Chapter 6

Configuring Logical Interface Properties

For a physical interface device to function, you must configure at least one logical interface on that device. For each logical interface, you must specify the protocol family that the interface supports. You can also configure other logical interface properties. These vary by Physical Interface Card (PIC) and encapsulation type, but include the IP address of the interface, and whether the interface supports multicast traffic, data-link connection identifiers (DLCIs), virtual channel identifiers (VCIs) and virtual path identifiers (VPIs), and traffic shaping.

To configure logical interface properties, you include the following statements:

```
unit logical-unit-number {
    accept-source-mac {
        mac-address mac-address {
            policer {
                input cos-policer-name;
                output cos-policer-name;
            }
        }
    }
    accounting-profile name;
    allow-any-vci;
    atm-scheduler-map (map-name | default);
    bandwidth rate;
    cell-bundle-size cells;
    clear-dont-fragment-bit;
    compression {
        rtp {
            f-max-period number;
            queues [ queue-numbers ];
            port {
                minimum port-number;
                maximum port-number;
            }
        }
    }
    description text;
    dial-options {
        l2tp-interface-id name {
            (dedicated | shared);
        }
    }
    disable;
    dlci dlci-identifier;
```

```
drop-timeout milliseconds;
encapsulation type;
epd-threshold cells plp1 cells;
family {
   protocol-family-statements;
}
fragment-threshold bytes;
input-vlan-map {
   pop;
   push;
   swap;
   vlan-id number;
   tag-protocol-id tpid;
}
interleave-fragments;
inverse-arp;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multipoint;
oam-liveness {
   up-count cells;
   down-count cells;
}
oam-period (disable | seconds);
output-vlan-map {
   pop;
   push;
   swap;
   vlan-id number;
   tag-protocol-id tpid;
}
passive-monitor-mode;
peer-unit unit-number;
point-to-point;
service-domain (inside | outside);
shaping {
   (cbr rate | rtvbr peak rate sustained rate burst length |
               vbr peak rate sustained rate burst length);
   queue-length number;
}
short-sequence;
transmit-weight number;
(traps | no-traps);
trunk-bandwidth rate;
trunk-id number;
tunnel {
   backup-destination address;
   destination address;
   key number;
   routing-instance {
      destination routing-instance-name;
   }
   source source-address;
   ttl number;
}
```

```
        vci vpi-identifier.vci-identifier;
        vpi vpi-identifier;
        vlan-id number;
        vlan-tags inner tpid.vlan-id outer tpid.vlan-id;
    }
```

You can include these statements at the following hierarchy levels:

[edit interfaces *interface-name*]

[edit logical-routers *logical-router-name* interfaces *interface-name*]

This chapter describes the configuration of the logical interface properties:

For information about interface-specific logical properties, see “Interface Types” on page 155.

Table 13 lists statements that you can use to configure logical interfaces.

Table 13: Statements for Logical Interface Properties

Statement	Interface Types	Usage Guidelines
accept-source-mac	Gigabit Ethernet intelligent queuing (IQ) interfaces	"Configuring MAC Address Filtering" on page 379
accounting-profile *name*	All	"Configuring Accounting for the Logical Interface" on page 102
allow-any-vci	Asynchronous Transfer Mode (ATM) interfaces	"Configuring ATM Interface Encapsulation" on page 226
atm-scheduler-map (*map-name* | default)	ATM2 IQ interfaces	"Configuring ATM2 IQ VC Tunnel CoS Components" on page 236
backup-destination *address*	Encryption interfaces	"Configuring IPSec Tunnel Redundancy" on page 341
bandwidth *rate*	All interfaces, except multilink and aggregated	"Configuring the Interface Bandwidth" on page 104
cbr *rate*	ATM interfaces	"Defining the ATM Traffic-Shaping Profile" on page 214
cell-bundle-size *cells*	ATM2 IQ interfaces	"Configuring the Layer 2 Circuit Cell-Relay Cell Maximum" on page 208
clear-dont-fragment-bit	Adaptive services interfaces	"Enabling Fragmentation on GRE Tunnels" on page 572
compression	Voice services interfaces	"Configuring Compression" on page 586
description	All	"Adding a Logical Unit Description to the Configuration" on page 100
destination (*address* | *routing-instance-name*)	Encryption generic routing encapsulation (GRE) tunnel, and IP tunnel interfaces	"Configuring an Encryption Interface" on page 338, "Configuring a Unicast Tunnel" on page 570, and "Configuring a Tunnel Interface for Routing Table Lookup" on page 576
dial-options	Adaptive services interfaces on M7i routing platforms	"Configuring L2TP Dialup Properties" on page 170
disable	All	"Disabling a Logical Interface" on page 106
dlci *dlci-identifier*	Point-to-point interfaces with Frame Relay encapsulation	"Configuring Frame Relay DLCIs" on page 407
drop-timeout *milliseconds*	Multilink interfaces	"Configuring a Drop Timeout Period" on page 414
encapsulation *type*	All interfaces, except aggregated SONET/SDH and loopback	"Configuring the Encapsulation on a Logical Interface" on page 105
epd-threshold *cells*	ATM2 IQ interfaces	"Configuring the ATM2 IQ EPD Threshold" on page 222
f-max-period *number*	Voice services interfaces	"Configuring Compression" on page 586
family	All	"Configuring the Protocol Family" on page 110
fragment-threshold *bytes*	Multilink interfaces	"Configuring a Fragmentation Threshold" on page 416
input-vlan-map	Gigabit Ethernet IQ interfaces	"Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags" on page 382

Statement	Interface Types	Usage Guidelines
interleave-fragments	Link services interfaces	"Configuring Link Services Delay-Sensitive Packet Interleaving" on page 417
inverse-arp	Interfaces with ATM and Frame Relay encapsulation	"Configuring Inverse ATM1 or ATM2 ARP" on page 214 and "Configuring Inverse Frame Relay ARP" on page 406
key *number*	GRE tunnel interfaces on Adaptive Services PICs	"Configuring a Key Number on GRE Tunnels" on page 571
l2tp-interface-id *name* (dedicated | shared)	Adaptive services interfaces on M7i routing platforms	"Configuring L2TP Dialup Properties" on page 170
mac-address *mac-address*	Gigabit Ethernet IQ interfaces and Gigabit Ethernet interfaces with small form-factor pluggable transceivers (SFPs) (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i platform)	"Configuring MAC Address Filtering" on page 379
minimum-links *number*	Multilink interfaces	"Configuring Minimum Links" on page 420
mrru *bytes*	Multilink interfaces	"Configuring MRRU" on page 420
multicast-dlci *dlci-identifier*	Point-to-multipoint Frame Relay interfaces	"Configuring a Multicast-Capable Frame Relay Connection" on page 408
multicast-vci *vpi-identifier.vci-identifier*	Point-to-multipoint ATM1 and ATM2 IQ interfaces	"Configuring the ATM OAM F5 Loopback Cell Threshold" on page 225
multipoint	All	"Configuring a Multipoint Connection" on page 101
oam-liveness	ATM1 and ATM2 IQ interfaces	"Configuring the ATM OAM F5 Loopback Cell Threshold" on page 225
oam-period (disable | *seconds*)	ATM1 and ATM2 IQ interfaces	"Defining the ATM OAM F5 Loopback Cell Period" on page 225
output-vlan-map	Gigabit Ethernet IQ interfaces	"Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags" on page 382
passive-monitor-mode	SONET/SDH interfaces	"Enabling Passive Monitoring on SONET/SDH Interfaces" on page 530
peer-unit *unit-number*	Logical tunnel interfaces	"Configuring a Logical Tunnel" on page 574
plp1 *cells*	ATM2 IQ interfaces	"Configuring the ATM2 IQ EPD Threshold" on page 222
point-to-point	All	"Configuring a Point-to-Point Connection" on page 101
policer	Gigabit Ethernet IQ and Gigabit Ethernet PICs with SFPs (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i platform)	"Configuring MAC Address Filtering" on page 379
pop	Gigabit Ethernet IQ interfaces	"Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags" on page 382
port	Voice services interfaces	"Configuring Compression" on page 586
push	Gigabit Ethernet IQ interfaces	"Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags" on page 382
queue-length *number*	ATM1 interfaces	"Configuring the ATM1 Queue Length" on page 221

Statement	Interface Types	Usage Guidelines
queues [*queue-numbers*]	Voice services interfaces	“Configuring Compression” on page 586
routing-instance	GRE tunnel and IP tunnel interfaces	“Configuring a Unicast Tunnel” on page 570 and “Configuring a Tunnel Interface for Routing Table Lookup” on page 576
rtp	Voice services interfaces	“Configuring Compression” on page 586
rtvbr peak *rate* sustained *rate* burst *length*	ATM2 interfaces	“Configuring ATM2 IQ Real-Time VBR” on page 216
service-domain (inside | outside)	Adaptive services interfaces	“Configuring the Interface Address and Domain” on page 161
shaping	ATM1 and ATM2 IQ interfaces	“Defining the ATM Traffic-Shaping Profile” on page 214
short-sequence	Multilink interfaces	“Configuring Sequence Format” on page 421
source *source-address*	Encryption, GRE tunnel, and IP tunnel interfaces	“Configuring an Encryption Interface” on page 338, “Configuring a Unicast Tunnel” on page 570, and “Configuring a Tunnel Interface for Routing Table Lookup” on page 576
swap	Gigabit Ethernet IQ interfaces	“Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags” on page 382
tag-protocol-id *tpid*	Gigabit Ethernet IQ interfaces	“Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags” on page 382
transmit-weight *number*	ATM2 IQ interfaces	“Configuring the ATM2 IQ Transmission Weight” on page 224
(traps | no-traps)	All	“Enabling or Disabling SNMP Notifications on Logical Interfaces” on page 104
trunk-bandwidth *rate*	ATM2 IQ interfaces	“Configuring Layer 2 Circuit Trunk Mode Scheduling” on page 203
trunk-id *number*	ATM2 IQ interfaces	“Configuring Layer 2 Circuit Transport Mode” on page 194
ttl *number*	GRE tunnel and IP tunnel interfaces	“Configuring a Unicast Tunnel” on page 570
tunnel	Encryption, GRE tunnel, and IP tunnel interfaces	“Configuring an Encryption Interface” on page 338, “Configuring a Unicast Tunnel” on page 570, or “Configuring a Tunnel Interface for Routing Table Lookup” on page 576
vbr peak *rate* sustained *rate* burst *length*	ATM interfaces	“Defining the ATM Traffic-Shaping Profile” on page 214
vci *vpi-identifier.vci-identifier*	ATM1 and ATM2 IQ point-to-point interfaces	“Configuring a Point-to-Point ATM1 or ATM2 IQ Connection” on page 212
vpi *vpi-identifier*	ATM1 and ATM2 IQ point-to-point interfaces	“Configuring a Point-to-Point ATM1 or ATM2 IQ Connection” on page 212
vlan-id *number*	Fast Ethernet and Gigabit Ethernet interfaces	“Configuring 802.1Q VLANs” on page 355
vlan-tags inner *tpid.vlan-id* outer *tpid.vlan-id*	Gigabit Ethernet IQ interfaces	“Stacking and Rewriting Gigabit Ethernet IQ VLAN Tags” on page 382

Specifying the Logical Interface Number

Each logical interface must have a logical unit number. The logical unit number corresponds to the logical unit part of the interface name. For more information, see “Interface Naming” on page 29.

Point-to-Point Protocol (PPP), Cisco High-level Data Link Control (HDLC), and Ethernet circuit cross-connect (CCC) encapsulations support only a single logical interface, whose logical unit number must be 0. Frame Relay and ATM encapsulations support multiple logical interfaces, so you can configure one or more logical unit numbers.

You specify the logical unit number by including the unit statement:

```
unit logical-unit-number {
    ...
}
```

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name*]

[edit logical-routers *logical-router-name* interfaces *interface-name*]

The logical unit number can be from 0 through 16384.

Configuring Logical Router Interface Properties

With JUNOS software, you can partition a single physical routing platform into multiple logical devices that perform independent routing tasks. Because logical routers perform a subset of the tasks once handled by the physical routing platform, logical routers offer an effective way to maximize the use of a single router platform.

You can include the following logical router statements:

```
[edit logical-routers logical-router-name]
interfaces interface-name {
    unit logical-unit-number {
        logical-interface-statements;
    }
}
policy-options {
    policy-options-statements;
}
protocols {
    protocols-statements;
}
routing-instances {
    routing-instances-statements;
}
routing-options {
    routing-options-statements;
}
```

For an overview of logical routers, see the *JUNOS Feature Guide*. For detailed information about logical router configuration, see the *JUNOS Routing Protocols Configuration Guide*. For information about configuring peer relationships between logical routers, see "Configuring a Logical Tunnel" on page 574.

To configure interface properties of a logical router, you must include the following statements at the [edit logical-routers *logical-router-name*] hierarchy level:

```
[edit logical-routers logical-router-name]
interfaces interface-name {
    unit logical-unit-number {
        logical-interface-statements;
    }
}
```

Example: Configuring Logical Router Interface Properties

Configure a logical router's interface properties:

```
[edit interfaces t3-0/0/1]
description "Physical interface to be partitioned into multiple logical routers";

[edit logical-routers 1-on-t3-0/0/1]
interfaces t3-0/0/1 {
    unit 1 {
        family inet {
            address 10.0.0.1/32 {
                destination 10.0.0.2;
            }
        }
    }
}
```

Adding a Logical Unit Description to the Configuration

You can include a text description of each logical unit in the configuration file. Any descriptive text you include is displayed in the output of the show interfaces commands, and is also exposed in the ifAlias Management Information Base (MIB) object. It has no impact on the interface's configuration. To add a text description, include the description statement:

```
description text;
```

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

The description can be a single line of text. If the text contains spaces, enclose it in quotation marks.

For information about describing physical interfaces, see "Adding an Interface Description to the Configuration" on page 66.

Configuring a Point-to-Point Connection

By default, all interfaces are assumed to be point-to-point connections. You must ensure that the maximum transmission unit (MTU) sizes on both sides of the connection are the same.

For all interfaces except aggregated Ethernet, Fast Ethernet, and Gigabit Ethernet, you can explicitly configure an interface to be a point-to-point connection by including the point-to-point statement:

```
point-to-point;
```

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

Configuring a Multipoint Connection

By default, all interfaces are assumed to be point-to-point connections. To configure an interface to be a multipoint connection, include the multipoint statement:

```
multipoint;
```

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

Configuring Accounting for the Logical Interface

Juniper Networks routing platforms can collect various kinds of data about traffic passing through the routing platform. You can set up one or more *accounting profiles* that specify some common characteristics of this data, including the following:

The fields used in the accounting records

The number of files that the routing platform retains before discarding, and the number of bytes per file

The period that the system uses to record the data

You configure the profiles and define a unique name for each profile using statements at the [edit accounting-options] hierarchy level. There are two types of accounting profiles: interface profiles and filter profiles. You configure interface profiles by including the interface-profile statement at the [edit accounting-options] hierarchy level. You configure filter profiles by including the filter-profile statement at the [edit accounting-options] hierarchy level. For more information, see the *JUNOS Network Management Configuration Guide*.

You apply filter profiles by including the accounting-profile statement at the [edit firewall filter *filter-name*] and [edit firewall family *family* filter *filter-name*] hierarchy levels. For more information, see the *JUNOS Policy Framework Configuration Guide*.

Applying an Accounting Profile to the Logical Interface

To enable accounting on a logical interface, include the accounting-profile statement:

accounting-profile *name*;

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

You can also reference profiles for the physical interface; for more information, see “Configuring Accounting for the Physical Interface” on page 85.

Example: Applying an Accounting Profile to the Logical Interface

Configure an accounting profile for an interface and apply it to a logical interface:

```
[edit]
accounting-options {
    file if_stats {
        size 4m files 10 transfer-interval 15;
        archive-sites {
            "ftp://login:password@host/path";
        }
    }
    interface-profile if_profile {
        interval 15;
        file if_stats {
            fields {
                input-bytes;
                output-bytes;
                input-packets;
                output-packets;
                input-errors;
                output-errors;
            }
        }
    }
}

[edit interfaces ge-1/0/1 unit 1]
accounting-profile if_profile;
```

To reference profiles by physical interface, see “Applying an Accounting Profile to the Physical Interface” on page 85. For information about configuring a firewall filter accounting profile, see the *JUNOS Policy Framework Configuration Guide*.

Configuring the Interface Bandwidth

By default, the JUNOS software uses the physical interface's speed for the MIB-II object, ifSpeed. You can configure the logical unit to populate the ifSpeed variable by configuring a bandwidth value for the logical interface. The bandwidth statement sets an informational-only parameter; you cannot adjust the actual bandwidth of an interface with this statement.

To configure the bandwidth value for a logical interface, include the bandwidth statement:

bandwidth *rate*;

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

rate is the peak rate, in bps or cps. You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation k (1000), m (1,000,000), or g (1,000,000,000). You can also specify a value in cells per second by entering a decimal number followed by the abbreviation c; values expressed in cells per second are converted to bits per second using the formula 1 cps = 384 bps. The value can be any positive integer. The bandwidth statement is valid for all logical interfaces, except multilink and aggregated interfaces.

Enabling or Disabling SNMP Notifications on Logical Interfaces

By default, Simple Network Management Protocol (SNMP) notifications are sent when the state of an interface or a connection changes. To explicitly enable these notifications on the logical interface, include the traps statement; to disable these notifications on the logical interface, include the no-traps statement:

(traps | no-traps);

You can include these statements at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]

Configuring Interface Encapsulation

PPP encapsulation is the default encapsulation type for physical interfaces. You need not configure encapsulation for any physical interfaces that support PPP encapsulation. If you do not configure encapsulation, PPP is used by default. For physical interfaces that do not support PPP encapsulation, you must configure an encapsulation to use for packets transmitted on the interface. For more information about physical interface encapsulation, see “Configuring the Encapsulation on a Physical Interface” on page 73.

You can optionally configure an encapsulation on a logical interface, which is the encapsulation used within certain packet types.

Configuring the Encapsulation on a Logical Interface

Generally, you configure an interface’s encapsulation at the [edit interfaces *interface-name*] hierarchy level. However, for some encapsulation types, such as Frame Relay, ATM, and Ethernet virtual local area network (VLAN) encapsulations, you can also configure the encapsulation type that is used inside the Frame Relay, ATM, or VLAN circuit itself. To do this, include the encapsulation statement:

```
encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-tcc-vc-mux | atm-cisco-nlpid
| atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux | atm-snap | atm-tcc-snap |
atm-vc-mux | ether-over-atm-llc | ether-vpls-over-atm-llc | ethernet | frame-relay-ccc |
frame-relay-tcc | multilink-frame-relay-end-to-end | multilink-ppp | vlan-ccc | vlan-tcc |
vlan-vpls);
```

You can include this statement at the following hierarchy levels:

```
[edit interfaces interface-name unit logical-unit-number]
```

```
[edit logical-routers logical-router-name interfaces interface-name unit
logical-unit-number]
```

Some of the ATM encapsulations are defined in RFC 2684, *Multiprotocol Encapsulation o ver ATM Adaptation Layer 5*.

The following restrictions apply to logical interface encapsulation:

- With the atm-nlpid, atm-cisco-nlpid, and atm-vc-mux encapsulations, you can configure the inet family only.
- With the CCC circuit encapsulations, you cannot configure a family on the logical interface.
- A logical interface cannot have frame-relay-ccc encapsulation unless the physical device also has frame-relay-ccc encapsulation.
- A logical interface cannot have frame-relay-tcc encapsulation unless the physical device also has frame-relay-tcc encapsulation. In addition, you must assign this logical interface a DLCI from 512 through 1022 and configure it as point-to-point.
- For interfaces that carry IP version 6 (IPv6) traffic, you cannot configure ether-over-atm-llc encapsulation.

When you use ether-over-atm-llc encapsulation, you cannot configure multipoint interfaces.

A logical interface cannot have vlan-ccc or vlan-vpls encapsulation unless the physical device also has vlan-ccc or vlan-vpls encapsulation, respectively. In addition, you must assign this logical interface a VLAN ID from 512 through 1023; if the VLAN ID is 511 or lower, it is subject to the normal destination filter lookups in addition to source address filtering. For more information, see “Configuring VLAN Encapsulation” on page 357.

You can create an ATM cell-relay circuit by configuring an entire ATM physical device or an individual virtual circuit (VC). When you configure an entire device, only cell-relay encapsulation is allowed on the logical interfaces. For more information, see “Configuring an ATM1 Cell-Relay Circuit” on page 228.

For more information about ATM encapsulations, see “Configuring ATM Interface Encapsulation” on page 226.

For more information about Frame Relay encapsulations, see “Configuring Frame Relay Interface Encapsulation” on page 398.

For more information about multilink encapsulations, see “Configuring Logical Interface Encapsulation” on page 415.

Disabling a Logical Interface

You can unconfigure a logical interface, effectively disabling that interface, without removing the logical interface configuration statements from the configuration. To do this, include the disable statement:

```
disable;
```

You can include this statement at the following hierarchy levels:

[edit interfaces *interface-name* unit *logical-unit-number*]

[edit logical-routers *logical-router-name* interfaces *interface-name* unit *logical-unit-number*]