



Junos[®] OS

ISDN Interfaces Configuration Guide

Release
13.1



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Junos® OS ISDN Interfaces Configuration Guide

Release 13.1

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About This Guide

This preface provides the following guidelines for using the *Junos[®] OS ISDN Interfaces Configuration Guide*:

- Junos Documentation and Release Notes on page xiii
- Objectives on page xiv
- Audience on page xiv
- Supported Routing Platforms on page xiv
- Using the Indexes on page xv
- Using the Examples in This Manual on page xv
- Documentation Conventions on page xvi
- Documentation Feedback on page xviii
- Requesting Technical Support on page xviii

Junos Documentation and Release Notes

For a list of related Junos documentation, see
<http://www.juniper.net/techpubs/software/junos/>.

If the information in the latest release notes differs from the information in the documentation, follow the *Junos Release Notes*.

To obtain the most current version of all Juniper Networks[®] technical documentation, see the product documentation page on the Juniper Networks website at
<http://www.juniper.net/techpubs/>.

Juniper Networks supports a technical book program to publish books by Juniper Networks engineers and subject matter experts with book publishers around the world. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration using the Junos operating system (Junos OS) and Juniper Networks devices. In addition, the Juniper Networks Technical Library, published in conjunction with O'Reilly Media, explores improving network security, reliability, and availability using Junos OS configuration techniques. All the books are for sale at technical bookstores and book outlets around the world. The current list can be viewed at <http://www.juniper.net/books>.

Objectives

This guide provides an overview of the network interfaces features of the JUNOS Software and describes how to configure these properties on the routing platform.



NOTE: For additional information about the Junos OS—either corrections to or information that might have been omitted from this guide—see the software release notes at <http://www.juniper.net/>.

Audience

This guide is designed for network administrators who are configuring and monitoring a Juniper Networks M Series, MX Series, T Series, EX Series, or J Series router or switch.

To use this guide, you need a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. You must also be familiar with one or more of the following Internet routing protocols:

- Border Gateway Protocol (BGP)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Intermediate System-to-Intermediate System (IS-IS)
- Internet Control Message Protocol (ICMP) router discovery
- Internet Group Management Protocol (IGMP)
- Multiprotocol Label Switching (MPLS)
- Open Shortest Path First (OSPF)
- Protocol-Independent Multicast (PIM)
- Resource Reservation Protocol (RSVP)
- Routing Information Protocol (RIP)
- Simple Network Management Protocol (SNMP)

Personnel operating the equipment must be trained and competent; must not conduct themselves in a careless, willfully negligent, or hostile manner; and must abide by the instructions provided by the documentation.

Supported Routing Platforms

For the features described in this manual, the JUNOS Software currently supports the following routing platforms:

- J Series
- M Series

- MX Series
- T Series

Using the Indexes

This reference contains two indexes: a complete index that includes topic entries, and an index of statements and commands only.

In the index of statements and commands, an entry refers to a statement summary section only. In the complete index, the entry for a configuration statement or command contains at least two parts:

- The primary entry refers to the statement summary section.
- The secondary entry, *usage guidelines*, refers to the section in a configuration guidelines chapter that describes how to use the statement or command.

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
```

```
unit 0 {  
  family inet {  
    address 10.0.0.1/24;  
  }  
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]  
user@host# load merge /var/tmp/ex-script.conf  
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {  
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]  
user@host# edit system scripts  
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]  
user@host# load merge relative /var/tmp/ex-script-snippet.conf  
load complete
```

For more information about the **load** command, see the CLI User Guide.

Documentation Conventions

Table 1 on page xvii defines notice icons used in this guide.

Table 1: Notice Icons





Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page xvii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: <code>user@host> configure</code>
Fixed-width text like this	Represents output that appears on the terminal screen.	<code>user@host> show chassis alarms</code> <code>No alarms currently active</code>
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	<code>stub <default-metric metric>;</code>

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast <i>(string1 string2 string3)</i>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract,

or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>

PART 1

ISDN Interfaces Configuration Statements Overview

- [ISDN Interfaces Configuration Statements and Hierarchy on page 3](#)

CHAPTER 1

ISDN Interfaces Configuration Statements and Hierarchy

The following network interfaces hierarchy listings show the complete configuration statement hierarchy for the indicated hierarchy levels, listing all possible configuration statements within the indicated hierarchy levels, and showing their level in the configuration hierarchy. When you are configuring the Junos OS, your current hierarchy level is shown in the banner on the line preceding the **user@host#** prompt.

This section contains the following topics:

- [\[edit interfaces\] Hierarchy Level on page 3](#)
- [\[edit logical-systems\] Hierarchy Level on page 19](#)
- [\[edit protocols vrrp\] Hierarchy Level on page 24](#)
- [\[edit system processes\] Hierarchy Level on page 24](#)

[\[edit interfaces\] Hierarchy Level](#)

The statements at the **[edit interfaces *interface-name* unit *logical-unit-number*]** hierarchy level can also be configured at the **[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]** hierarchy level.



NOTE: The accounting-profile statement is an exception to this rule. The accounting-profile statement can be configured at the **[edit interfaces *interface-name* unit *logical-unit-number*]** hierarchy level, but it cannot be configured at the **[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]** hierarchy level.

```
interfaces {
  traceoptions {
    file filename <files number> <match regular-expression> <size size> <world-readable |
      no-world-readable> ;
    flag flag <disable>;
  }
  interface-name {
    accounting-profile name;
    aggregated-ether-options {
```

```
(flow-control | no-flow-control);
lacp {
  (active | passive);
  link-protection {
    disable;
  }
  (revertive | non-revertive);
  periodic interval;
  system-priority priority;
}
link-protection;
link-speed speed;
(loopback | no-loopback);
mc-ae {
  chassis-id chassis-id;
  mc-ae-id mc-ae-id;
  mode (active-active | active-standby);
  redundancy-group group-id;
  status-control (active | standby);
}
minimum-links number;
source-address-filter {
  mac-address;
}
(source-filtering | no-source-filtering);
}
aggregated-sonet-options {
  link-speed speed | mixed;
  minimum-links number;
}
atm-options {
  cell-bundle-size cells;
  ilmi;
  linear-red-profiles profile-name {
    high-plp-max-threshold percent;
    low-plp-max-threshold percent;
    queue-depth cells high-plp-threshold percent low-plp-threshold percent;
  }
}
mpls {
  pop-all-labels {
    required-depth number;
  }
}
pic-type (atm1 | atm2);
plp-to-clp;
promiscuous-mode {
  vpi vpi-identifier;
}
scheduler-maps map-name {
  forwarding-class class-name {
    epd-threshold cells plp1 cells;
    linear-red-profile profile-name;
    priority (high | low);
    transmit-weight (cells number | percent number);
  }
  vc-cos-mode (alternate | strict);
}
```



```

use-null-cw;
vpi vpi-identifier {
  maximum-vcs maximum-vcs;
  oam-liveness {
    down-count cells;
    up-count cells;
  }
  oam-period (seconds | disable);
  shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained rate
      burst length);
    queue-length number;
  }
}
}
clocking clock-source;
data-input (system | interface interface-name);
dce;
serial-options {
  clock-rate rate;
  clocking-mode (dce | internal | loop);
  control-polarity (negative | positive);
  cts-polarity (negative | positive);
  dcd-polarity (negative | positive);
  dce-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
  dsr-polarity (negative | positive);
  dte-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
  }
  dtr-circuit (balanced | unbalanced);
  dtr-polarity (negative | positive);
  encoding (nrz | nrzi);
  indication-polarity (negative | positive);
  line-protocol protocol;
  loopback mode;
  rts-polarity (negative | positive);
  tm-polarity (negative | positive);
  transmit-clock invert;

```

```
}
description text;
dialer-options {
    pool pool-name <priority priority>;
}
disable;
ds0-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    byte-encoding (nx56 | nx64);
    fcs (16 | 32);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback payload;
    start-end-flag (filler | shared);
}
e1-options {
    bert-error-rate rate;
    bert-period seconds;
    fcs (16 | 32);
    framing (g704 | g704-no-crc4 | unframed);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback (local | remote);
    start-end-flag (filler | shared);
    timeslots time-slot-range;
}
e3-options {
    atm-encapsulation (direct | plcp);
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    framing feet;
    compatibility-mode (digital-link | kentrox | larscom) <subrate value>;
    fcs (16 | 32);
    framing (g.751 | g.832);
    idle-cycle-flag (filler | shared);
    invert-data;
    loopback (local | remote);
    (payload-scrambler | no-payload-scrambler);
    start-end-flag (filler | shared);
    (unframed | no-unframed);
}
encapsulation type;
es-options {
    backup-interface es-fpc/pic/port;
}
fastether-options {
    802.3ad aex;
    (flow-control | no-flow-control);
    ignore-l3-incompletes;
    ingress-rate-limit rate;
    (loopback | no-loopback);
    mpls {
        pop-all-labels {
```

```

        required-depth number;
    }
}
source-address-filter {
    mac-address;
}
(source-filtering | no-source-filtering);
}
flexible-vlan-tagging;
gigether-options {
    802.3ad aex;
    (asynchronous-notification | no-asynchronous-notification);
    (auto-negotiation | no-auto-negotiation) remote-fault <local-interface-online |
        local-interface-offline>;
    auto-reconnect seconds;
    (flow-control | no-flow-control);
    ignore-l3-incompletes;
    (loopback | no-loopback);
    mpls {
        pop-all-labels {
            required-depth number;
        }
    }
}
no-auto-mdix;
source-address-filter {
    mac-address;
}
(source-filtering | no-source-filtering);
ethernet-switch-profile {
    (mac-learn-enable | no-mac-learn-enable);
    tag-protocol-id [ tpids ];
    ethernet-policer-profile {
        input-priority-map {
            ieee802.1p premium [ values ];
        }
        output-priority-map {
            classifier {
                premium {
                    forwarding-class class-name {
                        loss-priority (high | low);
                    }
                }
            }
        }
    }
}
policer cos-policer-name {
    aggregate {
        bandwidth-limit bps;
        burst-size-limit bytes;
    }
    premium {
        bandwidth-limit bps;
        burst-size-limit bytes;
    }
}
}
}

```

```

}
(gratuitous-arp-reply | no-gratuitous-arp-reply);
hold-time up milliseconds down milliseconds;
ima-group-options {
    differential-delay number;
    frame-length (32 | 64 | 128 | 256);
    frame-synchronization {
        alpha number;
        beta number;
        gamma number;
    }
    minimum-links number;
    symmetry (symmetrical-config-and-operation |
        symmetrical-config-asymmetrical-operation);
    test-procedure {
        ima-test-start;
        ima-test-stop;
        interface name;
        pattern number;
        period number;
    }
    transmit-clock (common | independent);
    version (1.0 | 1.1);
}
ima-link-options group-id group-id;
interface-set interface-set-name {
    interface ethernet-interface-name {
        (unit unit-number | vlan-tags-outer vlan-tag);
    }
    interface interface-name {
        (unit unit-number);
    }
}
}
isdn-options {
    bchannel-allocation (ascending | descending);
    calling-number number;
    pool pool-name <priority priority>;
    spid1 spid-string;
    spid2 spid-string;
    static-tei-val value;
    switch-type (att5e | etsi | nil | ntdms100 | ntt);
    t310 seconds;
    tei-option (first-call | power-up);
}
keepalives <down-count number> <interval seconds> <up-count number>;
link-mode mode;
lmi {
    lmi-type (ansi | itu | c-lmi);
    n391dte number;
    n392dce number;
    n392dte number;
    n393dce number;
    n393dte number;
    t391dte seconds;
    t392dce seconds;
}

```

```

lsq-failure-options {
    no-termination-request;
    [ trigger-link-failure interface-name ];
}
mac mac-address;
mlfr-uni-nni-bundle-options {
    acknowledge-retries number;
    acknowledge-timer milliseconds;
    action-red-differential-delay (disable-tx | remove-link);
    drop-timeout milliseconds;
    fragment-threshold bytes;
    cisco-interoperability send-lip-remove-link-for-link-reject;
    hello-timer milliseconds;
    link-layer-overhead percent;
    lmi-type (ansi | itu | c-lmi);
    minimum-links number;
    mrru bytes;
    n391 number;
    n392 number;
    n393 number;
    red-differential-delay milliseconds;
    t391 seconds;
    t392 seconds;
    yellow-differential-delay milliseconds;
}
modem-options {
    dialin (console | routable);
    init-command-string initialization-command-string;
}
mtu bytes;
multi-chassis-protection {
    peer a.b.c.d {
        interface interface-name;
    }
}
multiservice-options {
    (core-dump | no-core-dump);
    (syslog | no-syslog);
}
native-vlan-id number;
no-gratuitous-arp-request;
no-keepalives;
no-partition {
    interface-type type;
}
no-vpivci-swapping;
otn-options {
    fec (efec | gfec | none);
    (laser-enable | no-laser-enable);
    (line-loopback | no-line-loopback);
    pass-thru;
    rate (fixed-stuff-bytes | no-fixed-stuff-bytes | pass-thru);
    transmit-payload-type number;
    trigger (oc-lof | oc-lom | oc-los | oc-wavelength-lock | odu-ais | odu-bbe-th | odu-bdi
        | odu-es-th | odu-lck | odu-oci | odu-sd | odu-ses-th | odu-ttim | odu-uas-th |

```

```

    opu-ptm | otu-ais | otu-bbe-th | otu-bdi | otu-es-th | otu-fec-deg | otu-fec-exe |
    otu-iae | otu-sd | otu-ses-th | otu-ttim | otu-uas-th);
tti;
}
optics-options {
    wavelength nm;
    alarm alarm-name {
        (syslog | link-down);
    }
    warning warning-name {
        (syslog | link-down);
    }
}
partition partition-number oc-slice oc-slice-range interface-type type;
timeslots time-slot-range;
passive-monitor-mode;
per-unit-scheduler;
ppp-options {
    chap {
        access-profile name;
        default-chap-secret name;
        local-name name;
        passive;
    }
    compression {
        acfc;
        pfc;
    }
    dynamic-profile profile-name;
    no-termination-request;
    pap {
        access-profile name;
        local-name name;
        local-password password;
        compression;
    }
}
psn-vcip psn-vci-identifier;
psn-vpip psn-vpi-identifier;
receive-bucket {
    overflow (discard | tag);
    rate percentage;
    threshold bytes;
}
redundancy-options {
    priority sp-fpc/pic/port;
    secondary sp-fpc/pic/port;
    hot-standby;
}
satop-options {
    payload-size n;
}
schedulers number;
serial-options {
    clock-rate rate;
    clocking-mode (dce | internal | loop);

```

```

control-polarity (negative | positive);
cts-polarity (negative | positive);
dcd-polarity (negative | positive);
dce-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
}
dsr-polarity (negative | positive);
dte-options {
    control-signal (assert | de-assert | normal);
    cts (ignore | normal | require);
    dcd (ignore | normal | require);
    dsr (ignore | normal | require);
    dtr signal-handling-option;
    ignore-all;
    indication (ignore | normal | require);
    rts (assert | de-assert | normal);
    tm (ignore | normal | require);
}
dtr-circuit (balanced | unbalanced);
dtr-polarity (negative | positive);
encoding (nrz | nrzi);
indication-polarity (negative | positive);
line-protocol protocol;
loopback mode;
rts-polarity (negative | positive);
tm-polarity (negative | positive);
transmit-clock invert;
}
services-options {
    inactivity-timeout seconds;
    open-timeout seconds;
    session-limit {
        maximum number;
        rate new-sessions-per-second;
    }
    syslog {
        host hostname {
            facility-override facility-name;
            log-prefix prefix-number;
            services priority-level;
        }
    }
}
shdsl-options {
    annex (annex-a | annex-b);
    line-rate line-rate;
    loopback (local | remote);
    snr-margin {

```

```
        current margin;  
        snext margin;  
    }  
}  
sonet-options {  
    aggregate asx;  
    aps {  
        advertise-interval milliseconds;  
        annex-b;  
        authentication-key key;  
        fast-aps-switch;  
        force;  
        hold-time milliseconds;  
        lockout;  
        neighbor address;  
        paired-group group-name;  
        preserve-interface;  
        protect-circuit group-name;  
        request;  
        revert-time seconds;  
        switching-mode (bidirectional | unidirectional);  
        working-circuit group-name;  
    }  
    bytes {  
        c2 value;  
        e1-quiet value;  
        f1 value;  
        f2 value;  
        s1 value;  
        z3 value;  
        z4 value;  
    }  
    fcs (16 | 32);  
    loopback (local | remote);  
    mpls {  
        pop-all-labels {  
            required-depth number;  
        }  
    }  
    path-trace trace-string;  
    (payload-scrambler | no-payload-scrambler);  
    rfc-2615;  
    trigger {  
        defect ignore;  
        hold-time up milliseconds down milliseconds;  
    }  
    vtmapping (itu-t | klm);  
    (z0-increment | no-z0-increment);  
}  
speed (10m | 100m | 1g | oc3 | oc12 | oc48);  
stacked-vlan-tagging;  
switch-options {  
    switch-port port-number {  
        (auto-negotiation | no-auto-negotiation);  
        speed (10m | 100m | 1g);  
        link-mode (full-duplex | half-duplex);  
    }  
}
```



```

    }
  }
  t1-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    buildout value;
    byte-encoding (nx56 | nx64);
    crc-major-alarm-threshold (1e-3 | 5e-4 | 1e-4 | 5e-5 | 1e-5);
    crc-minor-alarm-threshold (1e-3 | 5e-4 | 1e-4 | 5e-5 | 1e-5 | 5e-6 | 1e-6);
    fcs (16 | 32);
    framing (esf | sf);
    idle-cycle-flag (flags | ones);
    invert-data;
    line-encoding (ami | b8zs);
    loopback (local | payload | remote);
    remote-loopback-respond;
    start-end-flag (filler | shared);
    timeslots time-slot-range;
  }
  t3-options {
    atm-encapsulation (direct | plcp);
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    buildout feet;
    (cbit-parity | no-cbit-parity);
    compatibility-mode (adtran | digital-link | kentrox | larscom | verilink) <subrate
      value>;
    fcs (16 | 32);
    (feac-loop-respond | no-feac-loop-respond);
    idle-cycle-flag value;
    (long-buildout | no-long-buildout);
    (loop-timing | no-loop-timing);
    loopback (local | payload | remote);
    (mac | no-mac);
    (payload-scrambler | no-payload-scrambler);
    start-end-flag (filler | shared);
  }
  traceoptions {
    flag flag <flag-modifier> <disable>;
  }
  transmit-bucket {
    overflow discard;
    rate percentage;
    threshold bytes;
  }
  (traps | no-traps);
  unidirectional;
  vlan-tagging;
  vlan-vci-tagging;
  unit logical-unit-number {
    accept-source-mac {
      mac-address mac-address {
        policer {
          input cos-policer-name;

```

```

        output cos-policer-name;
    }
}
accounting-profile name;
advisory-options {
    downstream-rate rate;
    upstream-rate rate;
}
allow-any-vci;
atm-scheduler-map (map-name | default);
backup-options {
    interface interface-name;
}
bandwidth rate;
cell-bundle-size cells;
clear-dont-fragment-bit;
compression {
    rtp {
        f-max-period number;
        maximum-contexts number <force>;
        queues [ queue-numbers ];
        port {
            minimum port-number;
            maximum port-number;
        }
    }
}
compression-device interface-name;
copy-tos-to-outer-ip-header;
demux-destination family;
demux-source family;
demux-options {
    underlying-interface interface-name;
}
description text;
interface {
    l2tp-interface-id name;
    (dedicated | shared);
}
dialer-options {
    activation-delay seconds;
    callback;
    callback-wait-period time;
    deactivation-delay seconds;
    dial-string [ dial-string-numbers ];
    idle-timeout seconds;
    incoming-map {
        caller (caller-id | accept-all);
        initial-route-check seconds;
        load-interval seconds;
        load-threshold percent;
        pool pool-name;
        redial-delay time;
        watch-list {
            [ routes ];
        }
    }
}

```

```

    }
  }
}
disable;
disable-mlppp-inner-ppp-pfc;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold cells plp1 cells;
fragment-threshold bytes;
inner-vlan-id-range start start-id end end-id;
input-vlan-map {
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    inner-tag-protocol-id tpid;
    inner-vlan-id number;
    tag-protocol-id tpid;
    vlan-id number;
}
interleave-fragments;
inverse-arp;
layer2-policer {
    input-policer policer-name;
    input-three-color policer-name;
    output-policer policer-name;
    output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
    down-count cells;
    up-count cells;
}
oam-period (seconds | disable);
output-vlan-map {
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    inner-tag-protocol-id tpid;
    inner-vlan-id number;
    tag-protocol-id tpid;
    vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
    chap {
        access-profile name;
    }
}

```

```

    default-chap-secret name;
    local-name name;
    passive;
}
compression {
    acfc;
    pfc;
    pap;
    default-pap-password password;
    local-name name;
    local-password password;
    passive;
}
dynamic-profile profile-name;
lcp-max-conf-req number;
lcp-restart-timer milliseconds;
loopback-clear-timer seconds;
ncp-max-conf-req number;
ncp-restart-timer milliseconds;
}
pppoe-options {
    access-concentrator name;
    auto-reconnect seconds;
    (client | server);
    service-name name;
    underlying-interface interface-name;
}
proxy-arp;
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;
vci-range start start-vci end end-vci;
vpi vpi-identifier;
vlan-id number;
vlan-id-list [vlan-id vlan-id-vlan-id];
vlan-id-range number-number;
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;

```

```

vlan-tags-outer tpid.vlan-id inner-list [vlan-id vlan-id-vlan-id];
family family {
    accounting {
        destination-class-usage;
        source-class-usage {
            direction;
        }
    }
    access-concentrator name;
    address address {
        destination address;
    }
    bundle ml-fpc/pic/port | ls-fpc/pic/port;
    duplicate-protection;
    dynamic-profile profile-name;
    filter {
        group filter-group-number;
        input filter-name;
        input-list {
            [filter-names];
            output filter-name;
        }
        output-list {
            [filter-names];
        }
    }
    ipsec-sa sa-name;
    keep-address-and-control;
    max-sessions number;
    max-sessions-vsa-ignore;
    mtu bytes;
    multicast-only;
    negotiate-address;
    no-redirects;
    policer {
        arp policer-template-name;
        input policer-template-name;
        output policer-template-name;
    }
    primary;
    proxy inet-address address;
    receive-options-packets;
    receive-ttl-exceeded;
    remote (inet-address address | mac-address address);
    rpf-check {
        fail-filter filter-name;
        mode loose;
    }
    sampling {
        direction;
    }
    service {
        input {
            service-set service-set-name <service-filter filter-name>;
            post-service-filter filter-name;
        }
    }
}

```

```

output {
    service-set service-set-names <service-filter filter-name>;
}
}
service-name-table table-name;
short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
targeted-broadcast {
    forward-and-send-to-re;
    forward-only;
}
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name <destination address destination-profile
    profile-name | preferred-source-address address>;
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
    eui-64;
    multipoint-destination address (dlci dlci-identifier | vci vci-identifier);
    multipoint-destination address {
        epd-threshold cells plp1 cells;
        inverse-arp;
        oam-liveness {
            up-count cells;
            down-count cells;
        }
        oam-period (seconds | disable);
        shaping {
            (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained
                rate burst length);
            queue-length number;
        }
        vci vpi-identifier.vci-identifier;
    }
    preferred;
    primary;
    (vrrp-group | vrrp-inet6-group) group-number {
        (accept-data | no-accept-data);
        advertise-interval seconds;
        authentication-type authentication;
        authentication-key key;
        fast-interval milliseconds;
        (preempt | no-preempt) {
            hold-time seconds;
        }
        priority-number number;
        track {
            priority-cost seconds;
            priority-hold-time interface-name {
                bandwidth-threshold bits-per-second {
                    priority;
                }
            }
        }
    }
}

```

```

        interface priority;
        }
        route ip-address/mask routing-instance instance-name priority-cost cost;
        }
        virtual-address [ addresses ];
        }
    }
}

```

- Related Documentation**
- *Junos OS Hierarchy and RFC Reference*
 - Junos® OS Ethernet Interfaces
 - Junos® OS Network Interfaces

[edit logical-systems] Hierarchy Level

The following lists the statements that can be configured at the **[edit logical-systems]** hierarchy level that are also documented in this manual. For more information about logical systems, see the Logical Systems Configuration Guide.

```

logical-systems logical-system-name {
  interfaces interface-name {
    unit logical-unit-number {
      accept-source-mac {
        mac-address mac-address {
          policer {
            input cos-policer-name;
            output cos-policer-name;
          }
        }
      }
    }
  }
  allow-any-vci;
  atm-scheduler-map (map-name | default);
  bandwidth rate;
  backup-options {
    interface interface-name;
  }
  cell-bundle-size cells;
  clear-dont-fragment-bit;
  compression {
    rtp {
      f-max-period number;
      port {
        minimum port-number;
        maximum port-number;
      }
      queues [ queue-numbers ];
    }
  }
  compression-device interface-name;
  description text;
}

```

```

interface {
    l2tp-interface-id name;
    (dedicated | shared);
}
dialer-options {
    activation-delay seconds;
    deactivation-delay seconds;
    dial-string [ dial-string-numbers ];
    idle-timeout seconds;
    initial-route-check seconds;
    load-threshold number;
    pool pool;
    remote-name remote-callers;
    watch-list {
        [ routes ];
    }
}
disable;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation type;
epd-threshold cells plp1 cells;
fragment-threshold bytes;
input-vlan-map {
    inner-tag-protocol-id;
    inner-vlan-id;
    (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
    tag-protocol-id tpid;
    vlan-id number;
}
interleave-fragments;
inverse-arp;
layer2-policer {
    input-policer policer-name;
    input-three-color policer-name;
    output-policer policer-name;
    output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
    up-count cells;
    down-count cells;
}
oam-period (seconds | disable);
output-vlan-map {
    inner-tag-protocol-id;

```



```

inner-vlan-id;
(pop | pop-pop | pop-swap | push | push-push | swap | swap-swap);
tag-protocol-id tpid;
vlan-id number;
}
passive-monitor-mode;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
  chap {
    access-profile name;
    default-chap-secret name;
    local-name name;
    passive;
  }
  compression {
    acfc;
    pfc;
  }
}
dynamic-profile profile-name;
pap {
  default-pap-password password;
  local-name name;
  local-password password;
  passive;
}
}
proxy-arp;
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;
vlan-id number;
vlan-id-list [vlan-id vlan-id-vlan-id]
vlan-tags inner tpid.vlan-id outer tpid.vlan-id;
vlan-tags outer tpid.vlan-id inner-list [vlan-id vlan-id-vlan-id]

```

```

vpi vpi-identifier;
family family {
    accounting {
        destination-class-usage;
        source-class-usage {
            direction;
        }
    }
}
bundle interface-name;
filter {
    group filter-group-number;
    input filter-name;
    input-list {
        [ filter-names ];
    }
    output filter-name;
    output-list {
        [ filter-names ];
    }
}
ipsec-sa sa-name;
keep-address-and-control;
mtu bytes;
multicast-only;
no-redirects;
policer {
    arp policer-template-name;
    input policer-template-name;
    output policer-template-name;
}
primary;
proxy inet-address address;
receive-options-packets;
receive-ttl-exceeded;
remote (inet-address address | mac-address address);
rpf-check <fail-filter filter-name> {
    <mode loose>;
}
sampling {
    direction;
}
service {
    input {
        service-set service-set-name <service-filter filter-name>;
        post-service-filter filter-name;
    }
    output {
        service-set service-set-name <service-filter filter-name>;
    }
}
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
unnumbered-address interface-name destination address destination-profile
    profile-name;
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
}

```

```

broadcast address;
destination address;
destination-profile name;
eui-64;
multipoint-destination address (dlci dlci-identifier | vci vci-identifier);
multipoint-destination address {
    epd-threshold cells plp1 cells;
    inverse-arp;
    oam-liveness {
        up-count cells;
        down-count cells;
    }
    oam-period (seconds | disable);
    shaping {
        (cbr rate | rtvbr peak rate sustained rate burst length | vbr peak rate sustained
            rate burst length);
        queue-length number;
    }
    vci vpi-identifier.vci-identifier;
}
preferred;
primary;
(vrrp-group | vrrp-inet6-group) group-number {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-type authentication;
    authentication-key key;
    fast-interval milliseconds;
    (preempt | no-preempt) {
        hold-time seconds;
    }
    priority-number number;
    track {
        priority-cost seconds;
        priority-hold-time interface-name {
            interface priority;
            bandwidth-threshold bits-per-second {
                priority;
            }
        }
    }
    route ip-address/mask routing-instance instance-name priority-cost cost;
}
}
virtual-address [ addresses ];
}
}
}
}
}

```

Related Documentation

- [Junos OS Hierarchy and RFC Reference](#)
- [Junos® OS Ethernet Interfaces](#)
- [Junos® OS Network Interfaces](#)

[edit protocols vrrp] Hierarchy Level

The following statement hierarchy can also be included at the [edit logical-systems *logical-system-name*] hierarchy level.

```
protocols {
  vrrp {
    failover-delay milliseconds;
    global-advertisements-threshold advertisement-value;
    skew-timer-disable;
    startup-silent-period seconds;
    traceoptions {
      file <filename> <files number> <match regular-expression> <microsecond-stamp>
        <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
    version-3;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies
- [edit protocols] Hierarchy Level
- *Junos OS Hierarchy and RFC Reference*
- Junos® OS Ethernet Interfaces
- Junos® OS Network Interfaces

[edit system processes] Hierarchy Level

```
dialer-services {
  disable;
}
isdn-signaling {
  disable;
  reject-incoming;
}
```

PART 2

Configuring ISDN Interfaces

- [Configuring ISDN Interfaces on page 27](#)

CHAPTER 2

Configuring ISDN Interfaces

- [ISDN Interfaces Overview on page 27](#)
- [Configuring ISDN Services Physical and Logical Interface Properties on page 28](#)
- [Configuring ISDN Physical Interface Properties on page 29](#)
- [Configuring an ISDN Interface to Screen Incoming Calls on page 31](#)
- [Configuring ISDN Logical Interface Properties on page 31](#)
- [Disabling ISDN Processes on page 47](#)

ISDN Interfaces Overview

ISDN is a set of standards for digital transmission over different media created by the Consultative Committee for International Telegraphy and Telephony (CCITT) and the International Telecommunication Union (ITU). ISDN is a dial-on-demand service that provides fast call setup, low latency, and the ability to carry high-quality voice, data, and video transmissions. ISDN is also a circuit-switched service that can be used on both multipoint and point-to-point connections.

You configure two types of interfaces for ISDN service: a physical interface and a logical interface called the *dialer interface*.

Four types of Physical Interface Modules (PIMs) provide ISDN connectivity on J Series Services Routers:

- 1-port S/T interface supporting ITU-T I.430, ETSI TS 101080, and GR-1089-Core Type III
- 1-port U interface supporting ANSI T.601 and GR-1089-Core
- 4-port S/T interface supporting ITU-T I.430, ETSI TS 101080, and GR-1089-Core Type III as a field-replaceable unit (FRU)
- 4-port U interface supporting ANSI T.601 and GR-1089-Core

For information about installing hardware, see the *J Series Services Routers Hardware Guide*.

For information about installing ISDN service over an ISDN line, contact your telecommunications service provider.

Configuring ISDN Services Physical and Logical Interface Properties

To configure ISDN services physical interface properties, include the **isdn-options** statement at the **[edit interfaces br-pim/O/port]** hierarchy level:

```
[edit interfaces br-pim/O/port]
isdn-options {
  calling-number number;
  incoming-called-number number <reject>;
  spid1 spid-string;
  spid2 spid-string;
  static-tei-val value;
  switch-type (att5e | etsi | nil | ntdms100 | ntt);
  t310 seconds;
  tei-option (first-call | power-up);
}
dialer-options {
  pool pool-name <priority priority>;
}
```

To configure ISDN services logical interface properties, include the following statements:

```
[edit interfaces dln unit logical-unit-number]
dialer-options {
  activation-delay seconds;
  callback;
  callback-wait-period time;
  deactivation-delay seconds;
  dial-string dial-string-numbers;
  idle-timeout seconds;
  incoming-map {
    caller (caller-id| accept-all);
    initial-route-check seconds;
    load-interval seconds;
    load-threshold percent;
    pool pool-name;
    redial-delay time;
    watch-list {
      [ routes ];
    }
  }
  encapsulation [
    (cisco-hdlc | multilink-ppp | ppp);
  ]
}
```

To configure a primary interface to use an ISDN logical interface as a backup or “failover” interface when the primary connection experiences interruptions in Internet connectivity, include the **backup-options** statement to specify the ISDN interface at the **[edit interfaces interface-name unit logical-unit-number]** hierarchy level:

```
[edit interfaces interface-name unit logical-unit-number]
backup-options {
  interface dln.0;
}
```


You can include these statements at the following hierarchy levels:

- **[edit interfaces]**
- **[edit logical-systems *logical-system-name* interfaces]**

To configure the Services Router to reject incoming ISDN calls (supported when dial-in is configured), include the **reject-incoming** statement at the **[edit system processes isdn-signaling]** hierarchy level:

```
[edit system processes isdn-signaling]
reject-incoming;
}
```

To disable ISDN, include the **disable** statement at the **[edit system processes isdn-signaling]** hierarchy level:

```
[edit system processes isdn-signaling]
disable;
}
```

To disable the dial-out on demand process, include the **disable** statement at the **[edit system processes dialer-services]** hierarchy level:

```
[edit system processes dialer-services]
disable;
}
```

Configuring ISDN Physical Interface Properties

You specify the physical ISDN interface in the form **br-pim/0/port.pim**. **pim** is the slot in which the PIM is installed. The second number is always 0. **port** is the configured port number.

You specify the B-channel in the form **bc-pim/0/port:n**. **n** is the B-channel ID and can be 1 or 2. You specify the D-channel in the form **dc-pim/0/port:0**.



NOTE: The B- and D-channel interfaces do not have any configurable parameters. However, when interface statistics are displayed, B- and D-channel interfaces have statistical values.

To enable ISDN interfaces installed on your Services Router to work properly, you must configure the interface properties. To configure physical interface properties, include the **isdn-options** statement at the **[edit interfaces br-pim/0/port]** hierarchy level:

```
[edit interfaces br-pim/0/port]
isdn-options {
  calling-number number;
  incoming-called-number number <reject>;
  spid1 spid-string;
  spid2 spid-string;
  static-tei-val value;
  switch-type (att5e | etsi | nil | ntdms100 | ntt);
  t310 seconds;
```

```

    tei-option (first-call | power-up);
  }
  dialer-options {
    pool pool-name <priority priority>;
  }

```

You can configure the following ISDN options:

- **calling-number**—The calling number included in outgoing calls.
- **incoming-called-number**—Screening of incoming calls. If the incoming number of the incoming call is configured, the call is accepted. If the reject option is specified with the number, the call is rejected. If no numbers are configured, all calls are accepted. See [“Configuring an ISDN Interface to Screen Incoming Calls” on page 31](#).
- **pool**—The dial pool for logical and physical ISDN interfaces. The dial pool allows logical (dialer) and physical (**br-pim/0/port**) interfaces to be bound together dynamically on a per-call basis. On a dialer interface, pool directs the dialer interface to a dial pool. On a **br-pim/0/port** interface, pool defines the pool to which the interface belongs. Specify a priority value from 0 (lowest) to 255 (highest) for the interface.
- **spid1**—The Service Profile Identifier (SPID). **spid-string** is a numeric value. If your service provider requires SPIDs, you cannot place calls until the interface sends a valid, assigned SPID to the service provider when accessing the ISDN connection. A single SPID must be configured as **spid1**.
- **spid2**—A second SPID, used for DMS-100 and NI1switch types.
- **static-tei-val**—A static Terminal Endpoint Identifier (TEI) value. The TEI value represents any ISDN-capable device attached to an ISDN network that is the terminal endpoint. TEIs are used to distinguish between different devices using the same ISDN links. Specify a value from 0 through 63. You cannot configure a TEI value with multiple SPIDs—dynamic TEI assignment is required.



NOTE: TEI assignment is usually done dynamically instead of statically using the TEI management protocol. When the TEI management protocol is used, values 64-126 are assigned to terminal endpoints. TEI value 127 is used for group assignment.

- **switch-type**—The ISDN switch type. The following switches are compatible:
 - **att5e**—AT&T 5ESS
 - **etsi**—NET3 for United Kingdom and Europe
 - **ni1**—National ISDN-1
 - **ntdms100**—Northern Telecom DMS-100
 - **ntt**—NTT Group switch for Japan
- **tei-option**—When the Terminal Endpoint Identifier (TEI) negotiates with the ISDN provider. Specify first-call (activation does not occur until the call setup is sent) or

power-up (activation occurs when the Services Router is powered on). The default value is power-up.

- **t310**—Q.931-specific timer for T310, in seconds. Specify the number of seconds from 1 through 65536. The default value is 10 seconds.

Configuring an ISDN Interface to Screen Incoming Calls

By default, an ISDN interface is configured to accept all incoming calls. If multiple devices are connected to the same ISDN line, you can configure an ISDN interface to screen incoming calls based on the incoming called number.

You can specify the incoming called numbers that an ISDN interface accepts. You can use the **reject** option to specify a number that the ISDN interface can ignore. The **reject** option is useful when an incoming called number is specified on one device connected to an ISDN line, and you want the incoming called number rejected on a second ISDN device connected to the same ISDN line. For example, if the first ISDN device has the called number 4085321901, you can configure the called number 4085321901 with the **reject** option on the second ISDN device.

When an incoming ISDN call is received, the Services Router matches the incoming called number against the called numbers configured on its ISDN interfaces. If an exact match is not found, or if the called number is configured with the **reject** option, the incoming call is ignored. Each ISDN interface accepts only the calls whose called number are configured on it.

To specify that an incoming called number be rejected by the interface, include the **incoming-called-number** statement with the **reject** option at the **[edit interfaces br-pim/0/port isdn-options]** hierarchy level:

```
[edit interfaces br-pim/0/port isdn-options]
incoming-called-number number reject;
```

You can configure up to 30 incoming called numbers.

Configuring ISDN Logical Interface Properties

You configure ISDN services interface properties at the logical unit level.

The dialer interface, **dl*n***, is a logical interface for configuring dialing properties for a backup ISDN connection. The interface can be configured in two modes:

- Multilink mode using **multilink-ppp** encapsulation. This mode is used when the router supports B-channel bundling (two B-channels connected to provide a 128-Kbps connection) and runs Multilink Point-to-Point Protocol (MLPPP). When the dialer interface (**dl*n***) is in multilink mode, the value of *n* is from 0 through 149. However, you can only configure one dialer interface with **multilink-ppp** encapsulation. For example, you cannot have both **dl1** and **dl2** as multilink dialers simultaneously. If you need to have multiple multilink dialers, then the values should be **dl*n*.1**, **dl*n*.2**, and so forth.

- Normal mode using **ppp** or **cisco-hdlc** encapsulation. This mode is used when the router is using one B-channel. When the dialer interface (**dl*n***) is in normal mode, the value of **n** is always is from 0 through 149.



NOTE: Ensure that the same IP subnet address is not configured on different dialer interfaces. Configuring the same IP subnet address on different dialer interfaces can result in inconsistency in the route and packet loss. Packets may be routed through any of the dialer interfaces that have the same IP subnet address, instead of being routed through the dialer interface to which the ISDN call is connected.

You can configure the following ISDN services logical interface properties:

- [Configuring an ISDN Dialer Interface as a Backup Interface on page 34](#)
- [Applying the Dial-on-Demand Dialer Filter to the Dialer Interfaces on page 36](#)
- [Configuring Bandwidth on Demand on page 37](#)
- [Configuring Dial-In and Callback on page 40](#)
- [Configuring Dialer Watch on page 42](#)

The dialer interface cannot be configured:

- As a backup interface and as a dialer filter simultaneously.
- As a backup interface and as a dialer watch simultaneously.
- As a dialer watch interface and as a dialer filter simultaneously.
- As a backup interface for more than one primary interface.

For specific ISDN configuration information for dial-on-demand routing (DDR) and adding Open Shortest Path First (OSPF) demand circuits to a Services Router, see the Junos OS Routing Protocols Configuration Guide.

For general information about logical unit properties, see [Configuring Logical Interface Properties](#). For general information about **family inet** properties, see [Protocol Family Configuration and Interface Address Statements](#).

To configure logical interface properties, include the **encapsulation** statement at the **[edit interfaces dl*n*]** hierarchy level and the **dialer-options** statement at the **[edit interfaces dl*n* unit *logical-unit-number*]** hierarchy level:

```
[edit interfaces dln]
encapsulation (cisco-hdlc | multilink-ppp | ppp);
[edit interfaces dln unit logical-unit-number]
dialer-options {
  activation-delay seconds;
  callback;
  callback-wait-period time;
  deactivation-delay seconds;
  dial-string dial-string-numbers;
  idle-timeout seconds;
```

```

incoming-map {
  caller (caller-id | accept-all);
  initial-route-check seconds;
  load-interval seconds;
  load-threshold percent;
  pool pool-name;
  redial-delay time;
  watch-list {
    [ routes ];
  }
}

```

You can configure the following options:

- **activation-delay**—ISDN activation delay, in seconds. Specify a number from 1 through 4294967295.
- **callback**—Configure the dialer to terminate the incoming call and call back the originator after the callback wait period.
- **callback-wait-period**—For interfaces configured for ISDN with callback, specify the amount of time the dialer waits before calling back the caller. The default is 5 seconds.
- **caller**—Specify the dialer to accept a specified caller number or accept all incoming calls.
- **deactivation-delay**—ISDN deactivation delay, in seconds. Specify from 1 through 4294967295.
- **encapsulation**—Logical link-layer encapsulation type. For normal mode, specify **cisco-hdlc** for Cisco-compatible High-Level Data Link control (HDLC) or **ppp** for Point-to-Point Protocol. For multilink mode, specify **multilink-ppp**.
- **dial-string**—Phone number to be dialed. Do not include hyphens in number.
- **idle-timeout**—Number of seconds the link is idle before losing connectivity. The default is 120 seconds.
- **incoming-map**—Specify the dialer to accept incoming calls. This statement is required at one end of the ISDN connection.



CAUTION: Changing the caller incoming map when a call is connected can create inconsistencies in the route and prevent traffic on a subnet from being transmitted. This is seen when two dialer interfaces are configured and the association of the caller incoming-map from one interface to the other is changed when a call is connected on one of the interfaces. The cause of the inconsistency is that dialer interfaces are pseudo interfaces that are always up, even if not actually connected.

- **initial-route-check**—Allows the router to check whether the primary route is up after the initial startup of the router is complete and the timer expires.

- **load-interval**—Interval used to calculate the average load on the network. By default, the average interface load is calculated every 60 seconds. You can specify an interval from 20 through 180 seconds, configurable in intervals of 10 seconds. For more information about the load interval, see [“Configuring Bandwidth on Demand” on page 37](#).
- **load-threshold**—Bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the bandwidth reaches the threshold value you set. Specify a percentage between 0 and 100. When the value is set to 0, all available channels are dialed. The default value is 100.
- **pool**—For logical and physical ISDN interfaces, specify the dial pool. The dial pool allows logical (dialer) and physical (**br-pim/0/port**) interfaces to be bound together dynamically on a per-call basis. On a dialer interface, **pool** directs the dialer interface which dial pool to use. On a **br-pim/0/port** interface, **pool** defines the pool to which the interface belongs.
- **redial-delay**—Specify the delay (in seconds) between two successive calls made by the dialer (for dialout). The default is 3 seconds.
- **watch-list**—IP prefix of one or more routes. The primary route is considered up if there is at least one valid route for any of the addresses in the watch list to an interface other than the backup interface.

Changing the caller incoming map when a call is connected can create inconsistencies in the route and prevent traffic on a subnet from being transmitted. This is seen when two dialer interfaces are configured and the association of the caller incoming-map from one interface to the other is changed when a call is connected on one of the interfaces.

The cause of the inconsistency is that dialer interfaces are pseudo interfaces that are always up, even if not actually connected.

Configuring an ISDN Dialer Interface as a Backup Interface

Configuring the ISDN interface as a backup interface ensures continuous network connectivity. The Services Router can be configured to fail over to the ISDN interface if the primary connection experiences interruptions in Internet connectivity.

To configure an ISDN interface as the backup interface, include the **backup-options** statement at the **[edit interfaces *interface-name* unit *logical-unit-number*]** hierarchy level:

```
[edit interfaces interface-name unit logical-unit-number]  
  backup-options {  
    interface dln.0;  
  }
```

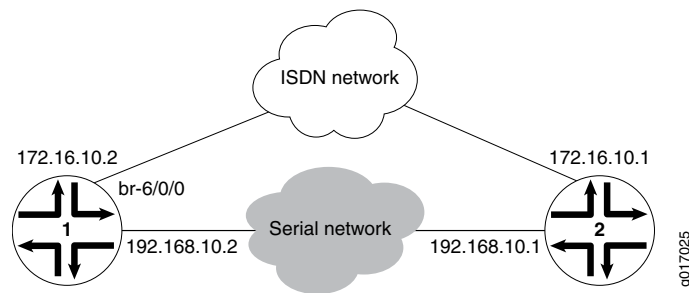
interface-name is the primary interface. The backup interface is specified as ***dln***.

Example: Configuring an ISDN Interface as the Backup Interface

The following example illustrates a backup configuration using a primary serial interface, two dialer interfaces, and a physical ISDN interface.

See [Figure 1 on page 35](#) for the topology used for this example.

Figure 1: ISDN Backup Topology



Configure dialer interface **d10** as the backup interface on the primary serial interface **t1-4/0/1**:

**Configuration on the
Primary Serial
Interface**

```
[edit interfaces]
t1-4/0/1 {
  encapsulation ppp;
  unit 0 {
    backup-options {
      interface d10.0;
    }
    family inet {
      address 192.168.10.2/30;
    }
  }
}
```

**Configuration on the
Dialer Interface**

```
[edit interfaces]
d10 {
  encapsulation ppp;
  unit 0 {
    dialer-options {
      pool 10;
      dial-string 5552222;
      activation-delay 10;
      deactivation-delay 10;
      incoming-map
        caller 5552222 accept-all
    }
    family inet {
      address 172.16.10.2/32 {
        destination 172.16.10.1;
      }
    }
  }
}
```

**Configuration on the
Physical ISDN
Interface**

```
[edit interfaces]
br-6/0/0 {
  isdn-options {
    calling-number 5558888;
    spid1 51255511110101 5551111;
    spid2 51255511120101 5551112;
    switch-type nil;
  }
}
```

```

    t310 70;
  }
  dialer-options {
    pool 10 priority 3;
    pool 2 priority 25;
  }
}

```

Applying the Dial-on-Demand Dialer Filter to the Dialer Interfaces

Dial-on-demand routing (DDR) links two sites over a public network and provides bandwidth. An ISDN connection allows an ISDN line to be activated only when there is network traffic configured as an “interesting” packet. An interesting packet is defined using the firewall filter feature of the Services Router.

To configure DDR, you configure the dialer interface as a passive static route with a lower priority than dynamic routes. If the dynamic route is lost, and a packet destined for that IP address is received, the dialer interface initiates an ISDN connection and sends the packet over it. When no new packets are sent to the destination, the dialer interface initiates an inactivity timer. The ISDN connection is terminated when the timer expires.

To configure dial-on-demand connectivity, perform the following steps:

1. Define the dialer filter.
2. Configure the firewall rule.
3. Apply the dialer filter to the dialer interface.

To define the filter, include the **dialer-filter interesting-traffic** statement at the **[edit firewall family inet]** hierarchy level.

To configure the firewall rule, include the **term** and **from** statements at the **[edit firewall family inet dialer-filter *filter-name*]** hierarchy level.

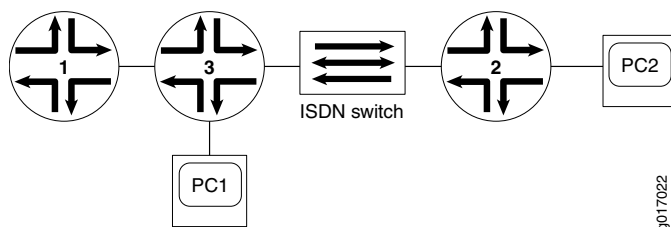
To apply the filter to the dialer interface, include the **filter dialer** statement at the **[edit interfaces *dln* unit *logical-unit-number* family *family*]** hierarchy level.

Example: Applying the Dialer Filter

The following example illustrates a dialer filter configuration configured at the **[edit firewall family inet]** hierarchy level and applied to a physical interface and a dialer interface.

See [Figure 2 on page 36](#) for the topology used for this example.

Figure 2: Dialer Filter Topology



Configuration for the Dialer Filter

```
[edit firewall family inet]
dialer-filter interesting-traffic {
  term 1 {
    from {
      destination-address {
        10.2.1.1/30;
      }
    }
    then note;
  }
}
```

Configuration on the Dialer Interface

```
[edit interfaces]
dl0 {
  encapsulation ppp;
  unit 0 {
    dialer-options {
      pool 1;
      dial-string 350100;
    }
  }
  family inet {
    filter {
      dialer interesting-traffic;
    }
    address 50.2.0.1/24;
  }
}
```

Configuring Bandwidth on Demand

You can define a bandwidth threshold for network traffic on the Services Router using the dialer interface and ISDN interfaces. Initially, only one ISDN link is active and all packets are sent through this interface. When a predefined bandwidth threshold is reached on this interface, the dialer interface activates another ISDN link and initiates a data connection.

To configure bandwidth on demand, perform the steps in the following sections to configure the dialer interface and the physical ISDN interfaces:

- [Configuring the Dialer Interface on page 37](#)
- [Configuring the ISDN Interface on page 38](#)
- [Example: Configuring Bandwidth on Demand on page 39](#)

Configuring the Dialer Interface

To configure the dialer interface for bandwidth on demand, include the **encapsulation multilink-ppp** statement at the **[edit interfaces dl*n*]** hierarchy level:

```
[edit interfaces]
dln {
  encapsulation multilink-ppp;
}
```

To configure dialer options, include the **dialer-options** statement at the **[edit interfaces dln unit *logical-unit-number*]** hierarchy level:

```
[edit interfaces dln unit logical-unit-number]  
dialer-options {  
  dial-string dial-string-numbers;  
  load-interval seconds;  
  load-threshold percent;  
  pool pool-name;  
}
```

To configure unit properties, include the **unit *logical-unit-number*** statement at the **[edit interfaces dln]** hierarchy level:

```
[edit interfaces dln unit logical-unit-number]  
family family {  
  mtu bytes;  
  negotiate-address;  
  filter {  
    filter-name;  
    fragment-threshold bytes;  
    mrru bytes;  
    ppp-options {  
      chap {  
        access-profile name;  
      }  
    }  
  }  
}
```

You can configure the following unit properties:

- **family**—Protocol family information for the logical interface. For ***family***, specify **inet** (for Internet Protocol version 4 [IPv4]) suite.
- **filter**—Dialer filter name. The dialer filter applied here is configured at the **[edit firewall family inet]** hierarchy level and also applied to the physical ISDN interface.
- **fragment-threshold**—Maximum size, in bytes, for multilink packet fragments. Any nonzero value must be a multiple of 64 bytes. The value can be between **128** and **16320**. The default is **0** bytes (no fragmentation).
- **mrru**—Maximum received reconstructed unit (MRRU), in bytes. The value can be between **1500** and **4500**. The default is **1500** bytes.
- **negotiate-address**—For interfaces with Point-to-Point Protocol (PPP) encapsulation, enable the interface to be assigned an IP address by the remote end.

Configuring the ISDN Interface

To configure the ISDN interface for bandwidth on demand, include the **pool** statement at the **[edit interfaces br-pim/O/port dialer-options]** hierarchy level:

```
[edit interfaces br-pim/O/port]
```

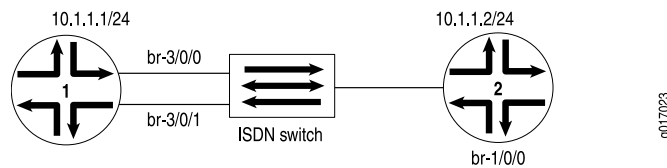
```
dialer-options {
  pool pool-name;
}
```

Each ISDN interface must use the same dialer pool name to participate in the bandwidth-on-demand configuration.

Example: Configuring Bandwidth on Demand

Figure 3 on page 39 illustrates a bandwidth-on-demand configuration using multiple physical ISDN interfaces.

Figure 3: Bandwidth-on-Demand Topology



Configuration for the Dialer Interface

```
[edit interfaces]
dlo {
  encapsulation multilink-ppp;
  unit 0 {
    dialer-options {
      pool 10;
      dial-string 5552222; #Phone number to be dialed
      load-threshold 95;#Dial more ISDN if load exceeds 95% of
        #current capacity
    }
    fragment-threshold 1024; #Allowed only when dialer is in multilink mode
    mrru 1500; #Allowed only when dialer is in multilink mode
    encapsulation multilink-ppp;
    rtp {
      f-max-period 100;
      queues q3;
    }
  }
  family inet {
    negotiate-address;
  }
}
```

Configuration for the First Physical ISDN Interface

```
[edit interfaces]
br-3/0/0 {
  isdn-options {
    switch-type nil;
  }
  dialer-options {
    pool 10;
  }
}
```

Configuration for the Second Physical ISDN Interface

```
[edit interfaces]
br-3/0/1 {
  isdn-options {
```

```
        switch-type nil;
    }
    dialer-options {
        pool dialer-pool10;
    }
}
```

Configuring Dial-In and Callback

You can configure dial-in on the dialer interface to permit incoming calls. Using dial-in, all incoming calls on a BRI interface are mapped to a dialer interface based on a caller ID. The incoming call's caller ID is compared against all caller IDs configured on all dialers to find the valid match. Multiple caller IDs can be configured on a dialer interface. The same caller IDs cannot be configured on different dialers.

Instead of accepting incoming calls, you can configure the dialer interface to call back the caller. When callback is configured, the call is rejected, and after a brief delay the caller is called back using the dial-string configured on the dialer interface. Multiple dial-strings cannot be configured on a dialer when callback is configured.

To configure dial-in or callback, perform the steps in the following sections to configure the dialer interface and the physical ISDN interfaces:

- [Configuring Dial-In on page 40](#)
- [Disabling Dial-In on page 41](#)
- [Configuring Callback on page 41](#)
- [Example: Configuring Dial-In and Callback on page 41](#)

Configuring Dial-In

To configure the dialer interface for dial-in operation, include the **incoming-map** statement with options at the **[edit interfaces dln unit *logical-unit-number* dialer-options]** hierarchy level:

```
[edit interfaces dln unit logical-unit-number]
dialer-options {
    incoming-map {
        caller (caller-id | accept-all);
    }
}
}
```



NOTE: The **incoming-map** statement is mandatory for the router to accept any incoming ISDN calls.

Include the option **accept-all** to accept all incoming calls. You can configure the **accept-all** option for only one of the dialer interfaces associated with an ISDN physical interface. The dialer interface with the **accept-all** option configured will be used only if the incoming call's caller ID does not match against the caller IDs configured on other dialer interfaces.

Include the **caller caller-id** statement to configure the dialer interface to accept calls from a specific caller ID. You can configure a maximum of 15 caller IDs per dialer interface.

The same caller ID cannot be configured on different dialer interfaces. However, you can configure a subset of the caller ID configured on another dialer interface. For example, you can configure the caller IDs 14085551515, 4085551515, and 5551515 on different dialer interfaces.

Disabling Dial-In

When dial-in is configured on the Services Router, incoming ISDN calls are accepted by the Services Router. However, you can configure the Services Router to reject all incoming ISDN calls when dial-in is configured.

To configure the Services Router to reject incoming ISDN calls, include the **reject-incoming** statement at the **[edit system processes isdn-signaling]** hierarchy level:

```
[edit system processes isdn-signaling]
reject-incoming;
```

For more information about disabling dial-in, see the Junos OS System Basics Configuration Guide and the *Junos OS Interfaces and Routing Configuration Guide*.

Configuring Callback

To configure the dialer interface to call back a specific caller, include the **caller caller-id** statement and the **callback** statement at the **[edit interfaces dln unit logical-unit-number dialer-options]** hierarchy level:

```
[edit interfaces dln unit logical-unit-number]
dialer-options {
  incoming-map {
    caller caller-id;
    callback;
    callback-wait-period time;
  }
}
```

Include the optional **callback-wait-period** statement to change the time at which the dialer interface calls back the caller. The default period is 5 seconds.

Before configuring the callback on a dialer interface, ensure that:

- The dialer interface is not configured as a backup for a primary interface.
- The dialer interface does not have a watch list configured.
- Only one dial string is configured for the dialer interface.
- Dial-in is configured on the dialer interface of the remote router that is dialing in.

Example: Configuring Dial-In and Callback

The following illustrates configurations for dial-in and callback operations.

**Configuration to
Accept All Incoming
Calls**

```
[edit interfaces]
dlo {
  encapsulation ppp;
  unit 0 {
    dialer-options {
      dial-string 7031231282;
      incoming-map;
      accept-all;
    }
    pool 2;
    family inet {
      address 10.1.1.2;
    }
  }
}
```

**Configuration to
Accept Calls from a
Specific Caller ID**

```
[edit interfaces]
dlo {
  encapsulation ppp;
  unit 0 {
    dialer-options {
      incoming-map {
        caller 14082711234;
      }
    }
    pool 1;
    family inet {
      address 10.2.1.1;
    }
  }
}
```

**Configuration to Call
Back Calls from a
Specific Caller ID**

```
[edit interfaces]
dlo {
  encapsulation ppp;
  unit 0 {
    dialer-options {
      incoming-map {
        caller 14082711234;
      }
      callback;
      callback-wait-period 2;
    }
    pool 1;
    family inet {
      address 10.2.1.1;
    }
  }
}
```

Configuring Dialer Watch

Dialer watch is a feature that integrates backup dialing with routing capabilities and provides reliable connectivity without relying on “interesting” packets to trigger outgoing

ISDN connections. With dialer watch, the Services Router monitors the existence of a specified route and if the route fails, the dialer interface initiates the ISDN connection as a backup connection.

To configure dialer watch, perform the steps in the following sections to configure the dialer interface and the physical ISDN interface:

- [Configuring the Dialer Interface on page 43](#)
- [Configuring the Physical Interface on page 43](#)
- [Example: Configuring Dialer Watch on page 43](#)
- [Example: Complete ISDN Called-Calling Router Configuration on page 44](#)

Configuring the Dialer Interface

To configure the dialer interface for dialer watch, include the following statements at the `[edit interfaces dln]` and the `[edit interfaces dln unit logical-unit-number]` hierarchy levels:

```
[edit interfaces]
dln {
  encapsulation (cisco-hdlc | multilink-ppp | ppp);
  hold-time (up | down) milliseconds;
  unit logical-unit-number {
    dialer-options {
      activation-delay seconds;
      deactivation-delay seconds;
      dial-string dial-string-numbers;
      hold-time seconds;
      initial-route-check seconds
      pool pool-name;
      watch-list {
        [ routes ];
      }
      family family {
        ip-address;
      }
    }
  }
}
```

Configuring the Physical Interface

To configure the physical interface for dialer watch, include the `pool` statement at the `[edit interfaces br-pim/O/port dialer-options]` hierarchy level:

```
[edit interfaces br-pim/O/port dialer-options]
pool name;
```

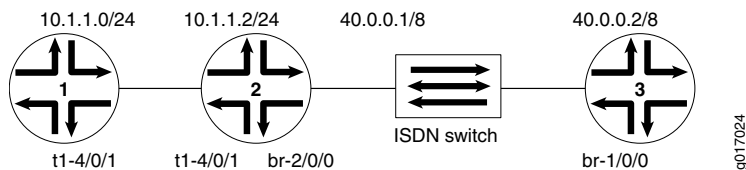
Each physical interface must use the same pool to participate in dialer watch.

Example: Configuring Dialer Watch

The following example illustrates a dialer watch configuration using one physical interface and one dialer interface.

See [Figure 4 on page 44](#) for the topology used in this example.

Figure 4: Dialer Watch Topology



Configuration for the Physical Interface

```
[edit interfaces]
br-2/0/0 {
  isdn-options {
    switch-type ntdms100;
  }
  dialer-options {
    pool 1 priority 1;
  }
}
```

Configuration for the Dialer Interface

```
[edit interfaces]
dlo {
  unit 0 {
    dialer-options {
      pool 1;
      dial-string 384030;
      watch-list {
        2.2.2.2/24;
        3.3.3.3/24;
      }
    }
  }
  family inet {
    address 40.0.0.1/8;
  }
}
```

Example: Complete ISDN Called-Calling Router Configuration

This example configures the calling J Series router (R1) and the calling J Series router (R2). The routers are both directly connected to an ISDN switch.

Configuration of Calling Router (R1)

```
[edit]
system {
  login {
    user isdn {
      uid 2000;
      class super-user;
      authentication {
        encrypted-password "$1$I$8Vkg3V$tySvfBSZhI1vYHSZQ6fM1";
        ## SECRET-DATA
      }
    }
  }
}
services {
  web-management {
```



```

        http;
    }
}

interfaces {
  fe-0/0/0 {
    unit 0 {
      family inet {
        address 192.168.1.1/24;
      }
    }
  }
  br-3/0/0 {
    traceoptions {
      flag q921;
      flag q931;
      file {
        isdn_logg;
      }
    }
    isdn-options {
      switch-type etsi;
      spid1 116;
    }
    dialer-options {
      pool 100;
    }
  }
  dl100 {
    encapsulation ppp;
    unit 0 {
      dialer-options {
        pool 100;
        dial-string 119;
      }
      family inet {
        filter {
          dialer nss;
        }
        address 10.1.1.1/24;
      }
    }
  }
}

firewall {
  family inet {
    dialer-filter nss {
      term 1 {
        from {
          destination-address {
            10.1.1.0/24;
          }
        }
      }
    }
  }
}

```

```
        then note;
      }
    }
  }
}

access {
  profile isdn {
    client isdn chap-secret "$9$Lpax7VsYoGUHwsP5F39C"; ## SECRET-DATA
  }
}
```

Configuration of Called Router (R1)

```
[edit]
system {
  root-authentication {
    encrypted-password "$1$UfcFhjcm$ftfgaLjMgRvFHRt3obrHu."; ## SECRET-DATA
  }
  services {
    web-management {
      http {
        interface [ fe-0/0/0.0 fe-0/0/1.0 ];
      }
    }
  }
  syslog {
    user * {
      any emergency;
    }
    file messages {
      any any;
      authorization info;
    }
    file interactive-commands {
      interactive-commands any;
    }
  }
}

interfaces {
  br-0/0/4 {
    isdn-options {
      switch-type etsi;
      spid1 119;
      tei-option power-up;
    }
    dialer-options {
      pool 100;
    }
  }
  dl100 {
    encapsulation ppp;
    unit 0 {
      dialer-options {
        pool 100;
        dial-string 116;
      }
    }
  }
}
```

```

        incoming-map {
            caller 116;
        }
    }
    family inet {
        filter {
            dialer nss;
        }
        address 10.1.1.2/24;
    }
}

firewall {
    family inet {
        dialer-filter nss {
            term 1 {
                from {
                    address {
                        10.1.1.0/24;
                    }
                }
                then note;
            }
        }
    }
}

```

Disabling ISDN Processes

You can disable ISDN entirely or disable certain processes at the system process level.

To disable ISDN entirely, include the **disable** statement at the **[edit system processes isdn-signaling]** hierarchy level:

```

[edit system processes isdn-signaling]
disable;

```

To disable the dial-out on demand process, include the **disable** statement at the **[edit system processes dialer-services]** hierarchy level:

```

[edit system processes dialer-services]
disable;

```

To disable dial-in and force the Services Router to reject incoming ISDN calls, include the **reject-incoming** statement at the **[edit system processes isdn-signaling]** hierarchy level:

```

[edit system processes isdn-signaling]
reject-incoming;

```


PART 3

ISDN Interfaces Configuration Statement Summary

- [Summary of ISDN Interface Configuration Statements on page 51](#)

CHAPTER 3

Summary of ISDN Interface Configuration Statements

The following descriptions explain each of the interface configuration statements. The statements are organized alphabetically.

access-profile

Syntax	<code>access-profile name;</code>
Hierarchy Level	<code>[edit interfaces interface-name auto-configure vlan-ranges],</code> <code>[edit interfaces interface-name auto-configure stacked-vlan-ranges],</code> <code>[edit interfaces interface-name ppp-options chap],</code> <code>[edit interfaces interface-name ppp-options pap],</code> <code>[edit interfaces interface-name unit logical-unit-number ppp-options chap],</code> <code>[edit interfaces interface-name unit logical-unit-number ppp-options pap],</code> <code>[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options chap],</code> <code>[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options pap]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Support for PAP added in Junos OS Release 8.3. Support for VLAN and stacked VLAN ranges added in Junos OS Release 10.0.
Description	<p>For CHAP authentication, the mapping between peer names (or “clients”) and the secrets associated with their respective links. For PAP authentication, the peer's username and password.</p> <p>For Asynchronous Transfer Mode 2 (ATM2) IQ interfaces only, you can configure a Challenge Handshake Authentication Protocol (CHAP) access profile on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none">• atm-ppp-llc—PPP over AAL5 logical link control (LLC) encapsulation.• atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation. <p>For VLAN and stacked VLAN authentication, the access profile containing the RADIUS accounting and authentication information for the VLAN or stacked VLAN ranges.</p>
Options	name —Name of the access profile.
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PPP Challenge Handshake Authentication Protocol• Configuring the PPP Password Authentication Protocol• default-chap-secret• Junos OS System Basics Configuration Guide


activation-delay

Syntax	<code>activation-delay seconds;</code>
Hierarchy Level	[edit interfaces <i>dlIn</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(J Series Services Routers) For ISDN interfaces, configure the ISDN dialer activation delay. Used only for dialer backup and dialer watch cases.
Options	<p>seconds—Interval before the backup interface is activated after the primary interface has gone down.</p> <p>Range: 1 through 4,294,967,295 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Dialer Interface on page 43 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

backup-options

Syntax	<pre>backup-options { interface <i>interface-name</i>; }</pre>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Configure an interface to be used as a backup interface if the primary interface goes down. This is used to support ISDN dial backup operation.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring an ISDN Dialer Interface as a Backup Interface on page 34 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

callback

Syntax	callback;
Hierarchy Level	[edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options incoming-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options incoming-map]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	<p>On J Series Services Routers with interfaces configured for ISDN, configure the dialer to terminate the incoming call and call back the originator after the callback wait period. The default wait time is 5 seconds. To configure the wait time, include the callback-wait-period statement at the [edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p> <div><p>NOTE: The incoming-map statement is mandatory for the router to accept any incoming ISDN calls.</p></div> <p>If the callback statement is configured, you cannot use the caller caller-id statement at the [edit interfaces <i>dl n</i> unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Dial-In and Callback on page 40• <i>Junos OS Interfaces and Routing Configuration Guide</i>• callback-wait-period on page 55

callback-wait-period

Syntax	<code>callback-wait-period <i>time</i>;</code>
Hierarchy Level	[edit interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	<p>On J Series Services Routers with interfaces configured for ISDN with callback, specify the amount of time the dialer waits before calling back the caller. The default wait time is 5 seconds. The wait time is necessary because, when a call is rejected, the switch waits for up to 4 seconds on point-to-multipoint connections to ensure no other device accepts the call before sending the DISCONNECT message to the originator of the call. However, the default time of 5 seconds may not be sufficient for different switches or may not be needed on point-to-point connections.</p> <p>To configure callback mode, include the callback statement at the [edit interfaces <i>dl</i>n unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p> <p>If the callback statement is configured, you cannot use the caller <i>caller-id</i> statement at the [edit interfaces <i>dl</i>n unit <i>logical-unit-number</i> dialer-options] hierarchy level.</p>
Options	<i>time</i> —Time the dialer waits before calling back the caller.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Dial-In and Callback on page 40 • <i>Junos OS Interfaces and Routing Configuration Guide</i>


caller

Syntax	<code>caller (caller-id accept-all);</code>
Hierarchy Level	[edit interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options incoming-map], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options incoming-map]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, specify the dialer to accept a specified caller number or accept all incoming calls.
Options	<p>caller-id—Incoming caller number. You can configure multiple caller IDs on a dialer. The caller ID of the incoming call is matched against all caller IDs configured on all dialers. The dialer matching the caller ID is looked at for further processing. Only a precise match is a valid match. For example, the configured caller ID 1-222-333-4444 or 222-333-4444 will match the incoming caller ID 1-222-333-4444.</p> <p>If the incoming caller ID has fewer digits than the number configured, it is not a valid match. Duplicate caller IDs are not allowed on different dialers; however, for example, the numbers 1-408-532-1091, 408-532-1091, and 532-1091 can still be configured on different dialers.</p> <p>Only one B-channel can map to one dialer. If one dialer is already mapped, any other call mapping to the same dialer is rejected (except in the case of a multilink dialer). If no dialer caller is configured on a dialer, that dialer will not accept any calls.</p> <p>accept-all—Any incoming call in an associated interface is accepted.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• ISDN Interfaces Overview on page 27• <i>Junos OS Interfaces and Routing Configuration Guide</i>

calling-number

Syntax	<code>calling-number <i>number</i>;</code>
Hierarchy Level	[edit interfaces <i>br-pim</i> /0/ <i>port</i> isdn-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure the calling number to include in outgoing calls.
Options	<i>number</i> —Calling number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Physical Interface Properties on page 29• <i>Junos OS Interfaces and Routing Configuration Guide</i>

chap

Syntax	<pre>chap { access-profile <i>name</i>; challenge-length minimum <i>minimum-length</i> maximum <i>maximum-length</i>; default-chap-secret <i>name</i>; local-name <i>name</i>; passive; }</pre>
Hierarchy Level	<pre>[edit interfaces <i>interface-name</i> ppp-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> ppp-options]</pre>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Allow each side of a link to challenge its peer, using a “secret” known only to the authenticator and that peer. The secret is not sent over the link.</p> <p>By default, PPP CHAP is disabled. If CHAP is not explicitly enabled, the interface makes no CHAP challenges and denies all incoming CHAP challenges.</p> <p>For ATM2 IQ interfaces only, you can configure CHAP on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:</p> <ul style="list-style-type: none"> • atm-ppp-llc—PPP over AAL5 LLC encapsulation. • atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  <p>BEST PRACTICE: On inline service (si) interfaces for L2TP, only the chap statement itself is typically used for subscriber management. We recommend that you leave the subordinate statements at their default values.</p> </div> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PPP Challenge Handshake Authentication Protocol • Junos OS System Basics Configuration Guide • Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface

deactivation-delay

Syntax	<code>deactivation-delay <i>seconds</i>;</code>
Hierarchy Level	[edit interfaces <i>dlIn</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure the ISDN deactivation delay. Used only for dialer backup and dialer watch cases.
Options	<p><i>seconds</i>—Interval before the backup interface is deactivated after the primary interface has come up.</p> <p>Range: 1 through 4,294,967,295 seconds</p> <p>Default: 0 (zero)</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Logical Interface Properties on page 31 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

dial-string

Syntax	<code>dial-string [<i>dial-string-numbers</i>];</code>
Hierarchy Level	[edit interfaces <i>br-pim</i> / <i>O/port</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>br-pim</i> / <i>O/port</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, specify one or more ISDN dial strings used to reach a destination subnetwork.
Options	<i>dial-string-numbers</i> —One or more strings of numbers to call.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Dialer Interface on page 43

dialer

Syntax	<code>dialer <i>filter-name</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Apply a dialer filter to an interface. To create the dialer filter, include the dialer-filter statement at the [edit firewall filter family <i>family</i>] hierarchy level.
Options	<i>filter-name</i> —Dialer filter name.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Applying the Dial-on-Demand Dialer Filter to the Dialer Interfaces on page 36• <i>Junos OS Interfaces and Routing Configuration Guide</i>

dialer-options

Syntax	<pre> dialer-options { activation-delay seconds; callback; callback-wait-period time; deactivation-delay seconds; dial-string [dial-string-numbers]; idle-timeout seconds; incoming-map { caller caller-number accept-all; initial-route-check seconds; load-interval seconds; load-threshold percent; pool pool-name; redial-delay time; watch-list { [routes]; } } } </pre>
Hierarchy Level	<pre> [edit interfaces umd0], [edit interfaces dln unit logical-unit-number], [edit logical-systems logical-system-name interfaces dln unit logical-unit-number] </pre>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Specify the dialer options for configuring logical interfaces for group and user sessions.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Logical Interface Properties on page 31 • Junos Services Interfaces Configuration Release 12.3

encapsulation

See the following sections:

- [encapsulation \(Logical Interface\) on page 63](#)
- [encapsulation \(Physical Interface\) on page 67](#)

encapsulation (Logical Interface)

Syntax	encapsulation (atm-ccc-cell-relay atm-ccc-vc-mux atm-cisco-nlpid atm-mlppp-llc atm-nlpid atm-ppp-llc atm-ppp-vc-mux atm-snap atm-tcc-snap atm-tcc-vc-mux atm-vc-mux ether-over-atm-llc ether-vpls-over-atm-llc ether-vpls-over-fr ether-vpls-over-ppp ethernet ethernet-ccc ethernet-vpls ethernet-vpls-fr frame-relay-ccc frame-relay-ether-type frame-relay-ether-type-tcc frame-relay-ppp frame-relay-tcc gre-fragmentation multilink-frame-relay-end-to-end multilink-ppp ppp-over-ether ppp-over-ether-over-atm-llc vlan-bridge vlan-ccc vlan-vci-ccc vlan-tcc vlan-vpls);
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces rlsq <i>number</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Switches (vlan-ccc and vlan-tcc options only). Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers. Only the atm-ccc-cell-relay and atm-ccc-vc-mux options are supported on ACX Series routers.
Description	Configure a logical link-layer encapsulation type.
Options	<p>atm-ccc-cell-relay—Use ATM cell-relay encapsulation.</p> <p>atm-ccc-vc-mux—Use ATM virtual circuit (VC) multiplex encapsulation on CCC circuits. When you use this encapsulation type, you can configure the ccc family only.</p> <p>atm-cisco-nlpid—Use Cisco ATM network layer protocol identifier (NLPID) encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-mlppp-llc—For ATM2 IQ interfaces only, use Multilink Point-to-Point (MLPPP) over AAL5 LLC. For this encapsulation type, your router must be equipped with a Link Services or Voice Services PIC. MLPPP over ATM encapsulation is not supported on ATM2 IQ OC48 interfaces.</p> <p>atm-nlpid—Use ATM NLPID encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-ppp-llc—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over AAL5 LLC encapsulation.</p> <p>atm-ppp-vc-mux—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over ATM AAL5 multiplex encapsulation.</p> <p>atm-snap—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM subnetwork attachment point (SNAP) encapsulation.</p> <p>atm-tcc-snap—Use ATM SNAP encapsulation on translational cross-connect (TCC) circuits.</p>

atm-tcc-vc-mux—Use ATM VC multiplex encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

atm-vc-mux—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM VC multiplex encapsulation. When you use this encapsulation type, you can configure the **inet** family only.

ether-over-atm-llc—(All IP interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) For interfaces that carry IP traffic, use Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure multipoint interfaces.

ether-vpls-over-atm-llc—For ATM2 IQ interfaces only, use the Ethernet virtual private LAN service (VPLS) over ATM LLC encapsulation to bridge Ethernet interfaces and ATM interfaces over a VPLS routing instance (as described in RFC 2684, *Multiprotocol Encapsulation over ATM Adaptation Layer 5*). Packets from the ATM interfaces are converted to standard ENET2/802.3 encapsulated Ethernet frames with the frame check sequence (FCS) field removed.

ether-vpls-over-fr—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Frame Relay encapsulation to support Bridged Ethernet over Frame Relay encapsulated TDM interfaces for VPLS applications, per RFC 2427, *Multiprotocol Interconnect over Frame Relay*.



NOTE: The SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, and the DS3/E3 MIC do not support Ethernet over Frame Relay encapsulation.

ether-vpls-over-ppp—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Point-to-Point Protocol (PPP) encapsulation to support Bridged Ethernet over PPP-encapsulated TDM interfaces for VPLS applications.

ethernet—Use Ethernet II encapsulation (as described in RFC 894, *A Standard for the Transmission of IP Datagrams over Ethernet Networks*).

ethernet-ccc—Use Ethernet CCC encapsulation on Ethernet interfaces.

ethernet-vpls—Use Ethernet VPLS encapsulation on Ethernet interfaces that have VPLS enabled and that must accept packets carrying standard Tag Protocol ID (TPID) values.



NOTE: The built-in Gigabit Ethernet PIC on an M7i router does not support extended VLAN VPLS encapsulation.

ethernet-vpls-fr—Use in a VPLS setup when a CE device is connected to a PE device over a time-division multiplexing (TDM) link. This encapsulation type enables the PE device to terminate the outer layer 2 Frame Relay connection, use the 802.1p bits inside the inner Ethernet header to classify the packets, look at the MAC address from the Ethernet header, and use the MAC address to forward the packet into a given VPLS instance.

frame-relay-ccc—Use Frame Relay encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

frame-relay-ether-type—Use Frame Relay ether type encapsulation for compatibility with Cisco Frame Relay. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ether-type-tcc—Use Frame Relay ether type TCC for Cisco-compatible Frame Relay on TCC circuits to connect different media. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ppp—Use PPP over Frame Relay circuits. When you use this encapsulation type, you can configure the **ppp** family only. J Series routers do not support frame-relay-ppp encapsulation.

frame-relay-tcc—Use Frame Relay encapsulation on TCC circuits for connecting different media. When you use this encapsulation type, you can configure the **tcc** family only.

gre-fragmentation—For adaptive services interfaces only, use GRE fragmentation encapsulation to enable fragmentation of IPv4 packets in GRE tunnels. This encapsulation clears the do not fragment (DF) bit in the packet header. If the packet's size exceeds the tunnel's maximum transmission unit (MTU) value, the packet is fragmented before encapsulation.

multilink-frame-relay-end-to-end—Use MLFR FRF.15 encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces, and is supported on LSQ and redundant LSQ interfaces.

multilink-ppp—Use MLPPP encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces.

ppp-over-ether—For underlying Ethernet interfaces on J Series routers, use PPP over Ethernet encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface. You also use PPP over Ethernet encapsulation to configure an underlying Ethernet interface for a dynamic PPPoE logical interface on M120 and M320 routers with Intelligent Queuing 2 (IQ2) PICs, and on MX Series routers with MPCs.

ppp-over-ether-over-atm-llc—(J Series routers and MX Series routers with MPCs using the ATM MIC with SFP only) For underlying ATM interfaces, use PPP over Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface.

vlan-bridge—Use Ethernet VLAN bridge encapsulation on Ethernet interfaces that have IEEE 802.1Q tagging, flexible-ethernet-services, and bridging enabled and that must accept packets carrying TPID 0x8100 or a user-defined TPID.

vlan-ccc—Use Ethernet virtual LAN (VLAN) encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-vci-ccc—Use ATM-to-Ethernet interworking encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-tcc—Use Ethernet VLAN encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

vlan-vpls—Use Ethernet VLAN encapsulation on VPLS circuits.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
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Related Documentation

- Configuring Layer 2 Switching Cross-Connects Using CCC
- Configuring the Encapsulation for Layer 2 Switching TCCs
- Configuring Interface Encapsulation on Logical Interfaces
- Configuring MPLS LSP Tunnel Cross-Connects Using CCC
- Circuit and Translational Cross-Connects Overview
- Identifying the Access Concentrator
- Configuring ATM Interface Encapsulation
- Configuring VLAN Encapsulation
- Configuring Extended VLAN Encapsulation
- [Configuring ISDN Logical Interface Properties on page 31](#)
- Configuring ATM-to-Ethernet Interworking
- Configuring Interface Encapsulation on PTX Series Packet Transport Switches
- Configuring CCC Encapsulation for Layer 2 VPNs
- Configuring TCC Encapsulation for Layer 2 VPNs and Layer 2 Circuits
- Configuring ATM for Subscriber Access
- Junos Services Interfaces Configuration Release 12.3
- CoS on ATM IMA Pseudowire Interfaces Overview
- Configuring Policing on an ATM IMA Pseudowire

encapsulation (Physical Interface)

Syntax	encapsulation (atm-ccc-cell-relay atm-pvc cisco-hdlc cisco-hdlc-ccc cisco-hdlc-tcc ethernet-bridge ethernet-ccc ethernet-over-atm ethernet-tcc ethernet-vpls ethernet-vpls-fr ether-vpls-over-atm-llc ethernet-vpls-ppp extended-frame-relay-ccc extended-frame-relay-ether-type-tcc extended-frame-relay-tcc extended-vlan-bridge extended-vlan-ccc extended-vlan-tcc extended-vlan-vpls flexible-ethernet-services flexible-frame-relay frame-relay frame-relay-ccc frame-relay-ether-type frame-relay-ether-type-tcc frame-relay-port-ccc frame-relay-tcc generic-services multilink-frame-relay-uni-nni ppp ppp-ccc ppp-tcc vlan-ccc vlan-vci-ccc vlan-vpls);
Hierarchy Level	[edit interfaces <i>interface-name</i>], [edit interfaces rlsq <i>number:number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for EX Series switches. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Switches (flexible-ethernet-services , ethernet-ccc , and ethernet-tcc options only).
Description	Specify the physical link-layer encapsulation type. Not all encapsulation types are supported on the switches. See the switch CLI.
Default	ppp —Use serial PPP encapsulation.
Options	<p>atm-ccc-cell-relay—Use ATM cell-relay encapsulation.</p> <p>atm-pvc—Use ATM PVC encapsulation.</p> <p>cisco-hdlc—Use Cisco-compatible High-Level Data Link Control (HDLC) framing.</p> <p>cisco-hdlc-ccc—Use Cisco-compatible HDLC framing on CCC circuits.</p> <p>cisco-hdlc-tcc—Use Cisco-compatible HDLC framing on TCC circuits for connecting different media.</p> <p>ethernet-bridge—Use Ethernet bridge encapsulation on Ethernet interfaces that have bridging enabled and that must accept all packets.</p> <p>ethernet-ccc—Use Ethernet CCC encapsulation on Ethernet interfaces that must accept packets carrying standard Tag Protocol ID (TPID) values. For 8-port, 12-port, and 48-port Fast Ethernet PICs, CCC is not supported.</p> <p>ethernet-over-atm—For interfaces that carry IPv4 traffic, use Ethernet over ATM encapsulation. When you use this encapsulation type, you cannot configure multipoint interfaces. As defined in RFC 2684, <i>Multiprotocol Encapsulation over ATM Adaptation Layer 5</i>, this encapsulation type allows ATM interfaces to connect to devices that support only bridge protocol data units (BPDUs). Junos OS does not completely support bridging, but accepts BPDU packets as a default gateway. If you use the router as an edge device, then the router acts as a default gateway. It accepts Ethernet LLC/SNAP frames with IP or ARP in the payload, and drops the rest. For packets destined to the Ethernet LAN, a route lookup is done using the destination</p>

IP address. If the route lookup yields a full address match, the packet is encapsulated with an LLC/SNAP and MAC header, and the packet is forwarded to the ATM interface.

ethernet-tcc—For interfaces that carry IPv4 traffic, use Ethernet TCC encapsulation on interfaces that must accept packets carrying standard TPID values. For 8-port, 12-port, and 48-port Fast Ethernet PICs, TCC is not supported.

ethernet-vpls—Use Ethernet VPLS encapsulation on Ethernet interfaces that have VPLS enabled and that must accept packets carrying standard TPID values. On M Series routers, except the M320 router, the 4-port Fast Ethernet TX PIC and the 1-port, 2-port, and 4-port, 4-slot Gigabit Ethernet PICs can use the Ethernet VPLS encapsulation type.

ethernet-vpls-fr—Use in a VPLS setup when a CE device is connected to a PE device over a time division multiplexing (TDM) link. This encapsulation type enables the PE device to terminate the outer layer 2 Frame Relay connection, use the 802.1p bits inside the inner Ethernet header to classify the packets, look at the MAC address from the Ethernet header, and use the MAC address to forward the packet into a given VPLS instance.

ethernet-vpls-ppp—Use in a VPLS setup when a CE device is connected to a PE device over a time division multiplexing (TDM) link. This encapsulation type enables the PE device to terminate the outer layer 2 PPP connection, use the 802.1p bits inside the inner Ethernet header to classify the packets, look at the MAC address from the Ethernet header, and use it to forward the packet into a given VPLS instance.

ether-vpls-over-atm-llc—For ATM intelligent queuing (IQ) interfaces only, use the Ethernet virtual private LAN service (VPLS) over ATM LLC encapsulation to bridge Ethernet interfaces and ATM interfaces over a VPLS routing instance (as described in RFC 2684, *Multiprotocol Encapsulation over ATM Adaptation Layer 5*). Packets from the ATM interfaces are converted to standard ENET2/802.3 encapsulated Ethernet frames with the frame check sequence (FCS) field removed.

extended-frame-relay-ccc—Use Frame Relay encapsulation on CCC circuits. This encapsulation type allows you to dedicate DLCIs 1 through 1022 to CCC.

extended-frame-relay-ether-type-tcc—Use extended Frame Relay ether type TCC for Cisco-compatible Frame Relay for DLCIs 1 through 1022. This encapsulation type is used for circuits with different media on either side of the connection.

extended-frame-relay-tcc—Use Frame Relay encapsulation on TCC circuits to connect different media. This encapsulation type allows you to dedicate DLCIs 1 through 1022 to TCC.

extended-vlan-bridge—Use extended VLAN bridge encapsulation on Ethernet interfaces that have IEEE 802.1Q VLAN tagging and bridging enabled and that must accept packets carrying TPID 0x8100 or a user-defined TPID.

extended-vlan-ccc—Use extended VLAN encapsulation on CCC circuits with Gigabit Ethernet and 4-port Fast Ethernet interfaces that must accept packets carrying 802.1Q values. For 8-port, 12-port, and 48-port Fast Ethernet PICs, extended VLAN CCC is not supported. For 4-port Gigabit Ethernet PICs, extended VLAN CCC is not supported.

extended-vlan-tcc—For interfaces that carry IPv4 traffic, use extended VLAN encapsulation on TCC circuits with Gigabit Ethernet interfaces on which you want to use 802.1Q tagging. For 4-port Gigabit Ethernet PICs, extended VLAN TCC is not supported.

extended-vlan-vpls—Use extended VLAN VPLS encapsulation on Ethernet interfaces that have VLAN 802.1Q tagging and VPLS enabled and that must accept packets carrying TPIDs 0x8100, 0x9100, and 0x9901. On M Series routers, except the M320 router, the 4-port Fast Ethernet TX PIC and the 1-port, 2-port, and 4-port, 4-slot Gigabit Ethernet PICs can use the Ethernet VPLS encapsulation type.



NOTE: The built-in Gigabit Ethernet PIC on an M7i router does not support extended VLAN VPLS encapsulation.

flexible-ethernet-services—For Gigabit Ethernet IQ interfaces and Gigabit Ethernet PICs with small form-factor pluggable transceivers (SFPs) (except the 10-port Gigabit Ethernet PIC and the built-in Gigabit Ethernet port on the M7i router), use flexible Ethernet services encapsulation when you want to configure multiple per-unit Ethernet encapsulations. Aggregated Ethernet bundles can use this encapsulation type. This encapsulation type allows you to configure any combination of route, TCC, CCC, Layer 2 virtual private networks (VPNs), and VPLS encapsulations on a single physical port. If you configure flexible Ethernet services encapsulation on the physical interface, VLAN IDs from 1 through 511 are no longer reserved for normal VLANs.

flexible-frame-relay—For IQ interfaces only, use flexible Frame Relay encapsulation when you want to configure multiple per-unit Frame Relay encapsulations. This encapsulation type allows you to configure any combination of TCC, CCC, and standard Frame Relay encapsulations on a single physical port. Also, each logical interface can have any DLCI value from 1 through 1022.

frame-relay—Use Frame Relay encapsulation.

frame-relay-ccc—Use Frame Relay encapsulation on CCC circuits.

frame-relay-ether-type—Use Frame Relay ether type encapsulation for compatibility with the Cisco Frame Relay.

frame-relay-ether-type-tcc—Use Frame Relay ether type TCC for Cisco-compatible Frame Relay on TCC circuits to connect different media.

frame-relay-port-ccc—Use Frame Relay port CCC encapsulation to transparently carry all the DLCIs between two customer edge (CE) routers without explicitly configuring each DLCI on the two provider edge (PE) routers with Frame Relay transport. When you use this encapsulation type, you can configure the **ccc** family only.

frame-relay-tcc—Use Frame Relay encapsulation on TCC circuits to connect different media.

generic-services—Use generic services encapsulation for services with a hierarchical scheduler.

multilink-frame-relay-uni-nni—Use MLFR UNI NNI encapsulation. This encapsulation is used on link services, voice services interfaces functioning as FRF.16 bundles, and their constituent T1 or E1 interfaces, and is supported on LSQ and redundant LSQ interfaces.

ppp—Use serial PPP encapsulation.

ppp-ccc—Use serial PPP encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

ppp-tcc—Use serial PPP encapsulation on TCC circuits for connecting different media. When you use this encapsulation type, you can configure the **tcc** family only.

vlan-ccc—Use Ethernet VLAN encapsulation on CCC circuits.

vlan-vci-ccc—Use ATM-to-Ethernet interworking encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only. All logical interfaces configured on the Ethernet interface must also have the encapsulation type set to **vlan-vci-ccc**.

vlan-vpls—Use VLAN VPLS encapsulation on Ethernet interfaces with VLAN tagging and VPLS enabled. Interfaces with VLAN VPLS encapsulation accept packets carrying standard TPID values only. On M Series routers, except the M320 router, the 4-port Fast Ethernet TX PIC and the 1-port, 2-port, and 4-port, 4-slot Gigabit Ethernet PICs can use the Ethernet VPLS encapsulation type.



NOTE: Label-switched interfaces (LSIs) do not support VLAN VPLS encapsulation. Therefore, you can only use VLAN VPLS encapsulation on a PE-router-to-CE-router interface and not a core-facing interface.

Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
---------------------------------	--

**Related
Documentation**

- [Configuring Interface Encapsulation on Physical Interfaces](#)
- [Configuring CCC Encapsulation for Layer 2 VPNs](#)
- [Configuring Layer 2 Switching Cross-Connects Using CCC](#)
- [Configuring TCC Encapsulation for Layer 2 VPNs and Layer 2 Circuits](#)
- [Configuring ATM Interface Encapsulation](#)
- [Configuring ATM-to-Ethernet Interworking](#)
- [Configuring VLAN Encapsulation](#)
- [Configuring Extended VLAN Encapsulation](#)
- [Configuring Encapsulation for Layer 2 Wholesale VLAN Interfaces](#)
- [Configuring Interfaces for Layer 2 Circuits](#)
- [Configuring Interface Encapsulation on PTX Series Packet Transport Switches](#)
- [Configuring an MPLS-Based Layer 2 VPN \(CLI Procedure\)](#)
- [Configuring MPLS LSP Tunnel Cross-Connects Using CCC](#)
- [Configuring TCC](#)
- [Configuring VPLS Interface Encapsulation](#)
- [Configuring Interfaces for VPLS Routing](#)
- [Defining the Encapsulation for Switching Cross-Connects](#)
- [Understanding Encapsulation on an Interface](#)

family

```

Syntax  family family {
        accounting {
            destination-class-usage;
            source-class-usage {
                (input | output | input output);
            }
        }
        access-concentrator name;
        address address {
            ... the address subhierarchy appears after the main [edit interfaces interface-name unit
                logical-unit-number family family-name] hierarchy ...
        }
        bridge-domain-type (bvlan | svlan);
        bundle interface-name;
        core-facing;
        demux-destination {
            destination-prefix;
        }
        demux-source {
            source-prefix;
        }
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
            group filter-group-number;
            input filter-name;
            input-list [ filter-names ];
            output filter-name;
            output-list [ filter-names ];
        }
        interface-mode (access | trunk);
        ipsec-sa sa-name;
        isid-list all-service-groups;
        keep-address-and-control;
        mac-validate (loose | strict);
        max-sessions number;
        max-sessions-vsa-ignore;
        mtu bytes;
        multicast-only;
        negotiate-address;
        no-redirects;
        policer {
            arp policer-template-name;
            input policer-template-name;
            output policer-template-name;
        }
        primary;
        protocols [inet iso mpls];
        proxy inet-address address;
        receive-options-packets;
        receive-ttl-exceeded;
        remote (inet-address address | mac-address address);

```

```

rpf-check {
    fail-filter filter-name
    mode loose;
}
sampling {
    input;
    output;
}
service {
    input {
        post-service-filter filter-name;
        service-set service-set-name <service-filter filter-name>;
    }
    output {
        service-set service-set-name <service-filter filter-name>;
    }
}
service-name-table table-name
short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name destination address destination-profile profile-name;
vlan-id number;
vlan-id-list [number number-number];
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
    eui-64;
    master-only;
    multipoint-destination address dlci dlci-identifier;
    multipoint-destination address {
        epd-threshold cells;
        inverse-arp;
        oam-liveness {
            up-count cells;
            down-count cells;
        }
        oam-period (disable | seconds);
        shaping {
            (cbr rate | rtvbr burst length peak rate sustained rate | vbr burst length peak rate
                sustained rate);
            queue-length number;
        }
        vci vpi-identifier.vci-identifier;
    }
}
preferred;
primary;
vrrp-group group-id {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-key key;
    authentication-type authentication;
}

```

```
fast-interval milliseconds;  
(preempt | no-preempt) {  
    hold-time seconds;  
}  
priority number;  
track {  
    interface interface-name {  
        bandwidth-threshold bits-per-second priority-cost priority;  
        priority-cost priority;  
    }  
    priority-hold-time seconds;  
    route prefix routing-instance instance-name priority-cost priority;  
}  
}  
virtual-address [ addresses ];  
}  
virtual-link-local-address ipv6-address;  
}
```

Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Option max-sessions-vs-a-ignore introduced in Junos OS Release 11.4.
Description	Configure protocol family information for the logical interface.



NOTE: Not all subordinate stanzas are available to every protocol family.

Options *family*—Protocol family:

- **any**—Protocol-independent family used for Layer 2 packet filtering



NOTE: This option is not supported on T4000 Type 5 FPCs.

- **bridge**—(M Series and T Series routers only) Configure only when the physical interface is configured with **ethernet-bridge** type encapsulation or when the logical interface is configured with **vlan-bridge** type encapsulation
- **ccc**—Circuit cross-connect protocol suite
- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite
- **iso**—International Organization for Standardization Open Systems Interconnection (ISO OSI) protocol suite
- **mlfr-end-to-end**—Multilink Frame Relay FRF.15
- **mlfr-uni-nni**—Multilink Frame Relay FRF.16
- **multilink-ppp**—Multilink Point-to-Point Protocol
- **mpls**—Multiprotocol Label Switching (MPLS)
- **pppoe**—Point-to-Point Protocol over Ethernet
- **tcc**—Translational cross-connect protocol suite
- **tnp**—Trivial Network Protocol
- **vpls**—(M Series and T Series routers only) Virtual private LAN service


The remaining statements are explained separately.

Required Privilege Level *interface*—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Protocol Family
- Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX Series Routers
- Junos Services Interfaces Configuration Release 12.3

fast-aps-switch

Syntax	fast-aps-switch;
Hierarchy Level	[edit interfaces <i>interface-name</i> sonet-options aps]
Release Information	Statement introduced in Junos OS Release 12.1.
Description	(M320 routers with Channelized OC3/STM1 Circuit Emulation PIC with SFP only) Reduce the Automatic Protection Switching (APS) switchover time in Layer 2 circuits.
	<div> NOTE:<ul style="list-style-type: none">Configuring this statement reduces the APS switchover time only when the Layer 2 circuit encapsulation type for the interface receiving traffic from a Layer 2 circuit neighbor is SAToP.When the fast-aps-switch statement is configured in revertive APS mode, you must configure an appropriate value for revert time to achieve reduction in APS switchover time.To prevent the logical interfaces in the data path from being shut down, configure appropriate hold-time values on all the interfaces in the data path that support TDM.The fast-aps-switch statement cannot be configured when the APS annex-b option is configured.The interfaces that have the fast-aps-switch statement configured cannot be used in virtual private LAN service (VPLS) environments.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">Reducing APS Switchover Time in Layer 2 Circuits

f-max-period

Syntax	f-max-period <i>number</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> rtp]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For all adaptive services interfaces and for ISDN interfaces on J Series Services Routers. Specify the maximum number of compressed packets allowed between the transmission of full headers in a compressed Real-Time Transport Protocol (RTP) traffic stream.
Options	<i>number</i> —Maximum number of packets. The value can be from 1 through 65535.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Bandwidth on Demand on page 37 • Junos Services Interfaces Configuration Release 12.3

fragment-threshold

Syntax	fragment-threshold <i>bytes</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For multilink, link services, and voice services interfaces, and for J Series Services Routers ISDN interfaces, set the fragmentation threshold.
Options	<i>bytes</i> —Maximum size, in bytes, for multilink packet fragments. Any nonzero value must be a multiple of 64 bytes. Range: 128 through 16,320 bytes Default: 0 bytes (no fragmentation)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Logical Interface Properties on page 31 • Junos Services Interfaces Configuration Release 12.3


idle-timeout

Syntax	<code>idle-timeout seconds;</code>
Hierarchy Level	<code>[edit interfaces dln unit <i>logical-unit-number</i> dialer-options]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure the number of seconds the link is idle before losing connectivity.
Options	seconds —Time for which the connection can remain idle. For interfaces configured to use a filter for traffic, the idle timeout is based on traffic. Range: 1 through 429497295 Default: 120 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Logical Interface Properties on page 31• <i>Junos OS Interfaces and Routing Configuration Guide</i>

incoming-called-number

Syntax	<code>incoming-called-number <i>number</i> <reject>;</code>
Hierarchy Level	<code>[edit interfaces br-pim/0/port isdn-options]</code>
Release Information	Statement introduced on Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, screen incoming calls. If the incoming number is configured, the call is accepted. If the reject option is specified with the number, the call is rejected. If no numbers are configured, all calls are accepted.
Options	number —(Optional) Incoming caller number. Multiple numbers can be configured, up to a maximum of 30 entries. Only a precise match is a valid match. For example, the configured caller number 1-222-333-4444 or 222-333-4444 will match the incoming caller number 1-222-333-4444. reject —(Optional) Rejects the incoming number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring an ISDN Interface to Screen Incoming Calls on page 31• Junos Services Interfaces Configuration Release 12.3

incoming-map

Syntax	incoming-map { <code>caller caller-number</code> accept-all; }
Hierarchy Level	[edit interfaces <i>dl</i> n unit <i>logical-unit-number</i> <code>dialer-options</code>], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> n unit <i>logical-unit-number</i> <code>dialer-options</code>]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	On J Series Services Routers with interfaces configured for ISDN, specify the dialer to accept incoming calls. The statements are explained separately.
<div style="display: flex; align-items: center;">  <div> <p>NOTE: The <code>incoming-map</code> statement is mandatory for the router to accept any incoming ISDN calls.</p> </div> </div>	
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Dial-In and Callback on page 40 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

initial-route-check

Syntax	<code>initial-route-check seconds;</code>
Hierarchy Level	[edit interfaces <i>dl</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, allows the router to check whether the primary route is up after the initial startup of the router is complete and the timer expires.
Options	seconds —How long to wait to check if the primary interface is up after the router comes up. Range: 1 through 300 seconds Default: 120 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• ISDN Interfaces Overview on page 27• <i>Junos OS Interfaces and Routing Configuration Guide</i>

isdn-options

Syntax	<pre> isdn-options { bchannel-allocation (ascending descending); calling-number <i>number</i>; incoming-called-number <i>number</i> <reject>; spid1 <i>spid-string</i>; spid2 <i>spid-string</i>; static-tei-val <i>value</i>; switch-type (att5e etsi nil ntdms100 ntt); t310 <i>seconds</i>; tei-option (first-call power-up); } </pre>
Hierarchy Level	<pre> [edit interfaces br-<i>pim</i>/0/<i>port</i>], [edit interfaces ct1-<i>pim</i>/0/<i>port</i>], [edit interfaces ce1-<i>pim</i>/0/<i>port</i>] </pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>bchannel-allocation option added in Junos OS Release 8.3.</p>
Description	<p>For J Series Services Routers only. Specify the ISDN options for configuring ISDN interfaces for group and user sessions.</p> <p>The statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Physical Interface Properties on page 29 • Allocating B-Channels for Dialout • <i>Junos OS Interfaces and Routing Configuration Guide</i>

load-interval

Syntax	<code>load-interval <i>seconds</i>;</code>
Hierarchy Level	[edit interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN logical interfaces, specify the interval used to calculate the average load on the network. By default, the average interface load is calculated every 60 seconds.
Options	<i>seconds</i> —Number of seconds at which the average load calculation is triggered. Range: 20 through 180, in 10-second intervals Default: 60 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Logical Interface Properties on page 31• <i>Junos OS Interfaces and Routing Configuration Guide</i>

load-threshold

Syntax	<code>load-threshold <i>percent</i>;</code>
Hierarchy Level	[edit interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dlr</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN logical interfaces, specify the bandwidth threshold percentage used for adding interfaces. Another link is added to the multilink bundle when the load reaches the threshold value you set. Specify a percentage between 0 and 100.
Options	<p><i>percent</i>—Bandwidth threshold percentage used for adding interfaces. When set to 0, all available channels are dialed.</p> <p>Range: 0 through 100 seconds</p> <p>Default: 100 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Bandwidth on Demand on page 37 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

mrru

Syntax	<code>mrru bytes;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> mlfr-uni-nni-bundle-options], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For multilink, link services, voice services, and J Series Services Routers ISDN interfaces only, set the maximum received reconstructed unit (MRRU). The MRRU is similar to the MTU, but is specific to multilink interfaces.
Options	bytes —MRRU size. Range: 1500 through 4500 bytes Default: 1500 bytes
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Dialer Interface on page 37• mtu on page 85• Junos Services Interfaces Configuration Release 12.3

mtu

Syntax	<code>mtu bytes;</code>
Hierarchy Level	<pre>[edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>], [edit interfaces <i>interface-range name</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>], [edit logical-systems <i>logical-system-name</i> protocols l2circuit local-switching interface <i>interface-name</i> backup-neighbor <i>address</i>], [edit logical-systems <i>logical-system-name</i> protocols l2circuit neighbor <i>address</i> interface <i>interface-name</i>], [edit logical-systems <i>logical-system-name</i> protocols l2circuit neighbor <i>address</i> interface <i>interface-name</i> backup-neighbor <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols vpls neighbor <i>address</i> backup-neighbor <i>address</i>], [edit protocols l2circuit local-switching interface <i>interface-name</i> backup-neighbor <i>address</i>], [edit protocols l2circuit neighbor <i>address</i> interface <i>interface-name</i>], [edit protocols l2circuit neighbor <i>address</i> interface <i>interface-name</i> backup-neighbor <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols vpls neighbor <i>address</i> backup-neighbor <i>address</i>]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Switches.</p> <p>Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p>
Description	<p>Specify the maximum transmission unit (MTU) size for the media or protocol. The default MTU size depends on the device type. Changing the media MTU or protocol MTU causes an interface to be deleted and added again.</p> <p>To route jumbo data packets on the routed VLAN interface (RVI) on EX Series switches, you must configure the jumbo MTU size on the member physical interfaces and also on the RVI itself (the vlan interface).</p>



CAUTION: For EX Series switches, setting or deleting the jumbo MTU size on the RVI (the **vlan** interface) while the switch is transmitting packets might cause packets to be dropped.



NOTE: If a packet whose size is larger than the configured MTU size is received on the receiving interface, the packet is eventually dropped. The value considered for MRU (maximum receive unit) size is also the same as the MTU size configured on that interface.



NOTE: Not all devices allow you to set an MTU value, and some devices have restrictions on the range of allowable MTU values. You cannot configure an MTU for management Ethernet interfaces (fxp0, em0, or me0) or for loopback, multilink, and multicast tunnel devices.

For more information about configuring MTU for specific interfaces and router or switch combinations, see [Configuring the Media MTU](#).

Options	<p>bytes—MTU size.</p> <p>Range: 256 through 9192 bytes, 256 through 9500 bytes (Junos OS 12.1X48R2 for PTX Series systems)</p> <p>Default: 1500 bytes (INET, INET6, and ISO families), 1448 bytes (MPLS), 1514 bytes (EX Series switch interfaces)</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Gigabit Ethernet Interfaces (CLI Procedure)• Configuring Interfaces for Layer 2 Circuits• Configuring the Media MTU• Configuring Routed VLAN Interfaces (CLI Procedure)• Setting the Protocol MTU

negotiate-address

Syntax	negotiate-address;
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For interfaces with PPP encapsulation, enable the interface to be assigned an IP address by the remote end.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring IPCP Options• address• unnumbered-address (PPP)• Junos OS System Basics Configuration Guide

pool

Syntax	<code>pool <i>pool-name</i> <priority <i>priority</i>>;</code>
Hierarchy Level	[edit interfaces <i>br-pim/0/port</i> dialer-options], [edit interfaces <i>umd0</i> dialer-options], [edit interfaces <i>dlm</i> unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dlm</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers, for logical and physical ISDN interfaces, specify the dial pool. The dial pool allows logical (dialer) and physical (<i>br-pim/0/port</i>) interfaces to be bound together dynamically on a per-call basis. On a dialer interface, pool directs the dialer interface which dial pool to use. On <i>br-pim/0/port</i> interface, pool defines the pool to which the interface belongs.
Options	<i>pool-name</i> —Pool identifier. <i>priority priority</i> —(Physical <i>br-pim/0/port</i> interfaces only) Specify a priority value of 0 (lowest) to 255 (highest) for the interface within the pool.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Physical Interface Properties on page 29 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

ppp-options

Syntax

```
ppp-options {
  authentication [ authentication-protocols ];
  chap {
    access-profile name;
    challenge-length minimum minimum-length maximum maximum-length;
    default-chap-secret name;
    local-name name;
    passive;
  }
  compression {
    acfc;
    pfc;
  }
  dynamic-profile profile-name;
  lcp-max-conf-req number
  lcp-restart-timer milliseconds;
  loopback-clear-timer seconds;
  ncp-max-conf-req number
  ncp-restart-timer milliseconds;
  on-demand-ip-address
  pap {
    access-profile name;
    default-pap-password password;
    local-name name;
    local-password password;
    passive;
  }
}
```

Hierarchy Level [edit interfaces *interface-name*],
[edit interfaces *interface-name* unit *logical-unit-number*],
[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description On interfaces with PPP encapsulation, configure PPP-specific interface properties.

For ATM2 IQ interfaces only, you can configure CHAP on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:

- **atm-ppp-llc**—PPP over AAL5 LLC encapsulation.
- **atm-ppp-vc-mux**—PPP over AAL5 multiplex encapsulation.



BEST PRACTICE: On inline service (si) interfaces for L2TP, only the **chap** and **pap** statements are typically used for subscriber management. We recommend that you leave the other statements subordinate to **ppp-options**—including those subordinate to **chap** and **pap**—at their default values.

The remaining statements are explained separately.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> Configuring the PPP Challenge Handshake Authentication Protocol Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface

redial-delay

Syntax	<code>redial-delay <i>time</i>;</code>
Hierarchy Level	[edit interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options], [edit logical-systems <i>logical-system-name</i> interfaces <i>dl</i> n unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	<p>On J Series Services Routers with interfaces configured for ISDN with dialout, specify the delay (in seconds) between two successive calls made by the dialer. To configure callback mode, include the callback statement at the [edit interfaces <i>dl</i>n unit <i>logical-unit-number</i> <i>dialer-options</i>] hierarchy level.</p> <p>If the callback statement is configured, you cannot use the caller <i>caller-id</i> statement at the [edit interfaces <i>dl</i>n unit <i>logical-unit-number</i> <i>dialer-options</i>] hierarchy level.</p>
Options	<p><i>time</i>—Delay (in seconds) between two successive calls.</p> <p>Range: 2 through 255 seconds</p> <p>Default: 3 seconds</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> ISDN Interfaces Overview on page 27 <i>Junos OS Interfaces and Routing Configuration Guide</i>

spid1

Syntax	<code>spid1 <i>spid1-string</i>;</code>
Hierarchy Level	[edit interfaces <i>br-pim</i> /0/ <i>port isdn-options</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the Service Profile Identifier (SPID).
Options	<i>spid1-string</i> —Numeric SPID.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Physical Interface Properties on page 29• <i>Junos OS Interfaces and Routing Configuration Guide</i>

spid2

Syntax	<code>spid2 <i>spid2-string</i>;</code>
Hierarchy Level	[edit interfaces <i>br-pim</i> /0/ <i>port isdn-options</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure an additional SPID.
Options	<i>spid2-string</i> —Numeric SPID.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Physical Interface Properties on page 29• <i>J Series Services Router Configuration Guide</i>

static-tei-val

Syntax	<code>static-tei-val value;</code>
Hierarchy Level	[edit interfaces <i>br-pim/0/port</i> isdn-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For J Series Services Routers only. Staticly configure the Terminal Endpoint Identifier (TEI) value. The TEI value represents any ISDN-capable device attached to an ISDN network that is the terminal endpoint. TEIs are used to distinguish between several different devices using the same ISDN links.
Options	<i>value</i> —Value between 0 through 63.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring ISDN Physical Interface Properties on page 29 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

switch-type

Syntax	<code>switch-type (att5e etsi ni1 ntdms-100)</code>
Hierarchy Level	[edit interfaces <i>br-pim/0/port</i> isdn-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For J Series Services Routers only. Configure the ISDN variant supported.
Options	<p>att5e—AT&T switch variant.</p> <p>etsi—European Telecommunications Standards Institute switch variant.</p> <p>ni1—National ISDN 1 switch variant.</p> <p>ntdms-100—Northern Telecom DMS-100.</p> <p>ntt—NTT Group switch for Japan.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • ISDN Interfaces Overview on page 27 • <i>Junos OS Interfaces and Routing Configuration Guide</i>

t310

Syntax	t310-value <i>seconds</i> ;
Hierarchy Level	[edit interfaces <i>br-pim/0/port isdn-options</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ISDN interfaces, configure the Q.931-specific timer for T310, in seconds. The Q.931 protocol is involved in the setup and termination of connections.
Options	seconds —Timer value, in seconds. Range: 1 through 65536 seconds Default: 10 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Physical Interface Properties on page 29• <i>Junos OS Interfaces and Routing Configuration Guide</i>

tei-option

Syntax	tei-option (first-call power-up);
Hierarchy Level	[edit interfaces <i>br-pim/0/port isdn-options</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ISDN interfaces, configure when the Terminal Endpoint Identifier (TEI) negotiates with the ISDN provider.
Options	first-call —Activation does not occur until the call setup is sent. power-up —Activation occurs when the Services Router is powered on. Default: power-up
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ISDN Physical Interface Properties on page 29• <i>Junos OS Interfaces and Routing Configuration Guide</i>

watch-list

Syntax	<code>watch-list { [<i>routes</i>]; }</code>
Hierarchy Level	[edit interfaces <i>dl</i> unit <i>logical-unit-number</i> dialer-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On J Series Services Routers with ISDN interfaces, configure an ISDN list of routes to watch. Used only for dialer watch.
Options	routes —IP prefix of a route. Specify one or more. The primary interface is considered up if there is at least one valid route for any of the addresses in the watch list to an interface other than the backup interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Dialer Watch on page 42• <i>Junos OS Interfaces and Routing Configuration Guide</i>

PART 4

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