 5/0/1.20**
- Use the **no** version to remove the ATM subinterface or the logical interface.

