4 Configuring IP

The configuration of IP for the OmniCore routing switch is determined by how the system will be deployed—as a switch or as a routing switch.

- If deployed as either a switch or a routing switch, an IP interfacemust be configured for remote management. Please note that upon initial configuration, all physical ports are located in the default VLAN (VLAN 1).

- If deployed as a routing switch, an IP interface must be defined for each routing interface.

The OmniCore routing switch tightly couples the IP router interfaces to broadcast domains, or VLANs, and can route between VLANs within the unit. Note that the OmniCore routing switch also supports multiple IP interfaces per VLAN (also known as multinets).

The OmniCore routing switch supports addressing by address class and by Classless Inter-Domain Routing (CIDR) as defined by the IETF. Note that the OmniCore routing switch provides support for CIDR addressing in hardware by employing longest prefix match lookup on each port. The CIDR addresses are entered as an address and mask combination. For example, the following CIDR address 192.32.0.0/16 is configured as network 192.32.0.0 mask 255.255.0.0. This style of addressing allows the use of Variable Length Subnet Masks (VLSM) and supernets.

The OmniCore routing switch provides support for the IP precedence field in hardware and can be configured for use in static routes and dynamic routing protocols. It also supports the configuration of ICMP and ICMP Router Discover Protocol (IRDP).

IP Commands

The major IP commands in the OmniCore CLI are listed in the following tables. Other commands are available for fine-tuning your IP configuration. To see a complete list of these commands or for more information regarding the commands used in this chapter, see the *OmniCore CLI Reference Manual.*

IP Global Commands

Command	Default	Description
ip default-gateway	0.0.0.0	Specifies a default gateway router.
ip primary-address	0.0.0.0	Defines a primary IP address which identifies the switch in the network.
ip rdp status	disable	Enables IRDP advertisements for IP networks.
ip route-policy	no default	Create an IP route policy for policy-based routing.
ip route-policy accounting	0 entries	Defines the maximum number of entries in the IP route-policy accounting table.
ip route-policy pri	0	Defines a priority value for a route policy.
ip route-policy qos-mode	normal	Designates a Quality of Service mode for a route policy.
ip route-policy tos	0	Designates a Type of Service value for a route policy.

IP Global Commands (Continued)

ip routing	enable	Enables IP forwarding.
ip static-route	no default	Creates IP static routes.
ip static-route cost	0	Specifies path cost value.
ip static-route priority	default	Specifies routing priority for static route.
ip subnet-broadcast	disable	Activates subnet-directed broadcasts.

IP Interface Commands

Command	Default	Description
vlan ip	no default	Creates an IP interface for a VLAN
vlan ip-routing	all	Designates the IP routing type for a VLAN.
vlan ip broadcast	no default	Sets IP broadcast address for a VLAN
vlan ip encap	etype	Designates IP encapsulation method.
vlan ip rdp adstatus	disable	Enables IRDP advertisements.
vlan ip rdp lifetime	1800 seconds	Defines the length of time IRDP advertisements are kept valid.
vlan ip rdp maxinterval	600 seconds	Defines the maximum interval between IRDP advertisements.
vlan ip rdp mininterval	450 seconds	Defines the minimum interval between IRDP advertisements.
vlan ip rdp multicast	224.0.0.1	Allows a VLAN's IRDP multicast address.
vlan ip rdp preference	0	Defines a VLAN's IRDP preference value.
vlan ip status	enabled	Enables IP forwarding for a VLAN

Configuring IP for Switching

When used as a managed switch, the OmniCore routing switch requires the configuration of an IP interface. This can be associated to the default VLAN. When used as an unmanaged switch, the OmniCore routing switch does not require configuration of an IP interface.

Configuring IP for Routing

Configuring IP for Routing

By default, IP is enabled on the OmniCore routing switch. Configuring IP consists of these tasks:

- Enable IP routing.
- (Optional) Disable subnet-directed broadcasts.
- (Optional) Set the primary address.
- Create an IP VLAN interface.
- Set the IP routing type for a VLAN.
- (Optional) Delete an IP interface from a VLAN.

Follow these steps to configure IP for routing:

1. Enable IP routing by entering the following commands. By default, IP routing is enabled.

```
OmniCore> ip

OmniCore/ip> routing enable
```

2. (Optional) Disable subnet-directed broadcasts to ensure that they will not be passed on to a subnet.

```
OmniCore/ip> subnet-broadcast disable
```

3. (Optional) Set the primary IP address that will identify the OmniCore routing switch in the network. An IP address of 10.0.3.34 is used for this example.

```
OmniCore/ip> primary-address 10.0.3.34

OmniCore/ip> show
Routing Status                        :enable
Subnet Directed Broadcast             :disable
Default Gateway                       :0.0.0.0
Primary IP Address Configured         :10.0.3.34
Primary IP Address in Use             :15.0.6.77
```

4. Create an IP VLAN interface. The OmniCore routing switch ships with all ports located in the default VLAN (VLAN 1). The example shown describes the creation of an IP interface for VLAN 2.

a. Create the VLAN. For this example, VLAN 2 with a tag value of 3 is created.

```
OmniCore> ..

OmniCore> vlan 2 tag 3 create

OmniCore> vlan 2

OmniCore/vlan=2> show
Vlan Id                       :2
Vlan Current State            :enable
Name                          :VLAN-2
Tag                           :3
Priority                      :default
Broadcast Priority            :default
Flood Priority                :default
Oper Status                   :up
IP Routing Type               :all
Port Member List              :
```

Page 4-3

   b. Add ports to the VLAN. For more information about VLAN membership, see Chapter 3, "Configuring VLANs and Priority". Port 2 on slot 5 and port 1 on slot 2, both with default VLAN memberships, are added to VLAN 2 in this example.

```
OmniCore/vlan=2> member 5 2 default add

OmniCore/vlan=2> member 2 1 default add

OmniCore/vlan=2> portlist show
Port Member List                    :5 - 2
                                     2 - 1
```

   c. Attach an IP interface to the VLAN. An IP interface must now be created so that the network will recognize the new VLAN. For this example, an interface with an IP address of 10.0.45.45 and a mask value of 255.255.0.0 is created for this example.

```
OmniCore/vlan=2> ip 10.0.45.45 mask 255.255.0.0 create

OmniCore/vlan=2> ip show
IpAddress        Mask              Broadcast        Admin    Encap   Oper
---------        ----              ---------        -----    -----   ----
10.0.45.45       255.255.0.0       10.0.255.255     enable   ETYPE   up
```

5. Set the IP routing type of the VLAN created in step 4a. This will further limit the routing exposure of packets between VLANs.

```
OmniCore/vlan=2> ip-routing multicast

OmniCore/vlan=2> ip-routing show
IP Routing Type                        :multicast
```

6. (Optional) Delete an IP interface from a VLAN. For this example, IP interface 10.0.18.1 is deleted from VLAN 5.

```
OmniCore/vlan=2> ..

OmniCore> vlan 5

OmniCore/vlan=5> ip 10.18.10.1 delete

OmniCore/vlan=5> ip show
IpAddress        Mask              Broadcast        Admin    Encap    Oper
----------       -----             ----------       ------   ------   ----
10.0.3.34        255.255.0.0       10.0.255.255     enable   ETYPE    up
172.22.12.1      255.255.255.0     172.22.12.255    enable   ETYPE    up
172.22.11.1      255.255.255.0     172.22.11.255    enable   ETYPE    up
```

Creating Static Routes

Static routes are user-defined routes that can be configured to carry a higher priority over routes that are selected by dynamic routing protocols. The following is an example of how to create a static route with an IP address of 11.0.0.0, a subnet mask of 255.0.0.0, a Type of Service (ToS) value of 0, and a gateway address of 172.22.10.2. This example also shows how to assign a priority and cost value for the static route.

To create a static route:

```
OmniCore> ip

OmniCore/ip> static-route 11.0.0.0 255.0.0.0 0 172.22.10.2 create

OmniCore/ip> static-route 11.0.0.0 255.0.0.0 0 172.22.10.2 priority 4

OmniCore/ip> static-route 11.0.0.0 255.0.0.0 0 172.22.10.2 cost 300

OmniCore/ip> static-route show
Network     Mask         Gateway       TOS    Priority   Cost    State
-------     ----         -------       ---    --------   ----    -----
11.0.0.0    255.0.0.0    172.22.10.2   0      4          300     enable
```

Creating Route Policies

Route policies can be created to define maps for use in policy-based routing. In addition to using the traditional method of routing packets based on their destination addresses, a route policy defines the specific parameters that will be used for routing packets, based on the supplied IP address and mask.

The following is an example of how to create a route policy with an IP address of 10.0.45.44, a subnet mask of 255.255.255.0, and a Type of Service (ToS) value of 7. This example also shows how to assign a Quality of Service (QoS) mode, priority value, and an accounting index for the route policy.

To create a route policy:

```
OmniCore> ip

OmniCore/ip> route-policy 10.0.45.44 255.255.255.0 0 create

OmniCore/ip> route-policy 10.0.45.44 255.255.255.0 0

OmniCore/ip/route-policy=10.0.45.44,255.255.255.0,0> qos-mode pri-stamp

OmniCore/ip/route-policy=10.0.45.44,255.255.255.0,0> pri 6

OmniCore/ip/route-policy=10.0.45.44,255.255.255.0,0> accounting 27

OmniCore/ip/route-policy=10.0.45.44,255.255.255.0,0> ..

OmniCore/ip> route-policy show
Network        TOS   QOS          Priority   Index   Sniff   Status
-------        ---   ---          --------   -----   -----   ------
10.0.45.44/24  0     pri-stamp    6          27              enable
```