

## IOLAN SCG Expandable Models Command Reference Guide



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## About This Book

This guide provides the information you need to:

- configure the IOLAN using the Command Line Interface (CLI)

## Intended Audience

This guide is for administrators who will be configuring the Perle IOLAN SCG hereafter knows as the IOLAN.

Some prerequisite knowledge is needed to understand the concepts and examples in this guide:

- If you are using an external authentication application(s), working knowledge of the authentication application(s).
- Knowledge of the file transfer protocols the IOLAN uses.

## Typeface Conventions

Most text is presented in the typeface used in this paragraph. Other typefaces are used to help you identify certain types of information.

The other typefaces are:

Typeface Example	Usage
<b>clear</b> { <b>[ip dhcp binding]</b> }	Commands are in bold blue text and keywords for those command use bold green text.
<i>&lt;WORD&gt;</i>	Arguments in which you supply the values are in purple italics.
<b>username</b> [ <b>nopassword</b> ]   [ <b>privilege 1</b> ]   [ <b>15</b> ]   [ <b>secret 0</b> ]   [ <b>5</b> ]   [ <b>clear-text-password</b> ]   [ <b>hidden-user-secret</b> ]   [ <b>clear-text-password</b> ]	Square brackets means optional elements, but not required to complete the command. Such as command username does not require nopassword, privilege or secret for completion. Vertical bars within this example separate alternative choices and can be viewed as an or between parameters.
<b>snmp-server</b> { <b>contact</b> <i>&lt;contact-name&gt;</i> }	Curly braces surround the entire keyword/optional commands.
	This typeface indicates a book or document title.
See <b>About This Book</b> for more information.	This indicates a cross-reference to another chapter or section that you can click on to jump to that section.

## Setting up the IOLAN

For information on how to set up your IOLAN for the first time, see the Hardware Installation Guide (HIG) or User’s Guide for your product. These are available on the Perle Web site at <https://www.perle.com/downloads/>.



# Using the Command-Line Interface

This book provides the command line interface (CLI) options available for the PerleIOLAN. This chapter describes how to use the command-line interface (CLI) to configure software features. Commands are grouped by Command modes. Some CLI commands may not be applicable to your model or running software.

## Command Modes

Command Mode	Prompt	Exit Mode	Access Next Mode
User EXEC mode	>	<b>logout</b> command	<b>enable</b> command
Privileged EXEC mode	#	<b>disable</b> command	<b>configure</b> command
Global configuration mode	(config)#	<b>end or exit</b> command	<b>interface</b> command
Interface configuration mode	(config-if)# (config-if-range)#	<b>end</b> command	<b>interface</b> command, interface type, interface number
Line configuration mode	(config-line)#	<b>end</b> command	<b>interface</b> command, interface type, interface number

Each command is broken down into several categories:

- **Description**—Provides a brief explanation of how the command is used.
- **Syntax**—Shows the actual command line options. The options can be typed in any order on the command line. The syntax explanation will use the following command to break down the command syntax:

For example: `telnet 172.16.4.92`

This command opens a telnet session to the host with the IP address of 172.16.4.92. If you use a name rather than an IP address, you can use the `/ipv4` option to force the connection to use an IPv4 format for the network address.

For example: `sdm [default|dual-ipv4-and-ipv6]`

This command `sdm` has an option of either `default` or `dual-ipv4-and-ipv6`. You can choose either option but not both.

Braces ({} ) group required choices and vertical bars (|) separate the alternative choices. Square brackets ([]) show the options that are available for the command. You can type a command with each option individually, or string options together in any order you want. Brace and vertical bars within square brackets {[]} means requires a choice within and optional element. The pipe (|) within a square bracket means a choice between the elements.

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For example, valid values for (config)#ip {community-list [expanded | standard]}. Valid values are expanded or standard but you cannot select both at the same time.

- **Options**—Provides an explanation of each of the options for a command and the default value if there is one. Some commands do not have any options, so this category is absent.
- **UP arrow**—show a history of the previous commands entered.

## ***Command Shortcuts***

When you type a command, you can specify the shortest unique version of that command or you can press the **TAB** key to complete the command. For example, the following command:

```
(config)#service dhcp
```

can be typed as:

```
(config)#se d
```

or, you can use the **TAB** key to complete the lines as you go along:

```
se<TAB>d<TAB>
```

where the **TAB** key was pressed to complete the option as it was typed.

## ***Command Options***

When you are typing commands on the command line (while connected to the IOLAN, you can view the options by typing a question mark (?), after any part of the command to see what options are available/valid. For example:

```
#terminal ?
    help
    history
    length
    monitor
    no
    width
```

## ***Common Commands***

### **default**

Use the default command to set a command back to its defaults.

### **disable**

Use the disable command to de-elevate from Privilege EXEC mode to User Exec mode.

### **do-exec**

Run exec commands while in config mode.

### **enable**

Use the enable command to elevate to Privilege EXEC mode from User Exec mode.

---

**exit**

The exit command in User EXEC mode logs you out of the IOLAN. In command mode it takes you to down one level of authority.

**help**

The help command gives you full help or partial help depending on your needs.

**Usage Guidelines**

Help may be requested at any point in a command by entering a question mark '?'. If nothing matches, the help list is empty and you must backup until entering a '?' shows available options.

Two styles of help are provided:

1. Full help is available when you are ready to enter a command argument (e.g. show ?.)
2. Partial help is provided when an abbreviated argument and you want to know what arguments match the input (e.g. 'show pr?'.)

**login**

Log into the IOLAN.

**logout**

Log out of the IOLAN.

**no**

Use the no command to negate a command.



---

> ?

- The ">" indicates that the current mode is "User EXEC"

### *User Exec Mode*

clear	Reset functions
enable	Switch to privilege mode
exit	Exit from EXEC
help	Description of the interactive help
line-attach	Attach to a configured terminal line
logout	Logout of current user
password	Change your password
ping	Send echo messages
release	Release a resource
renew	Renew a resource
show	Display internal settings
ssh	Open a secure shell client connection
telnet	Open a telnet connection
terminal	Set terminal characteristics
testemail	Send a test email message
traceroute	Trace route to destination
two-factor	Change two factor settings

Example:

```
>clear ip dhcp binding *
```

---

# ?

- The "#" indicates that the current mode is "Privileged EXEC"

## ***Privilege EXEC Mode***

archive	Manage archive files
boot	Modify system boot parameters
cd	Change current directory
clear	Reset functions
clock	Manage system clock
configure	Switch to (config)#
copy	Copy from one file to another
debug	Debugging functions (see also 'undebg')
delete	Delete files
dir	List files on a file system
disable	Leave privileged mode
disconnect	Disconnect an existing network connection
dot1x	IEEE 802.1X Exec commands
exit	Exit from the EXEC
help	Description of interactive help
kill	Reset the serial line
line-attach	Attach to a configured terminal line
logout	Logout of current user
mkdir	Create a new directory
more	Display the contents of a file
no	Negate a command or set to defaults
password	Change your password
ping	Send echo messages
pwd	Display present working directory
release	Release a resource
reload	Reboot the IOLAN
rename	Rename a file

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renew	Renew a DHCP lease
reset	Reset commands
rmdir	Remove a directory
serialt	Take a serial trace
show	Display internal settings
shutdown	Shut down the IOLAN.
ssh	Open a secure shell client connection
telnet	Open a telnet connection
terminal	Set terminal characteristics
testemail	Send a test email message
traceroute	Trace route to destination
two-factor	Change your two factor settings
undebg	Disable debugging function (also see 'debug')
vrrp	VRRP commands

Example:

```
(config)#hostname TESTLAB<cr>  
TESTLAB(config)#
```

---

## *Global Configuration Mode*

aaa	Authentication, Authorization and Accounting
alarm	Environmental facilities
archive	Archive software and configuration commands
arp	Set ARP options or static entry
banner	Define a login banner
boot	Modify system boot parameters
bridge	Bridge group and spanning-tree logging
class-map	Configure class map
clock	Configure time-of-day clock
crypto	Encryption operations
default	Set a command to its default
do-exec	Run exec command in config mode
dot1x	IEEE 802.1X global configuration commands
eap	EAP global configure commands
email	Email notifications configuration
enable	Set enable password
end	End the config session
exit	Exit config mode
help	Description of interactive help
hostname	Set system's network name
interface	Select an interface
ip	Global configuration commands
ipv6	Global IPv6 configuration commands
key	Key management
ldap	LDAP server configuration command
line	Configure a terminal line
lldp	Global LLDP configuration subcommands
logging	Set logging

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login	Login configuration
mac	Global MAC configuration subcommands
management-access	Management access commands
nat66	NAT66 interface commands
network-watchdog	Configure network watchdog
no	Negate a command or set its default
ntp	Configure NTP
policy-map	Configure policy map
radius	RADIUS configuration
radius-server	RADIUS server configuration
remote-management	Configure remote management/RESTful API
route-map	Create route map or enter route map mode
router	Enable a routing process
sdm	Configure system network profile (enable IPv6)
serial	Serial commands
service	Network based services configuration
snmp-server	Enable SNMP, modify SNMP engine parameters
tacacs	TACACS+ configuration
tacacs-server	TACACS+ server configuration
tty	Configure terminal controller
username	Configure user name authentication
wan	Configure WAN management
zone	Firewall with zoning
zone-pair	Zone pair firewall

**Example:**

***Show Command Filtering and Redirection***

The IOLAN's CLI command prompt provides you ways of searching through large amounts of show/more output and then filtering the output according to parameters (regular expressions) that you supply on the command line. This allows you to filter on

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patterns such as a phrase, number, or more complex patterns.

A regular expression can be a single-character pattern or a multiple-character pattern. That is, a regular expression can be a single character that matches the same single character in the command output or multiple characters that match the same multiple characters in the command output. The pattern in the command output is referred to as *<LINE>*. This section describes creating both single-character patterns and multiple-character patterns.

```
[begin | count | exclude | include] <LINE> |
  section [exclude | include] <LINE> |
  format json |
  redirect flash: <file-name> |
    ftp://[[username:password@]{hostname | host-ip}/directory]/<filename> |
    http://[[username:password]@]{hostname | host-ip}/ [directory]/<filename> |
    http://[[username:password]@]{hostname | host-ip}/ [directory]/<filename> |
    nvram:<file-name> |
    scp://[[username:password@location]/directory]/<filename> |
    sftp://[//username:password]@location/directory/<filename> |
    tftp://{hostname | host-ip}/ [directory]/<filename> |
  append flash: <file-name> | nvram:<file-name> |
  tee /append]flash:<file-name> |
    ftp://[[username:password@]{hostname | host-ip}/directory]/<filename> |
    http://[[username:password]@]{hostname | host-ip}/ [directory]/<filename> |
    http://[[username:password]@]{hostname | host-ip}/ [directory]/<filename> |
    nvram:<file-name> |
    scp://[[username:password@location]/directory]/<filename> |
    sftp://[//username:password]@location/directory/<filename> |
    tftp://{hostname | host-ip}/ [directory]/<filename>}
```

---

## ***Output Modifiers***

append	Appends redirected output to the specified flash: or nvram: filename.
begin	Begin unfiltered output with the first line that contains the regular expression and every line there after.
count	Displays a count of the number of occurrences of the regular expression.
exclude	Display output lines that do not contain the regular expression.
format	Format the output using the specified format.
include	Display output line that contain the regular expression.
redirect	Redirect output to specified URL and file name. The file is created or overwrites it if it already exists.  Displays output lines that contain the regular expression as well as any lines associated, (any lines immediately following the line that contains the regular expression).
tee	Display the output on-screen while being redirected or appended to the specified URL and file name.
line	This is a regular expression that is used to filter the output. A regular expression is a pattern (a phrase, number, or more complex pattern) that the 's CLI command uses to match against show or more command output. Regular expressions are case-sensitive and allow for simple matching requirements such as "include" entries like "serial or 138".

## ***Single-Character Patterns***

The simplest regular expression is a single character that matches the same single character in the command output.

You can use any letter

- (A-Z, a-z)
- or digits (0-9)
- or characters such as ! or ~

Certain key board characters have special meaning using in regular expressins. The table below lists the keyboard character that have special meaning.

<b>Character</b>	<b>Special Meaning</b>
.	Match any single character, including white space.
*	Matches 0 or more sequences of the pattern.
+	Displays output lines that do not contain the regular expression.
?	Matches 0 or 1 occurrences of the pattern. Use <ctl-v> if you need to enter a "?".
^	Matches the beginning of the string.

---

**\$** Redirect output to specified URL and file name. The file is created or overwrites it if it already exists.

(underscore) Matches a comma (,), left brace ({}), right brace (}), right parenthesis ()), left parenthesis ((), the beginning of the string, the end of the string, or a space.

To use these special characters as single-character patterns, you must remove the special meaning by preceding each character with a backslash (\).

**For example:**

\\$ = \$ (dollar sign)

\\_ = \_ (underscore)

\+ = + (plus symbol)

You can also specify a range of single-character matches against the command output by placing the square brackets around the characters to be matched.

**For example:**

[abcd] or simply [a-d]

You can include a left square bracket ([) as a single-character pattern in your range, by preceding the ([) with a backslash. The following example match son character a-d and ([)

**For example:**

[a-d\[]

You can reverse the matching of the range by including a caret (^) at the start of the range. The following example matches any letter except the ones listed.

**For example:**

[^a-dqsk]

### ***Multiple-Character Patterns***

When creating regular expressions, you can also specify a pattern containing multiple characters. You create multiple-character regular expressions by joining letters, digits, or keyboard characters that do not have special meaning.

**For example:**

a4% = a multiple-character regular expression.

**Note:** Insert a backslash before the keyboard characters that have special meaning when you want to indicate that the character should be interpreted literally.

\\$ = \$ (dollar sign)

\\_ = \_ (underscore)

\+ = + (plus symbol)

Order is important with multiple-character patterns. The regular expression b5! matches the character b followed by a 5 followed by a ! symbol. If the string does not have b5!, in that order, pattern matching fails.



---

In this example the multiple-character regular expression `b.` uses the special meaning of the period character to match the letter `a` followed by any single character. The use of `(.)` period character within a multiple-character expression has a special meaning in that any character matching after the initial character is deemed a match.

**For example:**

`b.` = matches `bb`, `b!`, `b2`

**Note:** You can remove the special meaning of the period character by inserting a backslash before it. For example, when the expression `b\.` is used in the command syntax, only the string `b.` is matched.

You can also create multiple-character regular expressions with combination of letters, digits, and other keyboard characters.

**For example:**

`abc33vu77` is a valid regular expression.

## User Exec Mode

Once you have accessed the IOLAN, you are automatically in User Exec mode. The following commands are valid in User EXEC mode. Some CLI commands may not be applicable to your model or running software.

### clear ip dhcp binding

{clear ip dhcp binding \* | *A.B.C.D*}

Syntax Description	clear ip dhcp binding
*   <i>A.B.C.D</i> }	Type * to clear all automatic bindings. Type the IPv4 address of the specific DHCP binding to clear.
<b>Command Modes</b>	>clear ip dhcp binding
<b>Usage Guidelines</b>	Use this command to clear DHCP client bindings. The * parameter clears all or enter the IPv4 address to clear.
<b>Examples</b>	This example clears all IP DHCP client bindings. clear ip dhcp binding * This example clears IP DHCP bindings for a specified IP address. >clear ip dhcp binding 172.16.113.44
<b>Related Commands</b>	<i>renew</i> <i>release</i>

### enable

Syntax Description	enable
<b>Command Modes</b>	>enable
<b>Usage Guidelines</b>	Use this command to elevate the user from user exec level to privileged level.
<b>Examples</b>	This example sets user level to privileged level. >enable Password:perle #
<b>Related Commands</b>	<i>disable</i>

## line-attach

### line-attach

{**tty**<*WORD*>}

**Syntax Description**

**line-attach**

{**tty**<*WORD*>}

Displays available serial ports configured for the ssh or telnet protocol.

On user log in, line access privileges will be based on this authentication not the original authentication request.

<*WORD*> SSH user name is optional. If it is not entered, the username logged into the IOLAN's main session is used.

**Command Modes**

line-attach

### Usage Guidelines

Use this command to connect to serial ports configured as Console Management ports. The available ports for both Telnet and SSH are displayed.

### Examples

This example connects a user to serial port 1.

```
>line-attach tty 1
```

## logout

### logout

**Syntax Description**

**logout**

**logout**

Logs out of the IOLAN.

**Command Modes**

>logout

### Usage Guidelines

Use this command to log out of the IOLAN.

### Examples

This example logs you out of your IOLAN.

```
>logout
```

## ping

### ping

{<*WORD*> **data** <*HEX DIGITS*> | **repeat** <1-2147483647> | **size** <36-18024>}

**Syntax Description**

**ping**

---

```
{<WORD> data <HEX
DIGITS> | repeat <1-
2147483647> | size <36-
18024>}
```

Configure the destination.

- IPv4 address or IPv6 address
- Host name (pre-configured in your IOLAN host table or a DNS server needs to be reachable)
- Data—input in hex data to repeat
- Repeat—how many time to run the ping command
- Size—Configure the size of the packet to ping with

---

#### Command Default

56 (84) bytes of data  
10 times

---

#### Command Modes

>ping

---

#### Usage Guidelines

Use this command to ping a remote host.

---

This example pings a host with an IP address of 172.16.113.44 and repeats the ping 10 times.

```
>ping 172.16.113.44 repeat 10
```

```
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=2.91 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.17 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=2.93 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.666 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=0.921 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.05 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.118 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.00 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.00 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=1.50 ms
64 bytes from 172.16.4.90: icmp_seq=1 ttl=64 time=0.897 ms
```

---

#### Related Commands

*testemail*

*tracert show ip interface*

## release

### release

```
{dhcp | dhcpv6 bvi <1-9999> | | ethernet . <1-4000>}
```

---

#### Syntax Description

**release dhcp | dhcpv6**

---

```
{dhcp | dhcpv6 bvi <1-9999> |
dot11radio <0-4> | ethernet .
<1-4000>}
```

Type the Ethernet interface (and sub-interface) or BVI interface to release the DHCP/DHCPv6 IP address.

Ethernet values are , sub-interfaces 1–4000

Bvi values are 1-9999

Type the dot11radio interface to release the DHCP /DHCPv6 IP address.

Values are Dot11radio 0–4

---

### Command Modes

>release dhcp

---

### Usage Guidelines

Use this command to release the DHCP/DHCPv6 IP address given to the IOLAN by the DHCP/DHCPv6 server. To obtain a new DHCP/DHCPv6 IP address lease, use the DHCP/DHCPv6 renew command.

---

### Examples

This example releases the DHCP IP address for Ethernet interface 2.

```
>release dhcp ethernet 2
```

---

### Related Commands

*renew*

## renew

### renew

```
{dhcp | dhcpv6 [bvi <1-9999>] | [ethernet . <1-4000>]}
```

---

### Syntax Description

### renew dhcp | dhcpv6

```
{dhcp | dhcpv6 [bvi <1-9999>] | [ethernet .<1-4000>]}
```

Type the Ethernet interface (and sub-interface) or BVI interface to renew the DHCP/DHCPv6 IP address.

Ethernet values are , sub-interfaces 1–4000

Bvi values are 1-9999

Type the dot11radio interface to renew the DHCP/DHCPv6 IP address.

Values are 0–4.

---

### Command Modes

>renew dhcp

---

### Usage Guidelines

Use this command to renew the DHCP/DHCPv6 IP address lease from the DHCP/DHCPv6 server pool.

---

**Examples**

This example renews the DHCP IP address lease on Ethernet 1.

```
>renew dhcp eth 1
```

---

**Related Commands**

*release*

**show alarm****show alarm**

```
{description port |  
profile [<WORD>] |  
settings enabled |  
[<filter/redirection options>]}
```

Syntax	Description	show alarm
{description port		Displays alarm statuses. <ul style="list-style-type: none"> <li>• 1—Link has failed</li> <li>• 2—Port not-forwarding</li> <li>• 3—Port not operating</li> </ul>
profile [ <i>&lt;WORD&gt;</i> ]		Type the alarm profile name to view.
settings enabled		Displays settings for enabled alarms.
[ <i>&lt;filter/redirection options&gt;</i> ]		Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>		>show alarm

---

**Usage Guidelines**

Use this command to display alarm descriptions, profiles, and enabled alarms.

**Link has failed**—The IOLAN generates a link fault alarm when problems with a port's physical layer causes unreliable data transmission. A typical link fault condition is loss of signal or clock. The link fault alarm clears automatically when the link fault condition clears. The severity for this alarm is error condition, level 3.

**Port not forwarding**—Only used for Ethernet ports. The IOLAN generates a port not-forwarding alarm when a port is not forwarding packets. This alarm clears automatically when the port begins to forward packets. The severity for this alarm is warning, level 4.

**Port not operating**—The IOLAN generates a port not-operating alarm when a port fails during the startup self-test. When triggered, the port not-operating alarm only clears when the IOLAN is restarted and the port is operational. The severity for this alarm is error condition, level 3.

---

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

To show alarm descriptions.

```
>show alarms descriptions
1 Link Fault
2 Port not Forwarding
3 Port Not Operating
```

---

```
>show alarms profiles
wlm0, , eth2
```

```
Alarms    link fault, not operating
  Syslog   link fault, not operating
  Notifies link fault, not operating
```

---

### Related Commands

*alarm*

## show arp

```
show arp
{<A.B.C.D> |
[<filter/redirection options>]}
```

---

### Syntax Description

### show arp

{<A.B.C.D>	Displays the ARP table or entry.
{[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>

---

### Command Modes

>show arp

---

### Usage Guidelines

Use this command to display the ARP table or entry.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example displays the ARP table.

---

```
>show arp
Address          Hardware Addr   Interface   Hw Type
172.16.23.124    6c:3b:e5:20:26:db eth3        ether
172.16.73.200    a4:bb:6d:ac:5c:65 eth3        ether
```

---

### Related Commands

*clear arp-cache*  
*arp*

## show clock

### show clock

{[<filter/redirection options>]}

---

#### Syntax Description

#### show clock

{[<filter/redirection options>]}

Output modifiers see *Show Command Filtering and Redirection*

---

#### Command Modes

>show clock

---

#### Usage Guidelines

Use this command to display current clock information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

#### Examples

This example shows you how to display clock information.

```
>show clock
.Tue Mar 16 17:58:02 EDT 2021
```

---

### Related Commands

*clock*

## show crypto

### show crypto

```
{ipsec [client <WORD>] | [esp-group <WORD>] | [ike-group <WORD>] |
[ipsec.conf] | [12tp] | [status] |
openvpn ca [<NAME>] | cert [<NAME>] | connection [<WORD>] | dh
[<WORD>] | key [<NAME>] | secret [<NAME>] | [status] | template [<NAME>]
|
pki client trustpoint | openvpn ca [<NAME>] | cert [<NAME>] | key [<NAME>] |
server trustpoints [<WORD>] | [status] |
ssl |
```



---

[<filter/redirection options>]}

Syntax Description	show crypto
{ipsec [client <WORD>]   [esp-group <WORD>]   [ike-group <WORD>]   [ipsec.conf]   [l2tp]   [status]	Displays crypto details. Displays L2TP details. Displays status. IPsec client (peer)—typically @leftside or a hostname.
openvpn ca [<NAME>]   cert [<NAME>]   connection [<WORD>]   dh [<WORD>]   key [<NAME>]   secret [<NAME>]   [status]   template [<NAME>]}	Displays OpenVPN details.
pki client trustpoint   openvpn ca [<NAME>]   cert [<NAME>]   key [<NAME>]   server trustpoints [<WORD>]   [status]	Displays details for pki client trustpoints, and OpenVPN.
ssl	Displays SSL information.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show crypto

### Usage Guidelines

Use this command to display session information for encryption based services.

### Examples

This example displays the version of SSL installed on the IOLAN.

```
>show crypto ssl
```

```
SSL cipher suite: TLS v1.2
```

### Related Commands

*controller*

*crypto*

## show dot1x

### show dot1x

```
{[all | details | statistics] |
[credential <WORD>] |
[interface ethernet <1-2> details | statistics] |
[radius statistics interface ethernet <1-2>] |
```

---

[<filter/ redirection options>]}

---

**Syntax Description**

**show dot1x**

{[all | details | statistics] |

Select all, details, or statistics to view dot1x connection details.

[credential <WORD>] |

Displays the credential profile for this user.

[interface ethernet 2 details | statistics] |

Enter the Ethernet interface to show connections authenticated with dot1x.

[radius statistics interface ethernet 2] |

Displays RADIUS statistics for authenticator mode.

[<filter/ redirection options>]}

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

>show dot1x

---

**Usage Guidelines**

Use this command to display the connection information for Dot1x supplicant and authenticator connections.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Related Commands**

*dot1x*

*(config-dot1x-creden)*

## show eap

### show eap

{profile <WORD> |

registration |

[<filter/ redirection options>]}

---

**Syntax Description**

**show eap**

{profile <WORD> |

Displays pre-defined EAP profiles.

registrations |

Displays registered EAP methods.

[<filter/ redirection options>]}

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

>show eap

---

### Usage Guidelines

Use this command to display configured methods and pki-trustpoints for EAP configured profiles. EAP profiles are configured using the `eap profile <name>` command. The `registration show` command displays the EAP methods supported by your IOLAN.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example displays eap registrations.

```
>show eap registrations
```

Registered EAP Methods:

```
=====
```

Method	Type	Name
4	Auth and Peer	MD5
6	Auth and Peer	GTC
13	Auth and Peer	TLS
21	Auth and Peer	TTLS
25	Auth and Peer	PEAP
26	Auth and Peer	MSCHAPV2

---

### Related Commands

*eap*

*(config-eap-profile)*

## show environment

### show environment

```
{ [all] | power [status] |
[<filter/redirection options>]}
```

---

#### Syntax Description

#### show environment

```
[<filter/redirection options>]}
```

Output modifiers see *Show Command Filtering and Redirection*

---

#### Command Modes

>show environment

---

### Usage Guidelines

Use this command to show the IOLANenvironment.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays the IOLAN environment.

```
Perle>show environment power<cr>
POWER SUPPLY 1 is OK
POWER SUPPLY 2 is OK
```

**show facility-alarm****show facility-alarm**

```
{
[<filter/redirection options>]}
```

---

**Syntax Description****show facility-alarm**

---

	Displays source and severity of the alarm.
--	--

---

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	--

---

**Command Modes**

>show facility-alarm

---

**Usage Guidelines**

Use this command to display alarm statuses.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples****show flash:****show flash:**

```
[<filter/redirection options>]}
```

---

**Syntax Description****show flash:**

---

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	--

---

**Command Modes**

>show flash:

---

**Usage Guidelines**

Use this command to display files on the internal flash drive.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

```
>show flash:
```

```
Directory of flash:
```

```

14   drwx   4096 Dec 31 2019 19:00 -04:00 doc
32   -rw-   932 Nov 23 2020 16:52 -04:00 perle-internal.log
2254 dr-x   1024 Jan  3 2020 20:36 -04:00 copyright
37   -rw- 717385 Mar 14 2021 04:12 -04:00 managed-devices.yaml
28   -rw-    5 Jan  5 2020 18:27 -04:00 update-sw-control.txt

```

```
1372160 KBytes total (1282048 KBytes free)
```

---

**Related Commands**

*copy*

*delete*

*mkdir*

**show hosts****show hosts**

[<filter/redirection options>]}

---

**Syntax Description****show hosts**

[<filter/redirection options>]}

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

>show hosts

---

**Usage Guidelines**

Use this command to display the host table.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays host table information.

```
>show hosts
```

```
Default domain name is Perle
```

```
DNS lookup is enabled
```

```
Name servers are not configured
```

```
Host Table:
```

```
accounting-host 172.16.77.99
```

```
banking-host 172.16.88.99
```

```
test-host 172.16.55.44
```

---

**Related Commands**

*ip host*

## show ip arp

### show ip arp

[<filter/redirection options>]}

Syntax Description	show ip arp
--------------------	-------------

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	--

Command Modes	>show ip arp
---------------	--------------

### Examples

>show ip arp

Address	Hardware Addr	Interface	Hw Type
0.0.0.0	81:01:71:e1:71:51	eth3	ether
172.16.73.200	41:b1:d1:c1:c1:51	eth3	ether
172.16.1.1	41:c1:c1:a1:91:31	eth3	ether
172.16.23.124	c1:b1:51:a1:61:b1	eth3	ether
172.16.113.215	c1:b1:21:a1:21:11	eth3	ether

### Usage Guidelines

Use this command to display ARP entries.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Related Commands

*arp*

## show ip ddns

### show ip ddns

{service interfaces [bvi <1-9999>] | [dialer <0-15>] | [ethernet | [openvpn-tunnel <0-999] | [tunnel <0-999] | use-web interfaces [bvi <1-9999>] | [| [dialer <0-15>] | | [ethernet | [openvpn-tunnel <0-999] | [tunnel <0-999>] | [<filter/redirection options>]}

Syntax Description	show ip ddns
--------------------	--------------

{service interfaces [bvi <1-9999>]   [dialer <0-15>]   [ethernet   [openvpn-tunnel <0-999]   [tunnel <0-999]	Displays interfaces with DDNS service enabled.
--	--

use-web interfaces [bvi <1-9999>]   [  [dialer <0-15>]     [ethernet   [openvpn-tunnel <0-999]   [tunnel <0-999>]	Web check used for obtaining the external IP address.
---	---

[<filter/redirection options>]}	Output modifiers see
---------------------------------	----------------------

---

<b>Command Modes</b>	>show ip ddns
----------------------	---------------

---

### Usage Guidelines

Use this command to display information for Dynamic DNS (DDNS).

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays the DDNS service configured on Ethernet port 2.

```
>show ip ddns service ethernet 1
Service dyndns
  Login    testddns
  Password *****
```

## show ip dhcp

### show ip dhcp

```
{bindings | pool <WORD> |
[<filter/redirection options>]}
```

Syntax Description	show ip dhcp
{bindings   pool <WORD>	Displays current bindings. Displays current DHCP configured pools.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>

---

### Command Modes

>show ip dhcp

---

### Usage Guidelines

Use this command to display DHCP bindings and pool information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays the configured DHCP pools.

```
>show ip dhcp pool
Pool pooltest :
  Total addresses: 11
  Leased addresses : 2
  Excluded addresses: 0
  IP address Range: 172.16.113.60 - 172.16.113.70
```

### Related Commands

*renew*

*release*

## show ip host-group

```
show ip host-group
{[<WORD>] |
[<filter/redirection options>]}
```

Syntax Description	show ip host-group
{[<WORD>]	Displays IP host group.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show ip host-group

### Usage Guidelines

Use this command to display IP Host Group information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays all IP host groups.

```
>show ip host-group
Host list:
 172.16.66.99
 radius
 Rad2
```

## show ip http

```
show ip http
{server status |
[<filter/redirection options>]}
```

Syntax Description	show ip http
{server status	Displays the configured HTTP server parameters.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show ip http

### Usage Guidelines

Use this command to display HTTP server information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.



---

**Examples**

This example displays the parameters for the HTTP server.

```
>show ip http server status
HTTP server status: Enabled
HTTP server port:80
User session idle timeout: 1440 seconds
HTTP secure server status: Enabled
HTTP secure server port: 443
```

---

**Related Commands**

*ip http*

**show ip interface****show ip interface**

[<filter/redirection options>]}

---

**Syntax Description****show ip interface**

[<filter/redirection options>]}

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

>show ip interface

---

**Usage Guidelines**

Use this command to display all interfaces on the IOLAN.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays the IP interfaces.

```
>show ip interface
```

---

**Related Commands**

*(config-if)#bvi*

*(config-if)#cellular(config-if)#dialer*

*(config-if)#openvpn-tunnel*

*(config-if)#tunnel*

*(config-if)#dot11radio*

**show ip ssh****show ip ssh**

[<filter/redirection options>]}

---

**Syntax Description****show ip ssh**

---

**[<filter/redirection options>]}** Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes** >show ip ssh

---

### Usage Guidelines

Use this command to display IP SSH information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example displays SSH information.

```
>show ip ssh
SSH version: 2
SSH server: Enabled
Authentication timeout: 120 seconds
Authentication retries: 3
SSH public key:
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQBAQCgAtvWaaM0CeMwoZV1H00sni2J8T
YalvSyysQGyBDIOAydaaKv1+s1Imj00FL2Boi3ke/SoKhvuLJQ+bMVFXD7kXw2fk7
1Mo8f8Dd/rOuuF4kE6hKV+LLI44kJKwCUC2w2m4L1IH8Zn8HuX89Qcv2oqPUdkBf
O1nelU3gc6gN4v1ckC069Tgg9hrhghCiBECCCYxmAJUhly4dQcPwO1DQ6Acp2p3
IW2RYdgUvRAIr8oLiVdrEvT7zZECpYgCMYWmfsTtUhv8yZpvNAhV9nRm5E93Yl
0V2J15qlmIISGKn0iiLRW42xjQ4MT5XmWdlXj+NpuMIQRtFzyYPkR2HMf+9
```

---

### Related Commands

*ip ssh*

## show ipv6

### show ipv6

**{dhcp binding | interface client-mode | pool | interface | neighbours [bvi <1-9999>] | [ethernet | [tunnel <0-999>] | [<filter/redirection options>]}**

---

Syntax Description	show ipv6
<b>{dhcp binding   interface client-mode   pool  </b>	Shows DHCP parameters.
<b>interface  </b>	Shows interface configuration and status.
<b>neighbours [bvi &lt;1-9999&gt;]   [ethernet   [tunnel &lt;0-999&gt;]  </b>	Shows neighbors cache entries.

---

**[<filter/redirection options>]}** Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes** >show ipv6

---

### Usage Guidelines

Use this command to display IPv6 information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

Show IPv6 interfaces.

```
>show ipv6 interface
```

---

### Related Commands

*clear ipv6*

*ipv6*

## show ldap

### show ldap

**{statistics [details] |**  
**[<filter/redirection options>]}**

---

**Syntax Description** **show ldap**

---

**{ldap statistics [details] |** Shows LDAP statistics details.

---

**[<filter/redirection options>]}** Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes** >show ldap

---

### Usage Guidelines

Use this command to display LDAP statistic details.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

Shows LDAP statistics details.

```
>show ldap statistic details
```

```
All:
```

	Auth.	Acct.
Requests:	0	0
Responses:	0	0
Access Rejects:	0	

---

**Related Commands***ldap***show line****show line****{console <0-0> |  
[<filter/redirection options>]}****Syntax Description****show line****{console <0-0> |**

Shows whether the console is using the USB or serial port for console mode.

**[<filter/redirection options>]}**Output modifiers see *Show Command Filtering and Redirection***Command Modes**

&gt;show line

**Usage Guidelines**

Use this command to display primary terminal line.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

Shows line statuses.

&gt;show line

Console in use: Serial

Baud rate (TX/RX) is 9600/9600, parity none, 1 stop bit, 8 data bits

**Related Commands***line***show lldp****show lldp****{interface ethernet [<1-2> |  
neighbors interface [ethernet <1-2> [detail | summary] |  
traffic summary] |  
[<filter/redirection options>]}****Syntax Description****show lldp****{interface ethernet <1-2> |**

Displays LLDP interface configuration.

---

<b>neighbors interface [ethernet &lt;1-2&gt; [detail   summary]  </b>	Displays LLDP neighbors information.
---	--------------------------------------

<b>traffic summary  </b>	Displays LLDP statistics.
--------------------------	---------------------------

<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <i>Show Command Filtering and Redirection</i>
--	--

---

<b>Command Modes</b>	>show lldp
----------------------	------------

---

### Usage Guidelines

Use this command to display LLDP interface configuration, neighbors statistics and traffic statistics.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

Show LLDP configuration for Ethernet port 1.

```
>show lldp interface ethernet 1
```

```
Tx: enabled
```

```
Rx: enabled
```

```
Maximum Neighbors: 10
```

```
TLVs Advertised:
```

```
port-description, system-name, system-description, system-capabilities,  
management-address mac-phy-cfg, max-frame-size
```

### Related Commands

*clear lldp*

*lldp*

## show mab

### show mab

**{all details | statistics |  
interface ethernet <1-2>details | statistics |  
radius statistics interface ethernet <1-2> |  
[<filter/redirection options>]}**

---

<b>Syntax Description</b>	<b>show mab</b>
---------------------------	-----------------

---

<b>{all details   statistics  </b>	Displays MAB information.
------------------------------------	---------------------------

<b>interface ethernet &lt;1-2&gt;details   statistics  </b>	Displays interface MAB details.
---	---------------------------------

<b>radius statistics interface ethernet &lt;1-2&gt;  </b>	Displays RADIUS MAB details.
---	------------------------------

<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <i>Show Command Filtering and Redirection</i>
--	--

---

**Command Modes**>show mab

---

**Usage Guidelines**

Use this command to display MAB (MAC Authentication Bypass) for the Ethernet interfaces or RADIUS.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples:**

Shows the MAB interface details for Ethernet interface 1.

```
>show mab interface ethernet 1 details
```

```
Interface      Mac-Auth-Bypass
-----
Ethernet3      Enabled
MAC Auth Bypass Client List
-----
Supplicant      = 00:16:d3:2f:62:bb
EAP Method      = None
Port Control State = Auto
Auth SM State   = AUTHENTICATED
Auth BkEnd SM State = IDLE
Session ID      = B8B01A9D-00000001
Session Time    = 855
Identity        = 0016d32f62bb
Eapol Frame Counters:
Frames Rx       = 2
Frames Tx       = 0
Start Frames Rx = 2
Logoff Frames Rx = 0
Respld Frames Rx = 0
Resp Frames Rx  = 0
Reqld Frames Tx = 0
Req Frames Tx   = 0
Invalid Frames Rx = 0
Length Error Rx = 0
Last Frame Version = 1
Last Frame Source = 00:16:d3:2f 62:bb
```

**show mac****show mac**

```
{access-list [all] | [interfaces] | [list-name <WORD>] |
address-table [address <H.H.H>] | [dynamic] | [interface ethernet <1-2>] |
[multicast] | [static] |
[<filter/redirection options>]}
```

---

**Syntax Description****show mac**

---

<pre>{access-list [all]   [interfaces]   [list-name &lt;WORD&gt;]  </pre>	Displays MAC access list by all, interfaces or list-name.
<pre>address-table [address &lt;H.H.H&gt;]   [dynamic]   [interface ethernet &lt;1-2&gt;   [multicast]   [static]  </pre>	Show MAC address details.
<pre>[&lt;filter/redirection options&gt;]}</pre>	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show mac

---

### Usage Guidelines

Use this command to display a listing of MAC addresses and MAC access lists.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

Show the dynamic MAC address table.

```
>show mac address-table dynamic
```

#### Mac Address Table

```
-----
```

Vlan	Mac Address	Type	Ports
----	-----	-----	----
99	0016.3e08.2cbc	DYNAMIC	eth1
99	0018.f37b.6bb0	DYNAMIC	eth1
99	0024.c4a2.1762	DYNAMIC	eth1
99	0080.d406.1df3	DYNAMIC	eth1
99	00a0.45d9.56dc	DYNAMIC	eth1
99	24b6.fd13.8885	DYNAMIC	eth1
99	3085.a9a7.b59e	DYNAMIC	eth1
99	3c97.0e37.120d	DYNAMIC	eth1
99	588a.5a44.1903	DYNAMIC	eth1
99	7071.bc23.1a8f	DYNAMIC	eth1
99	80ce.62ee.8ab7	DYNAMIC	eth1
99	80ce.62ee.8c2d	DYNAMIC	eth1
99	e840.f24a.2cce	DYNAMIC	eth1
99	f092.1ce3.5748	DYNAMIC	eth1
99	f48e.3898.ee2c	DYNAMIC	eth1

Total Mac Addresses for this criterion: 15

### Related Commands

*mac*

*show mac*

**show ntp**

```
show ntp
{associations |
status |
[<filter/redirection options>]}
```

Syntax Description	show ntp
{associations	NTP clock associations information.
status	NTP clock status.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show ntp

**Usage Guidelines**

Use this command to display NTP associations and status.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

```
>show ntp associations
```

```
remote      refid      st t when poll reach  delay  offset jitter
```

```
=====
172.16.55.77 .INIT.      16 u  - 1024  0  0.000  0.000  0.000
172.16.113.55 .INIT.      16 s  -   32  0  0.000  0.000  0.000
```

```
>show ntp status
```

```
Clock is not synchronized, stratum 16, no reference clock
```

```
Precision is 2**-18 s
```

```
Reference time is 00000000.00000000 (Thu, Feb 7 2036 2:28:16.000)
```

```
Clock offset is 0.000000 msec, root delay is 0.000 msec
```

```
Root dispersion is 1265.970 msec
```

```
System poll interval is 8 s
```

**Related Commands**

*ntp*

**show nvram:**

```
show nvram:
{[<filter/redirection options>]}
```

Syntax Description	show nvram:
{[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show nvram:



---

**Usage Guidelines**

Use this command to display the contents of nvram: file system.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

```
>show nvram:
```

Directory of nvram:

```
89      -rw-   8436 Feb 16 2021 20:50 06:00 startup-config.log.2
 18      -rw-    285 Jan  9 2020 05:06 06:00 no-default-config
 21      -rw-   8950 Feb 19 2021 21:05 06:00 startup-config
 90      -rw-   9054 Feb 18 2021 23:37 06:00 startup-config.log.1
 81      -rw-   9054 Feb 19 2021 21:09 06:00 startup-config.log
 86      -rw-  12289 Nov 23 2020 22:24 06:00 y
 16      -rw-    636 Jan  9 2020 05:06 06:00 default-config
```

1372160 KBytes total (970752 KBytes free)

---

**Related Commands**

*cd*

*copy*

*delete*

*dir*

*mkdir*

*rename*

*rmdir*

*pwd*

**show radius****show radius**

```
{statistics details |
<filter/redirection options>}
```

---

**Syntax Description****show radius**

```
{statistics details |
```

Show RADIUS server statistics.

```
<filter/redirection options>}
```

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

>show radius

---

**Usage Guidelines**

Use this command to show RADIUS details.

---

**Examples**

Use this command to display RADIUS statistics.

```
>show radius statistics
```

All:

	Auth.	Acct.
Requests	3	3
Responses	3	3
Access Requests	3	

---

**Related Commands**

*clear radius*

*aaa*

*radius*

*radius-server*

*ip radius*

**show snmp**

**show snmp**

{**contact** |

**location** |

[<*filter/redirection options*>]}

---

**Syntax Description**

**show snmp**

{**contact** |

Displays contact information

**location** |

Displays location information.

[<*filter/redirection options*>]}

Output modifiers see *Show Command Filtering and Redirection*

---

**Command Modes**

show snmp

---

**Usage Guidelines**

Use this command to show configured options for SNMP.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example show the contact information.

```
>show snmp contact
```

```
Labarea
```

---

**Related Commands**

*snmp-server*

## show ssh

### show ssh

[<filter/redirect options>]}

---

<b>Syntax Description</b>	<b>show ssh</b>
---------------------------	-----------------

---

[<filter/redirect options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
------------------------------	--

---

<b>Command Modes</b>	>show ssh
----------------------	-----------

---

#### Usage Guidelines

Use this command to display users connected via SSH.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

#### Examples

This example show which users are connected.

```
>show ssh
```

Line	User	Host	Idle	Location
1	vtty 1 admin	idle	00:28:26	172.16.113.31

---

#### Related Commands

*show ip ssh*

## show tacacs

### show tacacs

{statistics details |  
[<filter/redirect options>]}

---

<b>Syntax Description</b>	<b>show tacacs</b>
---------------------------	--------------------

---

{statistics details	Displays TACACS+ server statistics.
---------------------	-------------------------------------

[<filter/redirect options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
------------------------------	--

---

<b>Command Modes</b>	>show tacacs
----------------------	--------------

---

#### Usage Guidelines

Use this command to display TACACS+ server details.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

Show TACACS+ statistics.

```
show tacacs statistics
```

All:

	Auth.	Acct.
Requests	3	3
Responses	3	3
Access Requests	3	

**Related Commands**

*clear tacacs*

*(config-sg-tacacs)*

*tacacs*

*(config-tacacs-server)*

**show terminal****show terminal**

```
{[<filter/redirection options>]}
```

**Syntax Description****show terminal**

```
{[<filter/redirection options>]}
```

Output modifiers see *Show Command Filtering and Redirection*

**Command Modes**

>show terminal

**Usage Guidelines**

Use this command to display terminal parameters length, width, history enabled, history size, and logging monitor.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

This examples displays the parameter for terminal.

```
>show terminal
Terminal length = 24
Terminal width = 79
Terminal history is enabled
Terminal history size = 11
Terminal logging monitor is OFF
```

**show users****show users**

```
{all} |
```

```
[console] |
```

```
[rest-api] |
```

```
[vty] |
```

---

[web]	
[<filter/redirection options>]}	
<b>Syntax Description</b>	<b>show users</b>
{all}	Displays all users.
[console]	Displays users connected to the console.
[rest-api]	Displays RESTful API users.
[vty]	Displays users connected via ssh or telnet.
[web]	Displays web users (HTTP/HTTPS).
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show users
<b>Usage Guidelines</b>	
Use this command to display active users.	
Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.	
<b>Examples</b>	
This examples displays all attached web users.	
>show users web	
User	IP Address                      Idle
Lyn	172.16.113.215                      00:11:59
<b>Related Commands</b>	
<i>username</i>	

## show version

<b>show version</b>	
{[backup]	
[flash:]	
[startup]	
[verbose]	
[<filter/redirection options>]}	
<b>Syntax Description</b>	<b>show version</b>
{[backup]	Displays backup version of software.
[flash:]	Displays versions of software in on flash:

---

<b>[startup]</b>	Displays the version of software used for startup.
<b>[verbose]</b> }	Displays details about software running on your IOLAN.
<b>[&lt;filter/redirection options&gt;]</b> }	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	>show version

---

### Usage Guidelines

Use this command to display software version information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays the startup version of software.

```
>show version
```

```
Perle IOLAN SCG Series Console Server, Version: 5.1
```

## ssh

### ssh

```
{<A.B.C.D> <X:X:X:X::X> [-c | -h | -l | -p <A.B.C.D>]}
```

<b>Syntax Description</b>	<b>ssh</b>
---------------------------	------------

---

```
{<A.B.C.D> <X:X:X:X::X> [-c | -h | -l | -p <A.B.C.D>]}
```

Configure a ssh session to a remote host. IPv4 or IPv6 address or hostname to connect to in *<A.B.C.D> <X:X:X:X::X>* format.

- c—select the encryption method
- h—select HMAC algorithm
- l—log in using this user name
- p—connect to this port

<b>Command Modes</b>	>ssh
----------------------	------

---

### Usage Guidelines

Use this command to SSH from your IOLAN to a host supporting the SSH protocol.

### Examples

This example connects to host (172.16.4.90) using lyn as the user.

```
>ssh -l lyn 172.16.4.90
```

---

**Related Commands***show ssh***telnet****telnet****{<A.B.C.D> | <X:X:X:X::X>}**

---

**Syntax Description** **telnet****{<A.B.C.D> | <X:X:X:X::X>}**

Configure a Telnet session to a remote host.

---

**Command Modes**

&gt;telnet

---

**Usage Guidelines**

Use this command to telnet from your IOLAN into a host that supports the telnet protocol.

---

**Examples**

This example telnets to host 172.16.4.90.

&gt;telnet 172.16.4.90

Trying 172.16.4.90...

Connected to 172.16.4.90.

Escape character is '^'.

---

Red Hat Linux release 9 (Shrike)  
Kernel 2.4.20-8custom on an i686  
login:

---

**Related Commands***telnet***terminal****terminal****{history size <0-256> |  
length <0-512> |  
monitor <0-512> |  
width <0-512>}**

---

**Syntax Description** **terminal****{history size <0-256> |**

Configure the size of the history buffer.

**length <0-512> |**

Configure the length of the terminal screen

---

**monitor** <0-512> | Copies debugging logging output to the current terminal line.

---

**width** <0-512>} Configure width of the screen.

---

**Command Default** length-24  
width-132

---

**Command Modes** >terminal

---

### Usage Guidelines

Use this command to configure parameters for your terminal session.

---

### Examples

This example sets the terminal width to 132.

```
>terminal width 132
```

---

### Related Commands

*show terminal*

## testemail

### testemail

{email address}

---

**Syntax Description** **testemail**

---

{email address} Configure the email address.  
Format is user@company.com

---

**Command Modes** >testemail

---

### Usage Guidelines

Use this command to send a test email message.

---

### Examples

```
>testemail ltest@bigshow.com
```

```
Email Test message sent to lfelton@perle.com
```

---

### Related Commands

*ping*

## traceroute

### traceroute



---

```
{<A.B.C.D> | hostname}
```

---

Syntax Description	traceroute
--------------------	------------

---

{<A.B.C.D>   hostname}	Destination hostname or address.
------------------------	----------------------------------

---

Command Modes	>traceroute
---------------	-------------

---

### Usage Guidelines

Use this command to trace network connections from one location to another. When a traceroute is run, it returns a list of network hops and displays the host name and IP address of each connection. It also returns the amount of time it took for each connection to take place (usually in milliseconds). This shows if there were any delays in establishing the connection. Therefore, if a network connection is slow or unresponsive, a traceroute can often explain why the problem exists and also show the location of the problem.

### Examples

This example displays the hops it takes from the IOLAN to IP host address 172.16.4.90.

```
traceroute 172.16.4.90 (172.16.4.90), 30 hop max, 60 bytes packets
1 172.16.4.90 (172.16.4.90) 2.094ms 1.113 ms 0.826 ms
```

---

### Related Commands

*debug*

## two-factor

### two-factor

```
{email <WORD> |
method email}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	two-factor
--------------------	------------

---

{email <WORD>	Sends the security key to this email address. Valid format is llhin@yahoo.ca
---------------	---

---

method email}	Selects the method for sending the security key.
---------------	--

---

Command Modes	>two-factor
---------------	-------------

---

### Usage Guidelines

Use this command to configure for two-factor authentication (2FA). Two factor authentication is a method of establishing access to your IOLAN by requiring you to provide two different types of information. You will need to provide both a password and key to prove your identity to gain access.

---

**Examples**

This example sets your IOLAN for 2-Factor authentication using email.

```
>two-factor
```

```
>email janedoe@yahoo.ca
```

---

**Related Commands**

*username*

*(config-user-2factor)*

## 3 Privileged EXEC mode

---

This chapter contains the CLI commands for Privileged EXEC mode. Some CLI commands may not be applicable to your model or running software.

### archive

#### archive

{**config** |

**download-sw** [/force-reload] | [/no-version-check] | [/reload]

[flash:*perle-image-name.img*] |

[ftp://[[username:password]@location]/directory]/*perle-image-name.img*] |

[http://[[username:password]@][hostname | host-ip] [directory] /*perle-image-name.img*]

|

[https://[[username:password]@][hostname | host-ip] [directory] /*perle-image-name.img*]

[scp://[[username@location]/directory]/*perle-image-name.img*] |

[sftp://[[username:password]@location]/directory]/*perle-image-name.img*] |

[tftp://[location]/directory]/*perle-image-name.img*] |

[update-sw /force-reload] | [/reload | check] |

[downgrade-sw local]

[lte-firmware | download [<list> | <word>] | install <word> | update check <word>] |

---

Syntax Description	archive
{ <b>config</b>	Archives the running configuration. This configuration is saved to a predefined location as specified in the archive command. See <a href="#">(config-archive)#</a> to set up the path to where the configuration file is stored.

---

<p><b>download-sw</b>    <b>[flash:perle-image-name.img]</b>    <b>[ftp://[[username:password]@location]/directory]/perle-image-name.img</b>    <b>[http://[[username:password]@[[hostname   host-ip [directory] /perle-image-name.img]</b>    <b>[https://[[username:password]@[[hostname   host-ip [directory] /perle-image-name.img]</b>    <b>[scp://[[username:password]@location]/directory]/perle-image-name.img</b>    <b>[sftp://[[username:password]@location]/directory]/perle-image-name.img</b>    <b>[tftp://[location]/directory]/perle-image-name.img</b>  </p>	<p>Downloads firmware to your IOLAN.</p> <p><b>/force-reload</b>—unconditionally forces a system reload after successfully downloading the software image.</p> <p><b>/reload</b>—reloads the system (if no unsaved configuration changes have been made) after a successful upgrade.</p> <p><b>/no-version-check</b>—download the software without verifying its version compatibility with the image running.</p>
<p><b>lte-firmware</b>   <b>download</b>    <b>&lt;list&gt;   &lt;WORD&gt;</b>   <b>install</b>    <b>&lt;WORD&gt;</b>   <b>update</b>   <b>check</b>    <b>&lt;WORD&gt;</b>  </p>	<p>LTE firmware files are stored on flash at /product/flash/lte-firmware/EM7455 and //EM7565.</p> <p><b>Download list</b>—displays the available LTE firmware files.</p> <p>Specify <b>download file</b> to download a specific file to the LTE modem chip.</p> <p><b>Install</b>—install LTE firmware file operations.</p> <p><b>Update</b>—check if any updates are available for all installed LTE firmware files.</p>
<p><b>update-sw</b>   <b>/force-reload</b>    <b>/reload</b>   <b>check</b>  </p>	<p>Checks if a software update is available.</p> <p><b>/force-reload</b>—unconditionally forces a system reload after successfully downloading the software image.</p> <p><b>/reload</b>—reloads the system (if no unsaved configuration changes have been made) after a successful upgrade.</p> <p><b>check</b>—check to see if a software update is available.</p>

**downgrade-sw local**

This is a hidden command and should be used with great care.

This command will revert your IOLAN SCG to the older v5.0 software. This software does not support many of the functions which are available in the R6.0 software. Reverting back to release 5.0 software will cause all user data to be erased. The unit will be back in a factory default state and will need to be configured from scratch.

**Command Modes**

#archive

**Usage Guidelines**

Use this command to manage archive files.

Where a username or password is required it can be specified in the IOLAN configuration using the "scp | ftp | sftp | http" command to configure the username and password used instead of specifying it on the archive command.

**flash: *image-file***

The syntax for FTP:

***[ftp://[[username:password]@location]/directory]/perle-image-name.img |***

The syntax for an HTTP server:

***http://[[username:password]@][hostname | host-ip] [directory]/perle-image-name.img***

- The syntax for an HTTPS server:

***https://[[username:password]@][hostname | host-ip] [directory]/perle-image-name.img***

- The syntax for an SCP server:

***[scp://[[username:password]@location]/directory]/perle-image-name.img |***

- The syntax for an SFTP server:

***[sftp://[[username:password]@location]/directory]/perle-image-name.img |***

- The syntax for an TFTP server:

***[tftp://location]/directory]/perle-image-name.img |***

---

**Examples**

This example downloads software from a server with an IP address of 172.16.4.182 to your using secure HTTP (https) and certificate named apache.crt

**Step 1)** Download a secure certificate to the IOLAN

```
#crypto pki import server apache pem url
ftp://172.16.4.182/apach.crt
```

**Step 2)**

Configure your IOLAN with the certificate you just downloaded.

```
#ip http client secure-trustpoint apache
```

**Step 3)**

Set validation off if you do not want to valid the certificate. (You must have created the certificate with validation if you want to valid the certificate)

```
#archive download-sw
https://172.16.4.182/public/IOLAN-software.fit
```

The software is download using secure https.

---

**Related Commands**

*show archive*

*(config-archive)#*

**boot****boot**

{**system backup**}

---

**Syntax Description**

**boot**

{**system backup**}

Boots the system with the backup image.

---

**Command Modes**

#boot

---

**Usage Guidelines**

Use this command to boot the IOLAN using an older saved software version. Older software versions are stored as backup software using the archive command.

---

**Examples**

This example sets your IOLAN to boot using the backup software.

```
boot system backup
```

**cd****cd**

**{flash: | nvram:}****Syntax Description** **cd****{flash: | nvram:}** Change directory on flash: or nvram:**Command Modes** cd**Usage Guidelines**

Use this command to change directory within the flash or nvram file systems.

**Examples**

This example makes a directory under the flash file system, then changes to the new directory.

```
mkdir flash:testdir
```

Created directory name testdir.

```
cd flash:/testdir
```

**Related Commands***copy**boot**delete**pwd**mkdir**more**cd**rename***cellular****cellular**{<0-0>**data-usage clear sim-slot** <1 > |**lte active-profile** [alternative-profile | primary] | connect |**reset sms-log clear**}**Syntax Description** **cellular**

Configure parameters for cellular 0.

**clear sim-slot** <1 > |

Clears data-usage for SIM 1.

**lte active-profile** [alternative-profile | primary] | connect |Select the active profile.  
Enables LTE.**reset sms-log clear**

Clears the SMS log file.

**Command Modes** Perle#cellular**Usage Guidelines**

Use this command to set up LTE parameters.

---

**Examples**

This example clears the SMS log file.  
 Perler#cellular 0 sms-log clear

---

**Related Commands**

*cellular*

**clear aaa****clear aaa**

{aaa local user [fail-attempts all | username <WORD>] | [lockout all | username <WORD>]}

---

**Syntax Description****clear aaa**

{aaa local user [fail-attempts all | username <WORD>] | [lockout all | username <WORD>]}

Resets a locked out user.  
 Resets this locked out user.  
 Resets all locked out users.  
 Resets this user using user name.

---

**Command Modes**

#clear aaa

---

**Usage Guidelines**

Use this command to reset locked out users.

---

**Examples**

This example resets locked out user Marie.  
 #clear aaa local user lockout username Marie

---

**Related Commands**

*username*

**clear arp-cache****clear arp-cache**

{<A.B.C.D> | bvi <1-9999> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2> . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999>}

---

**Syntax Description****clear arp-cache**

{<A.B.C.D> | bvi <1-9999> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2> . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999>}

Clears ARP cache on IP address or interface.



---

<b>Command Modes</b>	clear arp-cache
----------------------	-----------------

---

**Usage Guidelines**

Use this command to clear ARP entries from the ARP table.

**Examples**

This example clears all ARPs from the ARP table for Ethernet interface 1.  
clear arp-cache ethernet 1

**Related Commands**

*show arp*  
*arp*

**clear bridge****clear bridge**

{spanning-tree counters interface bvi <1-9999> | ethernet <1-2>. <1-4000>}

**Syntax Description****clear bridge**

{spanning-tree counters  
interface bvi <1-9999> |  
ethernet <1-2>. <1-4000>}

Clears spanning tree counters.

**Command Modes**

clear bridge

**Usage Guidelines**

Use this command to clear spanning tree counters.

**Examples**

This example clears spanning tree counters on Ethernet interface 1.  
clear bridge spanning-tree counters interface ethernet 1

**Related Commands**

*show bridge*  
*bridge*

**clear counters****clear counters**

{[bvi <1-9999>] | [dot11radio <0-4>] | [ethernet <1-2>] | [loopback] | [tunnel <0-999>]}

**Syntax Description****clear counters**

{[bvi <1-9999>] | [dot11radio  
<0-4>] | [ethernet <1-2> |  
[loopback] | [tunnel <0-999>]}

Clears counters on specified interface.

---

<b>Command Modes</b>	clear counters
----------------------	----------------

---

**Usage Guidelines**

Use this command to clear counters back to zero on the specified interface.

---

**Examples**

This example clears all counters for Ethernet interface 1.

```
clear counters ethernet 1
```

Clear "show interface" counters on this interface [confirm]

**clear ip****clear ip**

```
{alg connections |
  bgp * | [<1-4294967295>] | <A.B.C.D> | [<X:X:X:X::X:X>] | [external in | out |
  soft] |
  dhcp binding <*> | <A.B.C.D> |
  firewall <WORD> |
  route-policy name <WORD> counters | rule <1-9998> counters}
```

---

**Syntax Description****clear ip**

{alg connections	Clears ALG connections.
bgp *   <i>&lt;1-4294967295&gt;</i>   <i>&lt;A.B.C.D&gt;</i>   <i>&lt;X:X:X:X::X:X&gt;</i>   [external in   out   soft]	Type * to clear all BGP sessions or connections. Type the connection number, IPv4, or IPv6 address of the session or connection you want to reset. Configure whether it is an inbound or outbound session. No in/out parameters clears both in and outbound.
dhcp binding <i>&lt;*&gt;</i>   <i>&lt;A.B.C.D&gt;</i>	Type * to clear all automatic client bindings Type the ip address of the client you want to clear the DHCP binding.
firewall <i>&lt;WORD&gt;</i>	Clears the specified firewall statistics.
route-policy name <i>&lt;WORD&gt;</i> counters   rule <i>&lt;1-9998&gt;</i> counters}	Clears counters for route policies.
<b>Command Modes</b>	clear ip

---

**Usage Guidelines**

Use this command to clear IP connections and statistics.

You can clear all DHCP bindings using the \* parameter or clear only the binding for a specific IP address by entering in the IP address to clear.

You can also use this command to clear firewall statistics and counters for route policies.

---

**Examples**

This example clears all DHCP ip bindings from your IOLAN table.

```
clear ip dhcp bindings *
```

This example clears all BGP connections.

```
clear ip bgp *
```

**clear ipv6****clear ipv6**

```
{firewall name <WORD> |  
neighbors <X:X:X:X::X:X> | [bvi <1-9999>] | [cellular <0-0>] | [dialer <0-15>] |  
[dot11radio <0-4>] | [ethernet <1-2>. <1-4000>] | [vrrp <1-255>] | [openvpn-tunnel  
<0-999>] | [tunnel <0-999>] |  
route-policy name <WORD> counters | rule}
```

---

**Syntax Description****clear ipv6**

{ <b>firewall name</b> <WORD>	Clears IPv6 firewalls.
<b>neighbors</b> <X:X:X:X::X:X>   [ <b>bvi</b> <1-9999>]   [ <b>cellular</b> <0-0>]   [ <b>dialer</b> <0-15>]   [ <b>dot11radio</b> <0-4>]   [ <b>ethernet</b> <1-2>. <1-4000>]   [ <b>vrrp</b> <1-255>]   [ <b>openvpn-tunnel</b> <0-999>]   [ <b>tunnel</b> <0-999>]	Clears IPv6 neighbors.
<b>route-policy name</b> <WORD> <b>counters</b>   <b>rule</b> }	Clears IPv6 route policies.

---

**Command Modes**

```
clear ipv6
```

---

**Usage Guidelines**

Use this command to clear IPv6 entries for IPv6 firewalls, neighbors, and route policies.

---

**Examples**

This example clears route policy warehouse.

```
clear ipv6 route-policy warehouse
```

---

**Related Commands**

*show ipv6*  
*ipv6*

**clear ldap****clear ldap**

{**ldap statistics**}

---

**Syntax Description****clear ldap**

---

{**ldap statistics**}

Clears LDAP statistic information.

---

**Command Modes**

clear ldap

---

**Usage Guidelines**

Use this command to clear LDAP statistic information.

---

**Examples**

This example clears LDAP statistics information on your IOLAN.  
clear ldap statistics

---

**Related Commands**

*(config-ldap-server)*  
*show ldap*

**clear line****clear line**

{**console 0-0 | vty <0-15 | tty <1-48**}

---

**Syntax Description****clear line**

---

{**console 0-0 | vty <0-15> tty**  
**<1-48**}

Clears the console, vty or tty sessions.

---

**Command Modes**

clear line

---

**Usage Guidelines**

Use this command to clear the console, vty, or tty session. The session is disconnected and all statistics are cleared.

---

**Examples**

This example clears vty line 1.  
clear line vty 1  
[confirm]  
[Dec 9 16:14:20 %REQHANDLE-6: Cleared VTY1 session  
OK]

**Related Commands***(config-line)#console**(config-line)#vty**(config-line)#tty***clear lldp****clear lldp****{counters | table}****Syntax Description****clear lldp****{counters | table}**

Clears LLDP counters or table.

**Command Modes**

clear lldp

**Usage Guidelines**

Use this command to clear LLDP counters and table.

**Examples**

This example clears the LLDP table.

clear lldp table

**Related Commands***show lldp**lldp***clear logging****clear logging****{logging}****Syntax Description****clear logging****{logging}**

Clears the logging buffer.

**Command Modes**

clear logging

**Usage Guidelines**

Use this command to clear logging buffer.

**Examples**

This example clears the logging buffer.

clear logging

Clear logging buffer[confirm]

---

**Related Commands***show logging***clear radius****clear radius****{radius statistics}****Syntax Description****clear radius****{radius statistics}**

Clears RADIUS statistics.

**Command Modes**

clear radius

**Usage Guidelines**

Use this command to clear RADIUS statistics.

**Examples**

This example clears RADIUS statistics.

clear radius statistics

**Related Commands***radius**radius-server**(config-radius-server)**ip radius***clear tacacs****clear tacacs****{tacacs statistics}****Syntax Description****clear tacacs****{tacacs statistics}**

Clears TACACS+ statistics.

**Command Modes**

clear tacacs

**Usage Guidelines**

Use this command to clear TACACS+ statistics.

**Examples**

This example clears TACACS+ statistical information.

clear tacacs statistics

---

**Related Commands***tacacs**tacacs-server**ip tacacs**(config-tacacs-server)***clock****clock****{set hh:mm:ss | 1-31 | month year 2001-2037}**

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****clock****{set hh:mm:ss | 1-31 | month | 2001-2037}**

Configure the current time and date.

hh:mm:ss (hour, mins, secs)

Day of the month 1-31

Month is

- January
- February
- March,
- April
- May
- June

- July

- August

- September

- November,

- December

Year is 2001-2037

---

**Command Modes**

clock

---

**Usage Guidelines**

Use this command to configure the clock.

---

**Examples**

This example configures the clock to 5 hours off from UTC.

clock set 12:30:10 28 jan 2020

---

**Related Commands***show clock*

## configure

```
configure
{confirm |
revert now | timer <1-120 > | idle <1-120> |
terminal lock | revert timer <1-120> | idle <1-120>}
```

Syntax Description	configure
{confirm	Cancels the revert timer.
revert now   timer <1-120 >   idle <1-120>	Configure the parameters for reverting this config using the rollback feature.
terminal lock   revert timer <1-120>   idle <1-120>}	Locks configuration mode. Revert timer.
<b>Command Modes</b>	configure

### Usage Guidelines

Use this command to change from privileged level mode to configuration mode. This command is also used to configure the parameters for the rollback and terminal lock features.

### Examples

This example changes the user from privileged level mode to terminal configuration mode.

```
configure
Configuring from terminal, memory, or network [terminal]?
(config)#
```

### Related Commands

```
(config-archive)#
archive
```

## copy

```
copy
{flash:filename | ftp flash: | nvram: | running-config | startup-config :filename |
http: filename | https:filename | nvram: filename | running-config filename | scp:
filename | sftp: filename | startup-config filename | tftp:filename}
```

Syntax Description	copy
--------------------	------



---

```
{flash:filename | ftp flash: |
nvram: | running-config |
startup-config :filename |
http: filename | https:filename
| nvram: filename | running-
config filename | scp: filename
| sftp: filename | startup-config
filename | tftp:filename}
```

Copies from one file to another.

---

**Command Modes** copy

---

### Usage Guidelines

Use this command to copy a file from one location to another.

---

### Examples

This example copies a file from the flash: directory to a TFTP server with an IPv4 address of 172.16.4.90.

```
copy flash:running-config-save tftp:
Address or name of remote host[ ]?172.16.4.90
Destination filename [ ]?backup-running-config<cr>
4922 bytes copied in 0.013 seconds
```

---

### Related Commands

*copy**boot**delete**pwd**mkdir**more**cd**rename*

## debug

### debug

{alarmmgr |

all |

bgp events | filters | fsm | keepalives | messages | rib | updates |

bridge spanning-tree packet |

clpd |

dialer |

dot1x-authenticator |

dot1x-supplicant |

drmgrd |

email |

**init** |  
**ip dhcp client** | **relay-agent** | **server** |  
**ip ospf events** | **ism** | **lsa** | **nsm** | **nssa** | **packets** | **rib** |  
**ip rip events** | **packets** | **rib** |  
**ip-sec** |  
**kernel** |  
**lldp** |  
**logging** |  
**ntp** |  
**rest-api** |  
**snmp** |  
**trapmgr** |  
**tty** |  
**vrrp** |  
**vty** |  
**wan-highavail** |  
**wanifmgr** }

Use the no form of this command to negate this command.

Syntax	Description	debug
<b>{alarmmgr</b>		Starts alarm manager debug logging
<b>all</b>		Starts all debugging logging. Setting all debug On can seriously effect the speed of your .
<b>bgp events</b>   <b>filters</b>   <b>fsm</b>   <b>keepalives</b>   <b>messages</b>   <b>rib</b>   <b>updates</b>		Starts debug BGP messages.
<b>bridge spanning-tree packet</b>		Starts debug spanning-tree packets.
<b>clpd</b>		Starts debug clpd messages.
<b>dialer</b>		Starts debug Dial on Demand messages.
<b>dot1x-authenticator</b>		Starts debug dot1x authenticator mode messages.
<b>dot1x-suplicant</b>		Starts debug for dot1x suplicant mode messages.
<b>drmgrd</b>		Starts debug device remote manager daemon messages.
<b>email</b>		Starts debug email messages.
<b>init</b>		Starts debug init messages.

<b>ip dhcp client   relay-agent   server]  </b>	Starts debug dhcp client, relay agent and server messages.
<b>ip ospf events   ism   lsa   nsm   nssa   packets   rib   rip events   packets   rib  </b>	Starts debug OSPF messages.
<b>ip rip events   packets   rib  </b>	Starts debug RIP messages.
<b>ip-sec  </b>	Starts debug IPsec messages.
<b>kernel  </b>	Starts debug kernel messages.
<b>lldp  </b>	Starts debug for LLDP messages
<b>logging  </b>	Starts debug logging messages.
<b>ntp  </b>	Starts debug NTP messages.
<b>rest-api  </b>	Starts debug RESTful-api logging.
<b>snmp  </b>	Starts debug SNMP messages.
<b>trapmgr  </b>	Starts debug trapmgr messages.
<b>tty  </b>	Starts debug tty messages.
<b>vrrp  </b>	Starts debug for VRRP messages.
<b>vty  </b>	Starts debug for vty device messages.
<b>wan-highavail  </b>	Starts debug for WAN high available connections messages.
<b>wanifmgr }</b>	Starts debug for our internal WAN manager messages
<b>Command Default</b>	All debug off
<b>Command Modes</b>	debug

### Usage Guidelines

Use this command to set debug On for features or functions. Setting debug On for all features seriously impacts system performance.

### Examples

This example sets debug on for NTP.

```
debug ntp
```

This example sets debug on for dhcp server.

```
debug ip dhcp server
```

---

**Related Commands**

*ping*  
*undebug*

**delete****delete**

{ **flash:** <filename>  
| **nvrn:** <filename> }

---

**Syntax Description****delete**

---

**flash:** <filename> |

Type the filename to delete on the flash: file system.

---

**nvrn:** <filename> }

Type the filename to delete on the nvrn file system.

---

**Command Modes**

delete

---

**Usage Guidelines**

Use this command to delete a file on flash or the nvrn file system.

---

**Examples**

This example deletes backup.config on flash.  
delete flash:backup.config

---

**Related Commands**

*copy*  
*boot*  
*delete*  
*pwd*  
*mkn*  
*more*  
*cd*  
*rename*

**dir****dir**

{ **flash:** |  
**nvrn:** | **sdflash:** }

---

**Syntax Description****dir**

---

**flash:** |

Displays the contents of flash.

---

<b>sdflash:</b>	Displays the contents of the SD card.
-----------------	---------------------------------------

<b>nvram:</b> }	Displays the contents of nvram.
-----------------	---------------------------------

---

<b>Command Modes</b>	dir
----------------------	-----

---

### Usage Guidelines

Use this command to display the contents of a file system on flash or nvram.

### Examples

```
dir
 34  -rw-   1992 Mar 25 2019 17:39 -04:00 running-config
 39  -rw-   2016 Mar 27 2019 12:35 -04:00 -Mar-27-12-35-22-0
 24  -rw-    896 Jan  4 2001 16:46 -04:00 backup.config
```

---

```
42  -rw-   2068 Mar 28 2019 15:33 -04:00 -Mar-28-15-33-44-3
41  -rw-   2047 Mar 27 2019 16:24 -04:00 -Mar-27-16-24-31-2
40  -rw-   2047 Mar 27 2019 16:24 -04:00 -Mar-27-16-24-26-1
```

---

### Related Commands

*copy*  
*boot*  
*delete*  
*pwd*  
*mkdir*  
*cd*

## disable

### disable

---

<b>Syntax Description</b>	<b>disable</b>
---------------------------	----------------

---

<b>Command Modes</b>	disable
----------------------	---------

---

### Usage Guidelines

Use this command to leave privileged mode.

### Examples

This example sets privileged level to user level.

```
disable<cr>
>
```

### Related Commands

*enable*

## disconnect

### disconnect

```
{ssh vty <0-15>}
```

---

#### Syntax Description

**disconnect**

---

#### Command Modes

disconnect

---

#### Usage Guidelines

Use this command to disconnect an active ssh session.

---

#### Examples

This example disconnects active ssh session vty 1.

```
disconnect ssh vty 1
[confirm]
[OK]
```

---

#### Related Commands

*line*

## dot1x

### dot1x

```
{initialize interface ethernet <1-2> |
re-authenticate interface ethernet <1-2> |
test interface ethernet <1-2>}
```

---

#### Syntax Description

**dot1x**

**initialize interface ethernet <1-2> |**

Devices connected on this Ethernet interface are forced to authenticate. The connection is secured.

**re-authenticate interface ethernet <1-2> |**

Devices connected on this Ethernet interface are forced to re-authenticate.

**test interface ethernet <1-2>}**

Run a 802.1x readiness test to detect any 802.1x clients that are EAPoL capable.

---

#### Command Modes

dot1x

---

#### Usage Guidelines

Use this command to initialize, re-authenticate, and test connected dot1x devices.

---

**Examples**

This example forces devices on Ethernet interface to re-authenticate.

```
enable
dot1x re-authenticate interface eth
```

This example tests for EAPoL capable devices.

```
enable
dot1x test eapol-capable interface eth
#show logging
*Oct 18 02:41:15 %PORT-AUTH-6: eth2: STA 00:13:20:92:29:82 IEEE 802.1X:
INFO_EAPOL_PING_RESPONSE: The interface Ethernet1 has an 802.1x capable
client with MAC (00.13.20.92.29.82)
*Oct 18 01 02:41:15 %PORT-AUTH-6: eth2: STA 00:16:d3:2f:62:bb IEEE 802.1X:
INFO_EAPOL_PING_RESPONSE: The interface Ethernet1 has an 802.1x capable
client with MAC (00.16.d3.2f.62.bb)
```

---

**Related Commands**

*dot1x*  
*show eap*

**exit****exit**

Syntax Description	exit
Command Modes	exit

**Usage Guidelines**

Use this command to exit from EXEC mode.

**Related Commands**

*disable*

**kill****kill**

{line tty <1-48>}

Syntax Description	kill
{line tty <1-48>}	Resets the tty device.
Command Modes	kill line tty

**Usage Guidelines**

Use this command to kill a serial line session.

Killing a line resets that serial line and loads any newly configured parameters.

---

**Examples**

This example resets (kills) the line for tty 1. Any users connected are disconnected.  
kill line tty

---

**Related Commands**

*line*

**line-attach****line-attach**

{**tty** <1-48> | <WORD>}

---

**Syntax Description**

{**tty** <1-48> | <WORD>}

---

**line-attach**

Displays available serial ports configured for ssh or telnet protocol. If the user logs in, line access privileges are based on this authentication not the original authentication request.

<WORD>SSH user name is optional. If it is not entered, the username which logged into the IOLAN's main session are used.

---

**Command Modes**

line-attach

---

**Usage Guidelines**

Use this command to connect to serial ports configured as Console Management ports. The available ports for both Telnet and SSH are displayed.

---

**Examples**

This example allows a user to connect to serial port 1 using the SSH protocol and ssh user sshlyn.

Perle#line-attach tty 1 sshlyn

---

**Related Command**

*(config-line)#tty*

**logout****logout**

{**logout**}

---

**Syntax Description**

---

**logout**



---

<b>{logout}</b>	Logs you out of your IOLAN.
-----------------	-----------------------------

---

<b>Command Modes</b>	logout
----------------------	--------

---

### Usage Guidelines

Use this command to log out of your IOLAN.

## mkdir

### mkdir

**{flash:}**

---

<b>Syntax Description</b>	<b>mkdir</b>
---------------------------	--------------

---

<b>{flash:}</b>	Makes a directory on the flash file system.
-----------------	---

---

<b>Command Modes</b>	mkdir
----------------------	-------

---

### Usage Guidelines

Use this command to make a new directory on the flash file system.

### Examples

This example makes a directory under the flash file system.

```
enable<cr>
```

```
mkdir flash:testing<cr>
```

```
dir
```

```
Directory of flash:
```

```
130307 drwx 4096 Jan 2 2019 19:58 -05:00 testdir
```

```
130306 -rw- 1508 Jan 2 2019 17:46 -05:00 test-config
```

```
130308 drwx 4096 Jan 3 2019 18:49 -05:00 testing
```

---

### Related Commands

*copy*

*boot*

*delete*

*pwd*

*mkdir*

*more*

*cd*

## more

### more

**{/ascii | /binary | flash: | nvram: | running-config | startup-config |**

---

<b>Syntax Description</b>	<b>more</b>
---------------------------	-------------

---

<b>{/ascii   /binary   flash:   nvram:   running-config   startup-config  </b>	Forces the file type to display in ASCII format. Forces the file type to display binary format. Displays the content of a file.
--	---

---

<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <a href="#"><i>Show Command Filtering and Redirection</i></a>
--	---

---

<b>Command Modes</b>	more
----------------------	------

---

### Usage Guidelines

Use the more command to display a file contents. Specify whether to show the contents in ASCII or binary format.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

---

### Examples

This example views the file contents of nvram.  
more nvram:no-default-config

---

## password

### password

---

<b>Syntax Description</b>	<b>password</b>
<b>password</b>	Changes password for current logged in user
<b>Command Modes</b>	>password

---

### Usage Guidelines

Use this command to change the password for the current user.

---

### Examples

This example changes the password for the current logged in user.  
password

Password must be less than 128 characters long  
May not use 5 previous passwords  
Enter Old Password:

Enter New Password:

Re-Enter Password:  
Password Changed Successfully

## ping

### ping

```
{<WORD> [data <HEX DIGITS>] | [repeat <1-2147483647>] | [size <36-18024>]}
```

---

<b>Syntax Description</b>	<b>ping</b>
---------------------------	-------------

---

```
{<WORD> [data <HEX DIGITS>] | [repeat <1-2147483647>] | [size <36-18024>]}
```

Host name must be predefined in the host table.  
Data hex pattern is from 1 to 32 hex characters.  
Repeat count is from 1–2147483647.  
Datagram size is from 36–18024.

---

<b>Command Modes</b>	ping
----------------------	------

---

### Usage Guidelines

Use this command to ping a remote host.

### Examples

This example pings a host with an ip address of 172.16.113.44 repeating the ping request 10 times.

```
ping 172.16.113.44 repeat 10
```

This example pings a host with an ip address of 172.16.113.44 with hex data pattern of f1f1f1f1f1.

```
ping perlehost data f1f1f1f1f1
```

This example pings a host with an ip address of 172.16.113.44 with a data packet size of 40 bytes.

```
ping perlehost size 40
```

### Related Commands

*undebug*

## pwd

### pwd

---

<b>Syntax Description</b>	<b>pwd</b>
---------------------------	------------

---

<b>Command Modes</b>	pwd
----------------------	-----

---

### Usage Guidelines

Use this command to display your current file system.

### Examples

This command displays the file system you are in.

```
cd nvram:
pwd<cr>
nvram:
```

---

**Related Commands**

*copy*  
*boot*  
*delete*  
*pwd*  
*mkdir*  
*more*  
*cd*  
*rename*

**release**

See *release*

**reload****reload**

{*at hh:mm* |  
*cancel* | *in mmm* | [*hh:mm*]}

**Syntax Description****reload**

{*at hh:mm* |

Configure **at**—the time in hours and minutes when to reload the firmware on the IOLAN.

*cancel* |

Configure **cancel**—any pending reload commands.

*in mmm* | [*hh:mm*]}

Configure **in**—minutes 1-999 or hours minutes when to reload the firmware on the IOLAN.

**Command Modes**

reload

**Usage Guidelines**

Use this command to reload the IOLAN firmware. The IOLAN powers off and then reboots. Any configuration not copied from running-config to startup-config is lost.

**Examples**

Reloads the firmware on the IOLAN in 10 hours and 20 mins.  
 reload 10:20

Cancels the previous reload command.  
 reload cancel  
 \*\*\*\*\*  
 \*\*\*\*\* ----SHUTDOWN ABORTED ---  
 \*\*\*\*\*

---

**Related Commands***show reload*

---

**Note:** Before reloading the IOLAN copy running config to startup config to save any changes that you want permanently saved.

---

**rename****rename****{flash: <WORD> | nvram: <WORD>}**

---

**Syntax Description****rename**

---

**{flash: <WORD> | nvram: <WORD>}**  
Renames the file.

---

**Command Modes**

rename

---

**Usage Guidelines**

Use this command to rename a file on flash or nvram.

---

**Examples**

This example rename a file on flash from testdir to newdir.

rename flash:testdir flash:backup  
Destination file name[backup]?

---

**Related Commands***copy**boot**delete**pwd**mkdir**more**cd**rename***renew**See *renew***reset****reset****{factory}**

---

**Syntax Description****reset**

---

**{factory}** Resets the IOLAN to factory default—removing all configuration files, certificates and keys.

---

**Command Modes** reset

---

### Usage Guidelines

Use this command to set the IOLAN to factory defaults,

---

### Related Commands

*boot*

## rmdir

### rmdir

**{flash: <WORD>}**

---

**Syntax Description** **rename**

---

**{flash: <WORD>}** Removes the directory on flash.

---

**Command Modes** rmdir

---

### Usage Guidelines

Use this command to remove a file on flash.

---

### Examples

This example removes a directory on flash.

```
rmdir flash:testit
```

Remove Directory name [testit]?

---

### Related Commands

*copy*

*boot*

*delete*

*pwd*

*renew*

*mkdir*

## safely-eject

### safely-eject

**{sdflash: <CR>}**

---

**Syntax Description** **rename**

---

**{sdflash:}** Allows for safe removal of the SD card.

---

<b>Command Modes</b>	safely-eject
----------------------	--------------

---

### Usage Guidelines

Use this command before removing the SD card from the unit. This will ensure that any cached files are written to the flash before it is removed.

### Examples

This example allows for safe removal of the SD flash card from the IOLAN SCG.

```
safely-eject sdflash:
Safe to Remove SDflash
```

### Related Commands

*copy*  
*delete*  
*mkdir*

## serialt

### serialt

```
{<WORD> #[mask] [...] [-full] [-size=# [-show]]}
```

<b>Syntax Description</b>	<b>serialt</b>
---------------------------	----------------

{<WORD> #[mask] [...] [-full] [-size=# [-show]]}	Takes a serial line trace.
--	----------------------------

<b>Command Modes</b>	serialt
----------------------	---------

### Usage Guidelines

Use this command to capture data on the serial line.

### Examples

This example captures all data on serial port 1 and displays it to the screen.

```
serialt 1 -show
Tracing port 1=rx+tx+signals+special
```

To stop the trace press Ctrl-C  
9

---

Use the "Space Bar" and the keys 1,2,3,4 to control the scrolling speed.  
Please press the "Space Bar" to continue.....

Use the "Space Bar" and the keys 1,2,3,4 to control the scrolling speed.  
Please press the "Space Bar" to continue.....

Decode Complete... 0 entries processed

---

```

SERIAL TRACE V1.00

To start a serial trace:
=====
serialt #[=mask] [...] [-full] [-size=#] [-show]
   |      |         |         |         |
   |      |         |         |         | then show the trace file
   |      |         |         |         | size in kilobytes (2-1024)
   |      |         |         |         | stop when trace file full else wrap
   |      |         |         |         | another port/mask to simultaneously trace
   |      |         |         |         | optional trace mask any combination of:
   |      |         |         |         | rx+tx+signals+special+ioctl or use: normal,all,same
   |      |         |         |         | port number 1->max

Serial trace file utilities:
=====
serialt [-show] [-remove]
   |         |
   |         | remove the trace file
   |         | show the trace file

```

---

## Related Commands

[\*undebg\*](#)

## show aaa

**show aaa**

```

{local user lockout |
|<filter/redirection options>}

```

Syntax	Description	show aaa
{aaa local user lockout		Displays users locked-out of the IOLAN.
<filter/redirection options>]		Output modifiers see <a href="#"><i>Show Command Filtering and Redirection</i></a>
<b>Command Modes</b>		show aaa

## Usage Guidelines

Use this command to display the current locked-out users on the IOLAN.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

## Examples

This example shows you the current locked out users on the IOLAN.

```
show aaa local user lockout
```

```
Locked-out users: Lyn
```

## Related Commands

[\*aaa\*](#)



## show alarm

See *show alarm*

## show archive

### show archive

{**config rollback timer** |  
**update-sw** |  
[<*filter/redirection options*>]}

Syntax	Description	show archive
{ <b>config rollback timer</b>		Displays configuration rollback and timer information.
<b>update-sw</b>		Displays the Check Software update option.
[< <i>filter/redirection options</i> >]}		Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>		show archive

### Usage Guidelines

Use this command to display config rollback and the update feature.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays the config for the rollback feature.

```
show archive
```

The maximum archive configurations allowed is 14.

There are currently 9 archive configurations saved.

The next archive file is named flash:-<timestamp>-9

```
Archive # Name
```

```
Archive # Name
```

```
1 flash:-May-19-14-14-16-0
```

```
2 flash:-May-19-14-17-50-1
```

```
3 flash:-May-1914-19-00-2 4 flash:-May-19-14-19-14-3
```

---

```

4 flash:-May-19-14-19-14-3
5 flash:-May-19-14-20-55-4
6 flash:-May-19-14-24-31-5
7 flash:-May-19-15-05-37-6
8 flash:-May-19-03-37-55-7
9 flash:-May-19-03-38-10-8 <- Most Recent
10
11
12
13
14

```

---

### Related Commands

*archive*

## show arp

See *show arp*

## show bgp

### show bgp

```

{community |
community-list <1-500 > | <WORD> exact-match |
filter-list <WORD> |
memory |
neighbors <A.B.C.D> | <X:X::X:X> |
prefix-list <WORD> |
regexp <LINE> |
route-map <LINE> |
[<filter/redirection options>]}

```

### Syntax Description

### show bgp

{ <b>bgp community</b>	Displays the routes matching the communities.
<b>community-list</b> <1-500 >   <WORD> exact-match	Displays the routes matching the community list.
<b>filter-list</b> <WORD>	Displays the routes conforming to the filter list.
<b>memory</b>	Displays Global BGP memory statistics.
<b>neighbors</b> <A.B.C.D>   <X:X::X:X>	Detailed list for TCP and BGP neighbor connections.
<b>prefix-list</b> <WORD>	Displays the routes matching the prefix-list.

---

<b>regex</b> <LINE>	Displays the routes matching the AS path regular expression.
<b>route-map</b> <LINE>	Displays the routes matching the route-map.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<hr/>	
<b>Command Modes</b>	show bgp

---

### Usage Guidelines

Use this command to show BGP information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays BGP neighbors.

```
show bgp neighbors
BGP neighbor is 172.16.39.2, remote AS 65537, local AS 65536, external link
  BGP version 4, remote router ID 172.16.39.2
  BGP state = Established, up for 00:14:28
  Last read 05:39:27, hold time is 180, keepalive interval is 60 seconds
  Neighbor capabilities:
    4 Byte AS: advertised and received
    Route refresh: advertised and received(old & new)
    Address family IPv4 Unicast: advertised and received
  Message statistics:
    Inq depth is 0
    Outq depth is 0
      Sent      Rcvd
  Opens:           1      0
  Notifications:   0      0
  Updates:         1      1
  Keepalives:     16     15
  Route Refresh:   0      0
  Route Refresh:   0      0
  Capability:      0      0
  Total:          18     16
```

Minimum time between advertisement runs is 30 seconds

For address family: IPv4 Unicast

```
  Community attribute sent to this neighbor(both)
  1 accepted prefixes
```

Connections established 1; dropped 0

Last reset never

Local host: 172.16.39.1, Local port: 179

Foreign host: 172.16.39.2, Foreign port: 38216

---

```

Nexthop: 172.16.39.1
Nexthop global: 2011::2
Nexthop local: fe80::251:82ff:fe11:2201
BGP connection: non shared network
Read thread: on Write thread: off

```

---

### Related Commands

*router*

## show bridge

### show bridge

```

spanning-tree active | bridge | detail | interface ethernet <1-2>. <1-4000> | mst
<WORD> configuration | detail | interface <1-2> | root |
[<filter/redirection options>]}

```

Syntax Description	show bridge
[spanning-tree active   bridge   detail   interface ethernet <1-2>. <1-4000>   mst <WORD> configuration   detail   interface <1-2>   root	Shows list of bridges and spanning-tree information.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Modes</b>	show bridge

### Usage Guidelines

Use this command to list bridge and spanning tree information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays bridge information.

```
show bridge
```

### Related Commands

*bridge*

## show cellular

### show cellular

```
{cellular <0-0> all |
```

**connection** |  
**hardware** |  
**network**] **profile** <NAME> | **radio** | **security** | **sms-log** |

**Syntax Description**

**show cellular**

{ <b>cellular interface</b> <0-0>	Displays all information.
<b>connection</b>	Displays current active connections.
<b>hardware</b>	Displays cellular modem information.
<b>network</b>	Displays cellular network information.
<b>profile</b> <NAME>	Displays profile information about the modem.
<b>radio</b>	Displays cellular modem radio information.
<b>security</b>	Displays modem security status.
<b>sms-log</b>	Displays SMS log.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>

**Command Modes**

Perle#show cellular

### Usage Guidelines

Displays information about your cellular connection.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

```
Perle#show cellular 0 profile
```

```
-----  
Connection Information  
=====
```

```
Cellular Status:  Data connected  
IP Address:      25.110.104.191  
IPv6 Address:    ::  
Connection Duration: 21 mins 7 secs
```

```
-----  
Data Usage:      5.14 GB  
Hardware Information  
=====
```

```
Firmware Version: 03.017(01.000.05)  
Active Firmware:  "SIM-Select"  
Device Model ID:  PLS8-X  
IMEI:             359073061841023  
Modem Temperature: 37 deg C
```

---

**SIM 1**

Card Detected: Yes  
 ICCID: 89312720523049569464  
 IMSI: 302720709109402  
 Phone #: Not available

**Network Information**

=====

Network Status: Registered. Home network.  
 Connected Network: "ROGERS" (MCC:MNC=302:720)

**Profile Information**

=====

Active Profile: Primary (test1)  
 Connected APN: "lteinternet.apn"

**Radio Information**

=====

Radio Technology: LTE  
 Signal Strength: -62 dBm

**Modem Security Information**

=====

Active SIM 1  
 SIM Locked: No  
 PIN retry: 5  
 PUK Retry: 10

---

**Related Commands**

*cellular*

**show clock**

See *show clock*

**show crypto**

See *show crypto*

**show debugging****show debugging**

{**debugging** |  
 [*<filter/redirection options>*]}

---

**Syntax Description****show debugging**

{**debugging** |

Displays processes that are in debugging mode.

[*<filter/redirection options>*]}

Output modifiers see

*Show Command Filtering and Redirection*

---

<b>Command Modes</b>	show debugging
----------------------	----------------

---

**Usage Guidelines**

Use this command to show which functions or commands have debug enabled.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

This example displays the debug command output.

```
show debugging
BGP events debugging is on
NTP debugging is on
```

---

*debug*

**show dhcp****show dhcp**

```
{lease |
[<filter/redirection options>]}
```

---

<b>Syntax Description</b>	<b>show dhcp</b>
---------------------------	------------------

---

{lease	Displays current devices with leases.
--------	---------------------------------------

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	---

---

<b>Command Modes</b>	show dhcp lease
----------------------	-----------------

---

**Usage Guidelines**

Use this command to display all client dhcp leases with configured options.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

This example displays all dhcp leases.

```
show dhcp lease
dhcp-assigned-address 172.17.121.182
option subnet mask 255.255.0.0
option dhcp-lease time 86400 seconds
option dhcp-server-identifier 172.17.3.13
renew Mon Jan 01 08:44:00 EST 2021
rebind Mon Jan 01 19:02:16 EST 2021
expire Mon Jan 01 22:02:16 EST 2021
```

---

**Related Commands***show ip dhcp***show dot1x**See *show eap***show eap**See *show eap***show eee****show eee**

```
{capabilities interface ethernet 2 |
status interface ethernet 2 |
[<filter/redirection options>]}
```

---

**Syntax Description****show eee**

```
{eee capabilities interface
ethernet 2 |
```

Displays whether the remote Ethernet interface is capable of Energy Efficient Ethernet (EEE).

```
status ethernet 2 |
```

Displays the current status.

- Disagree—the remote interface cannot negotiate EEE
- Link down—the remote interface is not connected
- Operational—both sides have agreed on EEE capabilities
- Disabled—EEE is disabled on this Ethernet interface

```
[<filter/redirection options>]}
```

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

show eee

---

**Usage Guidelines**

Use this command to display Ethernet EEE port capabilities.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.



---

**Examples**

This example displays EEE capabilities on the Ethernet ports.

```
show eee capabilities
Ethernet1
  EEE: no
Ethernet2
  EEE: yes
```

**show email****show email**

*[<filter/redirection options>]*

**Syntax Description****show email**

**{email}** |

Displays email configuration.

*[<filter/redirection options>]*

Output modifiers see

*Show Command Filtering and Redirection*

**Command Modes**

show email

**Usage Guidelines**

Use this command to display configured email parameters.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

This example displays email configuration.

```
show email
Email: Enabled
SMTP Server: 172.217.214.109:587
From: tfelton@gmail.com
Encryption: tls
Username: tfelton@gmail.com
Password: OHJJd0ll564ggbTzMI
```

---

Validate Certificate: Disabled

Email Notifications:

Recipient                      Notifications

Subject

tfelton@perle.com              alarms authentication entity envmon snmp ipsec

Tom's events fromIOLAN

---

**Related Commands**

*email*

---

## show environment

See *show environment*

## show facility-alarm

See *show facility-alarm*

## show flash:

See *show flash:*

## show format

### show format

[<filter/redirection options>]}

---

#### Syntax Description

#### show format

---

[<filter/redirection options>]}

Output modifiers see

*Show Command Filtering and Redirection*

---

#### Command Modes

format

---

#### Usage Guidelines

Use this command to list supported CLI show format commands.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

#### Examples

This example displays the supported CLI show format commands.

```
show format
show aaa local user lockout
show alarm profile
show alarm profile %s
show alarm settings
show alarm settings enabled
show archive
show archive config rollback timer
show archive update-sw
show arp
-----
show arp
show bgp memory
.....
```

## show hosts

See *show hosts*

## show interfaces

### show interfaces

{interfaces bvi <1-9999> |  
cellular <0-0> |

**dialer** <0-15> |  
**dot11radio** <0-4> |  
**ethernet 2** [vrrp <1-255>] [description <WORD>] |  
**loopback counters** | **description** | **stats** | **summary** |  
**openvpn-tunnel** <0-999> |  
**tunnel** <0-999> |  
**counters** |  
**description** |  
**stats** |  
**summary** |  
**vrrp** <1-255> **counters** | **description** | **stats** | **summary** |  
 [<filter/redirection options>]}

Syntax	Description	show interfaces
{ <b>interfaces bvi</b> <1-9999>		Displays Bridge-Group Virtual interfaces.
<b>cellular</b> <0-0>		Displays Cellular WAN interfaces.
<b>dialer</b> <0-15>		Displays Dialer interfaces.
<b>dot11radio</b> <0-4>		Displays IEEE 802.3z interfaces.
<b>ethernet 2</b> [vrrp <1-255>] [description <WORD>]		Displays Ethernet interfaces.
<b>loopback counters</b>   <b>description</b>   <b>stats</b>   <b>summary</b>		Displays loopback interface.
<b>openvpn-tunnel</b> <0-999>		Displays OpenVPN interfaces.
<b>tunnel</b> <0-999>		Displays tunnels.
<b>counters</b>		Displays counters for all interfaces.
<b>description</b>		Displays descriptions for all interfaces.
<b>stats</b>		Displays stats for all interfaces.
<b>summary</b>		Displays summary for all interfaces.
<b>vrrp</b> <1-255> <b>counters</b>   <b>description</b>   <b>stats</b>   <b>summary</b>		Displays summary for vrrp.
[<filter/redirection options>]}		Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>		show interfaces

---

## Usage Guidelines

Use this command to display interface details, including admin statuses, and link statuses.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

## Examples

This example shows interface descriptions.

show interfaces description

Interface	Admin Status	Link Status	Description
lo	up	up	
eth1	up	up	
eth1.2	up	up	
eth1.10	up	up	
eth1.100	up	up	
eth1.200	up	up	
eth2	up	down	
eth2.100	up	down	
eth2.200	up	down	
eth2.400	up	down	
wlan0	up	down	lynradio
wlan1	up	up	
wlan3	up	up	
wlan4	up	up	
wlm0	up	up	
br10	up	down	
tun1	up	up	
tun2	up	up	
tun10	up	up	
vtun1	admin down	down	

---

## Related Commands

*(config-if)#bvi*

*(config-if)#dialer*

*(config-if)#ethernet*

*(config-if)#tunnel*

*(config-if)#openvpn-tunnel*

## show ip access-lists

**show ip access-lists**

{**extended** <100-199> <2000-2699> | **standard** <1-99> <2000-2699> |  
[<filter/redirection options>]}

---

**Syntax Description**

**show ip access-lists**

{**extended** <100-199> <2000-2699> | **standard** <1-99> <2000-2699> |

Displays Extended and standard IP access lists.

[<filter/redirection options>]}

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

show ip access-lists

---

**Usage Guidelines**

Use this command to display configured access lists.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

```
show ip access-lists
Extended IP access list 100
10 permit any any
```

---

**Related Commands**

*ip access-list*

**show ip alg**

```
show ip alg {table |
[<filter/redirection options>]}
```

---

**Syntax Description****show ip alg**

{table |

Displays ALG entries.

[<filter/redirection options>]}

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

show ip alg table

---

**Usage Guidelines**

Use this command to display Application Level Gateway (ALG) entries.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

---

**Examples**

This example displays ip alg table information.

```
show ip alg table
```

```
CONN-ID      Source          Destination      Protocol  Timeout  State
843977664    192.168.4.1     224.0.0.18      unknown  [112]599
843977984    172.16.4.181:138 172.16.255.255:138  udp [17] 29
843978304    172.16.22.3:138 172.16.255.255:138  udp [17] 29
843978624    172.16.4.177:62992 255.255.255.255:62976  udp [17] 26
843808192    172.16.60.2:137 172.16.255.255:137  udp [17] 11
843807552    10.10.200.83:53864 172.16.78.229:23  tcp [6] 431999  ESTABLISHED
843977344    127.0.0.1:47292 127.0.0.1:13514  tcp [6] 431999  ESTABLISHED
843978944    127.0.0.1:57516 127.0.0.1:199  tcp [6] 431997  ESTABLISHED
843979264    127.0.0.1:57508 127.0.0.1:199  tcp [6] 431997  ESTABLISHED
843804992    172.16.23.124:17500 255.255.255.255:17500  udp [17] 2
843979584    172.16.27.68:17500 172.16.255.255:17500  udp [17] 29
843806912    172.16.78.229:123 68.69.221.61:123  udp [17] 10
843979904    172.16.27.68:17500 255.255.255.255:17500  udp [17] 29
683519104    10.10.200.11:50558 172.16.78.229:22  tcp [6] 431947  ESTABLISHED
843805632    172.16.21.1:137 172.16.255.255:137  udp [17] 1
843977024    172.16.4.182:2049 172.16.78.229:807  udp [17] 179
843807872    172.16.23.124:137 172.16.255.255:137  udp [17] 12
946298880    127.0.0.1:57510 127.0.0.1:199  tcp [6] 431997  ESTABLISHED
843805312    172.16.23.124:17500 172.16.255.255:17500  udp [17] 2
843980224    172.16.78.229:22 10.10.200.11:50512  tcp [6] 276  ESTABLISHED
843806592    172.16.28.22:137 172.16.255.255:137  udp [17] 6
```

## show ip arp

```
show ip arp {<A.B.C.D> |
[<filter/redirection options>]}
```

Syntax Description	show ip arp
{<A.B.C.D>	Displays the ARP entry for the specified IPv4 address.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Modes</b>	show ip arp

### Usage Guidelines

Use this command to display ARP table details.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

```
show ip arp
```

Address	HWtype	HWaddress	Flags Mask	Iface
172.16.113.20	ether	78:2B:cb:a5:b4:0c	CM	eth1

## show ip as-path-access-list

```
show ip as-path-access-list
[<filter/redirection options>]}
```

Syntax Description	show ip as-path-access-list
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Modes</b>	show ip as-path-access-list

### Usage Guidelines

Use this command to show as-path access list.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays as-path access list.BGP neighbors.

```
show as-path-access-list
AS path access JoeAS-Path
permit def
deny abc
```

---

**Related Commands***ip as-path***show ip bgp**

```

{<A.B.C.D>/nn <A.B.C.D> |
cidr-only |
community |
community-info|
community-list <1-500> | <WORD> exact-match |
dampened-paths |
filter-list <WORD> |
flap-statistics |
ipv4 unicast |
neighbours <A.B.C.D> <X:X:X:X::X> | advertised-routes | dampened-routes |
flap-statistics | prefix-count | [received prefix-filter] | received-routers | routes |
paths |
prefix-list <WORD> |
regexp <LINE> |
route-map <WORD> |
summary |
[<filter/redirection options>]}

```

Syntax Description	show ip bgp
{<A.B.C.D>/nn <A.B.C.D>	Displays BGP network routing table.
cidr-only	Displays only routes with non-natural netmasks.
community	Displays routes matching the communities.
community-info	Displays all BGP community information.
community-list <1-500>   <WORD> exact-match	Displays routes matching the community list.
dampened-paths	Displays paths suppressed due to dampening.
filter-list <WORD>	Displays routes conforming to the filter list.
flap-statistics	Displays flap statistics of routes.
ipv4 unicast	Displays address family.

<b>neighbours</b> <A.B.C.D> <X:X:X:X::X>   <b>advertised-routes</b>   <b>dampened-routes</b>   <b>flap-statistics</b>   <b>prefix-count</b>   <b>[received prefix-filter]</b>   <b>received-routers</b>   <b>routes</b>	Displays detailed information on TCP and BGP neighbor connections.
<b>paths</b>	Displays path information.
<b>prefix-list</b> <WORD>	Displays routes matching the prefix list.
<b>regexp</b> <LINE>	Displays routes matching the AS path regular expression.
<b>route-map</b> <WORD>	Displays routes matching the route map.
<b>summary</b>	Displays the summary of BGP neighbor statuses.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Modes</b>	show ip bgp

### Usage Guidelines

Use this command to display BGP information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays BGP information.

```
show ip bgp
```

```
BGP table version is 0, local router ID is 172.16.113.215
```

```
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,  
r RIB-failure, S Stale, R Removed
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete
```

```

Network      Next Hop      Metric      LocPrf      Weight Path
*> 172.16.0.0  0.0.0.0      1           32768      i

```

```
Total number of prefixes 1
```

### Related Commands

[clear ip](#)

**show ip community-list**  
**show ip community-list** |



---

[<filter/redirection options>]}

---

<b>Syntax Description</b>	<b>show ip community-list</b>
---------------------------	-------------------------------

---

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	---

---

<b>Command Modes</b>	show ip community-list
----------------------	------------------------

---

### Usage Guidelines

Use this command to display IP community list information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example displays the community lists.

```
show ip community-list
Community (expanded) access list 100
permit 50
```

---

### Related Commands

*ip community-list*

## show ip ddns

See *show ip ddns*

## show ip dhcp

See *show ip dhcp*

## show ip dns

### show ip dns

[<filter/redirection options>]}

---

<b>Syntax Description</b>	<b>show ip dns</b>
---------------------------	--------------------

---

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	---

---

<b>Command Modes</b>	show ip dns
----------------------	-------------

---

### Usage Guidelines

Use this command to display IP DNS configuration and information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays all DNS settings.

```
show ip dns
```

---

IP DNS

=====

DNS Lookup Enabled

Listen Addresses:

192.168.0.1

Cache Size           10000

Ignore Host File     Off

Negative TTL         3600

No Name Servers Configured

---

**Related Commands**

[\*ip dns\*](#)

**show ip extcommunity-list**

**show ip extcommunity-list**

**[<filter/redirection options>]}**

---

**Syntax Description****show ip extcommunity-list**

**[<filter/redirection options>]}**

Output modifiers see

[\*Show Command Filtering and Redirection\*](#)

---

**Command Modes**

show ip extcommunity-list

---

**Usage Guidelines**

Use this command to display configured ip extcommunity lists.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays extcommunity lists.

```
show ip extcommunity-list
```

```
Extended community standard list 99
```

```
denyso0:0:1:30
```

---

**Related Commands**

[\*ip community-list\*](#)

## show ip firewall

```
show ip firewall {[<NAME>] |
[<filter/redirection options>]}
```

Syntax Description	show ip firewall
{[<NAME>]}	Displays firewall name.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
Command Modes	show ip firewall

### Usage Guidelines

Use this command to display IP firewall configuration.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays active firewalls.

```
show ip firewall
```

```
Active on
```

Rule	Packets	Bytes	Action	Proto	Source	Destination	Rule Specs
10	0	0	accept	ip	0.0.0.0/0	0.0.0.0/0	
/* firewall1-10 */							
10000	0	0	drop	ip	0.0.0.0/0	0.0.0.0/0	
/* firewall1-10000 default-action drop */							

### Related Commands

*ip firewall*

*clear ip*

## show ip health

```
show ip health
{[interfaces] |
[profiles] |
[status] |
[<filter/redirection options>]}
```

Syntax Description	show ip health
{[interfaces]   [profiles]   [status]	Displays health profile configuration.
[profiles]	Displays health profile configuration.
[status]	Displays health interfaces runtime status.

---

[<filter/redirection options>]}

Output modifiers see

*Show Command Filtering and Redirection*

---

### Command Modes

show ip health

---

### Usage Guidelines

Use this command to display health status for interfaces.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example displays health information for configured interfaces.

```
show ip health
```

IP Health Profiles and Tests Configuration:

```
=====
```

```
Profile Name : health-pro
```

```
Failure-count: 5
```

```
Success-count: 5
```

```
Test 10: Type: PING Response Timeout: 1
```

```
Target: 8.8.8.8
```

```
Profile Name : labhealth
```

```
Failure-count: 1
```

```
Success-count: 1
```

```
Profile Name : testit
```

```
Failure-count: 1
```

```
Success-count: 1
```

IP Interface Health-Profile Configuration:

```
=====
```

```
eth1 health-pro
```

IP Interfaces Health Status:

```
=====
```

```
Interface: eth1
```

```
Status: failed
```

```
Last Status Change: Sat Feb 20 08:05:12 2021
```

```
-Test: ping Target: 8.8.8.8
```

```
Last Interface Success: n/a
```

```
Last Interface Failure: 0s
```

```
# Interface Failure(s): 20178
```

---

### Related Commands

*(config-if)#dialer*

*(config-if)#bvi*

---

```
(config-if)#ethernet
(config-if)#openvpn-tunnel
(config-if)#tunnel
(config-if)#dot11radio
(config-if)#cellular
```

## show ip host-group

```
show ip host-group {[<WORD>] |
[<filter/redirection options>]}
```

Syntax Description	show ip host-group
{[<WORD>]	Displays IP host groups.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show ip host-group

### Usage Guidelines

Use this command to display IP host groups.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays host group tables.

```
show ip host-group test
```

Host list:

```
172.16.77.88
```

```
1:2:3:4::5
```

### Related Commands

*ip host-group*

## show ip http

```
show ip http
{[server status] |
[<filter/redirection options>]}
```

Syntax Description	show ip http
{[server status]	Displays HTTP server status.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>

---

<b>Command Modes</b>	show ip http
----------------------	--------------

---

**Usage Guidelines**

Use this command to show status of HTTP server.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

**Examples**

Shows status of HTTP server.

```
show ip http
Http server status: Enabled
HTTP server port : 80
User session idle timeout: 1440 seconds
HTTP secure server status: Enabled
HTTP secure server port: 443
```

**Related Commands**

*ip http*

**show ip interface**

See *show ip interface*

**show ip nat**

**show ip nat**

{**statistics** |  
**translations** |  
[<*filter/redirection options*>]}

**Syntax Description****show ip nat**

<b>{statistics  </b>	Displays the Network Address Translation (NAT) source statistics table.
<b>translations  </b>	Displays the pre-nat and post-nat translations. table.
<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <i>Show Command Filtering and Redirection</i>

**Command Modes**

show ip nat

**Usage Guidelines**

Use this command to display the 's Network Address Translation Table (NAT) statistics and translations.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Example**

This example displays IP NAT translations.

```
show ip nat translations
```

```
NAT Source Translations
```

Pre-NAT	Post-NAT	Prot	Timeout
192.168.30.1	10.10.200.229	tcp	431936
192.168.30.1	10.10.200.229	tcp	431936
192.168.30.1	10.10.200.229	tcp	431936
192.168.30.1	10.10.200.229	tcp	431935
192.168.30.1	10.10.200.229	tcp	431935
192.168.30.1	10.10.200.229	tcp	62
192.168.30.1	10.10.200.229	tcp	61
192.168.30.1	10.10.200.229	tcp	431995
192.168.30.1	10.10.200.229	tcp	431995
192.168.30.1	10.10.200.229	tcp	431995

```
NAT Destination Translations
```

Pre-NAT	Post-NAT	Prot	Timeout
10.10.200.229:2222	192.168.20.2:22	tcp	431825

---

**Related Commands**

*ip nat*

**show ip ospf**

```
show ip ospf
```

```
{[border-routers] |
[database] |
[interface] |
[neighbor] |
[route] |
[<filter/redirection options>]}
```

---

```
Syntax Description
```

```
show ip ospf
```

---

{[border-routers]	Displays border and boundary router information.
-------------------	--

---

[database]	Displays database summary.
------------	----------------------------

---

[interface]	Displays interface information.
-------------	---------------------------------

---

[neighbor]	Displays neighbor list.
------------	-------------------------

---

<b>[neighbor]  </b>	Displays OSPF routing table.
<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <i>Show Command Filtering and Redirection</i>

---

**Command Modes** show ip ospf

---

### Usage Guidelines

Use this command to show the OSPF routing processes.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

```
show ip ospf
OSPF Routing Process, Router ID: 172.16.39.2
Supports only single TOS (TOS0) routes
This implementation conforms to RFC2328
RFC1583Compatibility flag is disabled
Opaque Capability flag is disabled
Initial SPF scheduling delay 200 millise(s)
Minimum hold time between consecutive SPFs 1000 millise(s)
Maximum hold time between consecutive SPFs 10000 millise(s)
Hold time multiplier is currently 1
SPF algorithm last executed 7m53s ago
SPF timer is inactive
Refresh timer 10 secs
Number of external LSA 0. Checksum Sum 0x00000000
Number of opaque AS LSA 0. Checksum Sum 0x00000000
Number of areas attached to this router: 1
Area ID: 0.0.0.0 (Backbone)
  Number of interfaces in this area: Total: 1, Active: 1
  Number of fully adjacent neighbors in this area: 0
  Area has no authentication
  SPF algorithm executed 1 times
  Number of LSA 1
  Number of router LSA 1. Checksum Sum 0x00001e7a
  Number of network LSA 0. Checksum Sum 0x00000000
  Number of summary LSA 0. Checksum Sum 0x00000000
  Number of ASBR summary LSA 0. Checksum Sum 0x00000000
  Number of NSSA LSA 0. Checksum Sum 0x00000000
  Number of opaque link LSA 0. Checksum Sum 0x00000000
  Number of opaque area LSA 0. Checksum Sum 0x00000000
```

---

### Related Commands

*router*



**show ip prefix-list**

```
show ip prefix-list {[WORD] |
[<filter/redirection options>]}
```

Syntax Description	show ip prefix-list
{[WORD]	Displays prefix list name.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
Command Modes	show ip prefix-list

**Usage Guidelines**

Use this command to display prefix list table.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

This example shows the ip prefix list.

```
show ip prefix-list
ip prefix-list prefix-lab (for lab users)
seq 10 permit 172.17.0.0/16
```

**Related Commands**

[ip prefix-list](#)

**show ip rip**

```
show ip rip {[status] |
[<filter/redirection options>]}
```

Syntax Description	show ip rip status
{[status]	Displays RIP information.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
Command Modes	show ip rip status

**Usage Guidelines**

Use this command to display rip status information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example shows rip status information.

```
show ip rip
Routing Protocol is "rip"
Sending updates every 30 seconds with +/-50%, next due in 30 seconds
Timeout after 180 seconds, garbage collect after 120 seconds
Outgoing update filter list for all interface is not set
Incoming update filter list for all interface is not set
Default redistribution metric is 1
Redistributing:
Default version control: send version 2, receive any version
Interface      Send Recv Key-chain
Routing for Networks:
Routing Information Sources:
Gateway        BadPackets BadRoutes Distance Last Update
Distance: (default is 120)
```

**show ip route**

```
show ip route {[table <1-200>] |
[<filter/redirection options>]}
```

Syntax Description	show ip route
{[table <1-200>]	Displays ip routes or route table. Tables must be pre-defined by the user.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Default</b>	None
<b>Command Modes</b>	show ip route

**Usage Guidelines**

Use this command to show configured tables for ip routing.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

Shows ip route table entries.

```
show ip route
table:200
```

**Related Commands**

[ip route](#)

**show ip route-policy**

**show ip route-policy** {[<NAME>] |  
[<filter/redirection options>]}

Syntax Description	show ip route-policy
{[<NAME>]	Show ip routes or route table. Tables must be pre-defined by the user.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
Command Modes	show ip route-policy

**Usage Guidelines**

Use this command to display configured routing policies.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

**Examples**

Shows ip route policies table.

```
show ip route-policy
```

```
IPv4 Route-policy route1
```

```
Active on
```

Rule	Packets	Bytes	Action	Proto	Source	Destination	Rule
20	0	0	rtable-254	ip	0.0.0.0/0	0.0.0.0/0	
					/* route1-9999 */		
10000	0	0	accept	ip	0.0.0.0/0	0.0.0.0/0	
					/* route1-10000 default-action accept */		

**Related Commands**

[ip route-policy](#)

**show ip ssh**

**show ip ssh**  
[<filter/redirection options>]}

Syntax Description	show ip ssh
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
Command Modes	show ip ssh

---

**Usage Guidelines**

Shows configuration for ssh.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example shows ip ssh configuration.

```
show ip ssh
```

```
SSH version: 2
```

```
SSH server: Enabled
```

```
Authentication timeout: 120 seconds
```

```
Authentication retries: 3
```

```
SSH public key:
```

```
ssh-rsa
```

```
AAAAB3NzaC1yc2EAAAADAQABAAQACgAtvWaaM0CeMWOZV1H00sni2J8T  
alvSyysQGyBDIOAydaaKv1+s1lmj00FL2Boi3ke/SoKhvuLJQ+bMVFXD7kXw2fk7  
Mo8f8Dd/rOuuF4kE6hKV+LLI44kJKwCUC2w2m4L1IH8Zn8HuX89Qcv2oqPUdkBf  
1nelU3gc6gN4v1ckC069Tgg9hrhghCiBECCCYxmAJUhly4dQcPwO1DQ6Acp2p3  
W2RYdgUvRAIr8oLiVdrEvT7zZECpYgCMYWmfsTtUhv8yZpvNAhV9nRm5E93YI  
V2J15qlmIISGKn0iiLRW42xjQ4MT5XmWdIXj+NpuMIQRtFzyYPkR2H
```

---

**Related Commands**

*ip ssh*

**show ipv6**

See *show ipv6*

**show ldap**

See *show ldap*

**show license**

**show license**

[<filter/redirection options>]}

---

**Syntax Description****show ipv6**

[<filter/redirection options>]}

Output modifiers see

*Show Command Filtering and  
Redirection*

---

**Command Modes**

show license

---

**Usage Guidelines**

Use this command to display the GNU license information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

## show line

### show line

```
{[console <0-0>] |
tty 48 [modbus statistics master-tcp | master-udp | slave-tcp | slave-udp] |
multihost | packet-forwarding | ppp | rlogin-client | settings | slip | ssh-client | ssl |
statistics | telnet-client | udp | vmodem] |
[<filter/redirection options>]}
```

#### Syntax Description

#### show line

{[console <0-0>] | Displays configured console parameters.

tty 48 [modbus statistics Displays statistics for tty lines.  
 master-tcp | master-udp |  
 slave-tcp | slave-udp] |  
 multihost | packet-forwarding  
 | ppp | rlogin-client | settings |  
 slip | ssh-client | ssl | statistics |  
 telnet-client | udp | vmodem] |

[<filter/redirection options>} Output modifiers see  
[Show Command Filtering and Redirection](#)

#### Command Modes

show line

#### Usage Guidelines

Use this command to display various line related configurations.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

Show line parameters for tty1.

show line tty 1

```

TTY
Service                reverse raw
  Port                 10001
  Multihost            none
Break                  Off
Break Delay            0
Break Length           0
Connection Method      direct connect
Data Logging           Off
Dial Retries           0
Dial Timeouts          0
Discard Characters     0
Received with Error    Off
Echo Suppression       Off
Hotkey Prefix          0
Idle Timer             0
Interface              eia-232
Initiate Connection    any
Initiate Char          0
address 0
Internet Address
Keepalive              Off
Line Name
Line Termination       On
Lock                   Off
Map CR to CRLF         Off
Modem Init String
Monitor DCD            Off
Monitor DSR_DTR        Off
MOTD                   Off
Multisessions          0
Pages                  0
Phone Number
Reset                  Off
Rev Sess Session       Off
RTS Toggle             Off
RTS Toggle Initial Delay 0
RTS Toggle Final Delay 0
Send Name              Off
Send Port ID           Off
Session Strings
  Initiate
  Terminate
  Delay                0
Terminal               dumb
Tx Driver Control      auto
User

```

**show lldp**See [show lldp](#)**show logging****show logging****[<filter/redirection options>]}**

---

**Syntax Description****show logging****[<filter/redirection options>]}**

Output modifiers see

[Show Command Filtering and Redirection](#)

---

**Command Modes**

show logging

---

### Usage Guidelines

Use this command to display the logging buffer.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example shows the logging buffer.

```
show logging
```

```
Syslog logging: enabled (764643 messages processed, 0 messages rate-limited, 0
overruns)
```

```
  Console logging: level debugging, 71 messages logged
```

```
  Monitor logging: level debugging, 71 messages logged
```

```
  Logging to:
```

```
  Buffer logging: level debugging, 1344 messages logged
```

```
  File logging: disabled
```

```
  Trap logging: level informational
```

```
  Logging Source-Interface:
```

```
Log Buffer (16384 bytes):
```

```
Sep 26 20:51:57 %REQHANDLERD-6: CONSOLE: initializing usb serial console
mode
```

```
Sep 26 20:52:02 %IPSEC_STARTER-6: Starting strongSwan 5.6.2 IPsec [starter]...
```

```
Sep 26 20:52:02 %IPSEC_STARTER-6: charon is already running
(/var/run/charon.pid exists) -- skipping daemon start
```

---

### Related Commands

[logging](#)

### show mab

See [show mab](#)

### show mac

See [show mac](#)

### show management-access

**show management-access**

**[<filter/ redirection options>]}**

---

Syntax	Description
--------	-------------

Syntax	Description
--------	-------------

[<filter/ redirection options>]}
----------------------------------

Output modifiers see
----------------------

<a href="#">Show Command Filtering and Redirection</a>
--

---

Command Modes
---------------

show management-access
------------------------

---

### Usage Guidelines

Use this command to display management access and access restrictions from the LAN and WAN side.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Examples

This example shows management access methods for LAN/WAN and TRUSTED interfaces.

```
show management-access
```

```
Management Access is disable
LAN:  eth1 eth1.2 eth1.10 eth1.100 eth1.200 eth2.400 wlan0 wlan1 wlan3 wlan4 br10
      HTTP  HTTPS  TELNET  SSH      SNMP      HTTP-RESTFUL  HTTPS-RESTFUL
      ENABLE  ENABLE  ENABLE  ENABLE   ENABLE    ENABLE         ENABLE
WAN:  wlm0 pppoe0 pppoe5 pppoe10
      HTTP  HTTPS  TELNET  SSH      SNMP      HTTP-RESTFUL  HTTPS-RESTFUL
      DISABLE  DISABLE  DISABLE  DISABLE  DISABLE   DISABLE       DISABLE
TRUSTED: tun10
        HTTP  HTTPS  TELNET  SSH      SNMP      HTTP-RESTFUL  HTTPS-RESTFUL
        ENABLE  ENABLE  ENABLE  ENABLE   ENABLE    ENABLE         ENABLE
```

---

### Related Commands

[\(management-access-LAN\)](#)

[\(management-access-WAN\)](#)

## show nat66

```
show nat66
```

```
{prefix |
statistics |
[<filter/redirection options>]}
```

---

### Syntax Description

### show nat66

---

{prefix	Display NAT66 prefixes.
---------	-------------------------

---

statistics	Display NAT66 statistics.
------------	---------------------------

---

[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
---------------------------------	--

---

### Command Modes

show nat66

---

### Usage Guidelines

Use this command to display Network Address Translations (NAT) for IPv6 networks.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.



---

**Examples**

This example shows NAT66 statistics

```
show nat66 statistics
```

```
Global Stats:
```

```
  ID:0
```

```
  Packets translated In -> Out
```

```
  1290003
```

```
  Packets translate Out -> In
```

```
  1290003
```

**show network-watchdog****show network-watchdog**

```
[<filter/redirection options>]}}
```

---

**Syntax Description****show network-watchdog**

---

```
[<filter/redirection options>]}
```

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

show network-watchdog

---

**Usage Guidelines**

Use this command to display network watchdog status and configuration.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example shows network-watchdog.

```
show network-watchdog
```

```
Network Watchdog Configuration/Status:
```

```
=====
```

---

```
Network-watchdog Router
```

```
  Configuration:
```

```
    Watchdog: Enable
```

```
    Target: 172.16.23.100
```

```
    Interface: eth1
```

```
    Interval: 1m
```

```
    Threshold: 2
```

```
Ping Count: 1
```

```
  Ping Timeout: 2s
```

```
  Fail Action: notification-only
```

```
  Test Status:
```

```
Total Success Count: 10 Since last reset Success Count: 9
```

```
Total Failed Count: 1 Failed Tests 1/2 Next Test 0:0 (Min:sec)
```

```
Reset Count: 1
```

---

**Related Commands***network-watchdog***show ntp**See *show ntp***show nvram:**See *show nvram:***show policy-map****{incoming |  
queueing |  
[<filter/redirection options>]}**

---

**Syntax Description****show ntp****{incoming |**

Displays input-policy information.

**queueing |**

Displays queuing information.

**[<filter/redirection options>]}**

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

show policy-map

---

**Usage Guidelines**

Use this command to display configured policy maps.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**show policy-map incoming  
Interface action Received Dropped Overlimit  
eth0 limiter 32 10 0  
eth2 redirect 64 0 0

---

**Related Commands***policy-map***show processes****show processes****[<filter/redirection options>]}**

---

**Syntax Description****show processes**

---

[<filter/redirection options>]}

Output modifiers see

[Show Command Filtering and Redirection](#)


---

### Command Modes

show processes

---

### Usage Guidelines

Use this command to display processes running on your IOLAN

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### show processes

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.0	0.6	92356	6280	?	SS	Mar15	0:09	/sbin/init
root	2	0.0	0.0	0	0	?	S	Mar15	0:00	[kthreadd]
root	4	0.0	0.0	0	0	?	I<	Mar15	0:00	[kworker/0:0H]
root	6	0.0	0.0	0	0	?	I<	Mar15	0:00	[mm_percpu_wq]
root	7	0.0	0.0	0	0	?	S	Mar15	0:06	[ksoftirqd/0]
root	8	0.4	0.0	0	0	?	I	Mar15	0:59	[rcu_preempt]
root	9	0.0	0.0	0	0	?	I	Mar15	0:00	[rcu_sched]
root	10	0.0	0.0	0	0	?	I	Mar15	0:00	[rcu_bh]
root	11	0.0	0.0	0	0	?	S	Mar15	0:00	[migration/0]
root	12	0.0	0.0	0	0	?	S	Mar15	0:00	[cpuhp/0]
root	13	0.0	0.0	0	0	?	S	Mar15	0:00	[cpuhp/1]
root	14	0.0	0.0	0	0	?	S	Mar15	0:00	[migration/1]
root	15	0.0	0.0	0	0	?	S	Mar15	0:01	[ksoftirqd/1]
root	17	0.0	0.0	0	0	?	I<	Mar15	0:00	[kworker/1:0H]
root	18	0.0	0.0	0	0	?	S	Mar15	0:00	[kdevtmpfs]
root	19	0.0	0.0	0	0	?	I<	Mar15	0:00	[netns]
root	22	0.0	0.0	0	0	?	S	Mar15	0:00	[khungtaskd]
root	23	0.0	0.0	0	0	?	S	Mar15	0:00	[oom_reaper]
root	24	0.0	0.0	0	0	?	I<	Mar15	0:00	[writeback]
root	25	0.0	0.0	0	0	?	S	Mar15	0:00	[kcompactd0]
root	26	0.0	0.0	0	0	?	SN	Mar15	0:00	[ksmd]
root	27	0.0	0.0	0	0	?	SN	Mar15	0:00	[khugepaged]
root	28	0.0	0.0	0	0	?	I<	Mar15	0:00	[crypto]
root	29	0.0	0.0	0	0	?	I<	Mar15	0:00	[kintegrityd]
root	30	0.0	0.0	0	0	?	I<	Mar15	0:00	[kblockd]
root	31	0.0	0.0	0	0	?	I<	Mar15	0:00	[ata_sff]
root	32	0.0	0.0	0	0	?	I<	Mar15	0:00	[a3700_otg_queue]
root	33	0.0	0.0	0	0	?	I<	Mar15	0:00	[md]
root	34	0.0	0.0	0	0	?	I<	Mar15	0:00	[watchdogd]
root	35	0.0	0.0	0	0	?	I<	Mar15	0:00	[rpciod]
root	36	0.0	0.0	0	0	?	I<	Mar15	0:00	[xpriod]
root	73	0.0	0.0	0	0	?	S	Mar15	0:00	[kauditd]
root	74	0.0	0.0	0	0	?	S	Mar15	0:00	[kswapd0]
root	75	0.0	0.0	0	0	?	I<	Mar15	0:00	[nfsiod]
root	91	0.0	0.0	0	0	?	I<	Mar15	0:00	[kthrotld]
root	92	0.0	0.0	0	0	?	I<	Mar15	0:00	[perle_genl_work]
root	93	0.0	0.0	0	0	?	I<	Mar15	0:00	[perle_genl_irq_]
root	95	0.0	0.0	0	0	?	I<	Mar15	0:00	[nvme-wq]
root	96	0.0	0.0	0	0	?	S	Mar15	0:00	[spi0]
root	97	0.0	0.0	0	0	?	S	Mar15	0:00	[xrm1280]
root	98	0.0	0.0	0	0	?	S	Mar15	0:00	[irq/58-spi0.0]
root	99	0.0	0.0	0	0	?	S	Mar15	0:00	[xrm1280]
root	100	0.0	0.0	0	0	?	S	Mar15	0:00	[irq/59-spi0.1]

.....

## show radius

See [show radius](#)

## show reload

### show reload

---

[<filter/redirection options>]}

---

### Syntax Description

### show reload

---

[<filter/redirection options>]}

Output modifiers see

[Show Command Filtering and Redirection](#)


---

### Command Modes

#show reload

---

**Usage Guidelines**

Use this command to display scheduled IOLAN reloads or reboots.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example show configured reloads.

```
show reload
```

```
Reload scheduled for 18:00:00 EDT Oct 17 2019 (in 59 minutes)
```

---

**Related Commands**

*reload*

**show rest-api****show rest-api**

```
{jwt | server status |  
[<filter/redirection options>]}
```

---

**Syntax Description****show reload**

```
{jwt | server status |
```

Show RESTful API information.

```
[<filter/redirection options>]}
```

Output modifiers see

*Show Command Filtering and Redirection*

---

**Command Modes**

#show rest-api

---

**Usage Guidelines**

Use this command to display RESTful API information.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays RESTful API information.

```
show rest-api server status
```

```
RESTful API HTTP server status: Disabled
```

```
RESTful API HTTP server port: 8080
```

```
Cookie maximum age timeout: 1440 seconds
```

```
RESTful API HTTPS server status: Disabled
```

```
RESTful API HTTPS server port: 8443
```

---

**Related Commands**

*remote-management*

**show route-map**

**show route-map** {[<WORD>] |  
[<filter/redirection options>]}

Syntax Description	show route-map
{<WORD>	Displays specified route map.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
Command Modes	show route-map

**Usage Guidelines**

Use this command to display route map information.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

**Example**

Shows route map details.

```
show route-map route1
```

RIB:

```
route-map route1, permit, sequence 2
```

```
Match clauses:
```

```
Set clauses:
```

```
Call clause:
```

```
Action:
```

```
Exit routemap
```

RIP:

```
route-map route1, permit, sequence 2
```

```
Match clauses:
```

```
Set clauses:
```

```
Call clause:
```

```
Action:
```

```
Exit routemap
```

---

```

RIPV6:
route-map route1, permit, sequence 2
  Match clauses:
  Set clauses:
  Call clause:
  Action:
    Exit routemap
OSPF:
route-map route1, permit, sequence 2
  Match clauses:
  Set clauses:
  Call clause:
  Action:
    Exit routemap
OSPF6:
route-map route1, permit, sequence 2
  Match clauses:
  Set clauses:
  Call clause:
  Action:
    Exit routemap
BGP:
route-map route1, permit, since
  Match clauses:
  Set clauses:
  Call clause:
  Action: Exit routemap

```

---

### Related Commands

*router*

## show running-config

**show running-config**

```
{[all] |
[<filter/redirection options>]}
```

Syntax	Description	show running-config
{[all]		Displays all config including defaults.
[<filter/redirection options>]}		Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>		show running-config

---

**Usage Guidelines**

Use this command to display the IOLAN's current running config. To make this configuration permanent you must copy running config to startup config.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Related Commands**

*show startup-config*

**show sdm****show sdm**

{**prefer** |  
[<*filter/redirection options*>]}

Syntax Description	show sdm
{ <b>prefer</b>	Displays the value for sdm.
[< <i>filter/redirection options</i> >]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Default</b>	Both IPv4 and IPv6
<b>Command Modes</b>	show sdm

---

**Usage Guidelines**

Use this command to display IPv4/IPv6 protocols running on your IOLAN

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

**Examples**

This example displays the current value for sdm.

```
show sdm prefer
```

The current template is 'dual-ipv4-and-ipv6 default template'

---

**Related Command**

*sdm*

**show serial****show serial**

{**advanced** |  
[**modbus gateway**] |  
[**port-buffering**] |  
[**trueport remap**] |

[username] <WORD> |  
 [vmodem | vmodem-phone] |  
 [<filter/redirection options>]}

Syntax Description	show serial
{advanced}	Displays advanced configuration.
[modbus gateway]	Displays modbus configuration.
[port-buffering]	Displays port buffering information.
[trueport remap]	Displays Trueport configuration.
[username] <WORD>	Displays user configuration for serial port.
[vmodem   vmodem-phone]	Displays virtual modem phone number.
[<filter/redirection options>]}	Output modifiers see <a href="#">Show Command Filtering and Redirection</a>
<b>Command Modes</b>	show serial

### Usage Guidelines

Use this command to view serial configuration.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays the advanced configuration for serial.

```
show serial advanced
Process Break Signals      off
Flush on Close             off
Single Telnet              off
Data Logging Buffer Size    4K
Monitor Connection Interval 180 Seconds
Monitor Connection Number of Retries 5
Monitor Connection Retry Timeout 5 Seconds
```

### Related Command

[serial](#)

## show snmp

show snmp  
 {community} |  
 [contact] |  
 [engine-id] |



**[group]** |  
**[host]** |  
**[location]** |  
**[mib ifmib ifindex ]** |  
**[user]** |  
**[view]** |  
**[<filter/ redirection options>]}**

Syntax	Description	show snmp
{ <b>community</b>		Displays community name.
<b>[contact]</b>		Displays contact information
<b>[engine-id]</b>		Displays SNMP engine-id.
<b>[group]</b>		Displays SNMP groups.
<b>[host]</b>		Displays host information
<b>[location]</b>		Displays location information.
<b>[mib ifmib ifindex ]</b>		Displays SNMP ifmib information.
<b>[user]</b>		Displays SNMP users.
<b>[view]</b>		Displays SNMP views.
<b>[&lt;filter/ redirection options&gt;]}</b>		Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>		show snmp

### Usage Guidelines

Use this command to display SNMP configured options.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example show the configured options for SNMP.

```

show snmp view
View name: IOLAN-view
include: iso, exclude

```

### Related Commands

*snmp-server*

## show ssh

See *show ssh*

## show startup-config

### show startup-config

[<filter/redirection options>]}

Syntax Description	show startup-config
{[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show startup-config

### Usage Guidelines

Use this command to display IOLAN startup configuration. This is the configuration which is used when the device is first powered up or re-booted.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Related Commands

*show running-config*

## show system

### show system

{[hardware] |  
[statuses] |  
[uptime] |  
[versions] |  
[<filter/redirection options>]}

Syntax Description	show system
{[hardware]	Displays hardware details.
[statuses]	Displays system statuses for alarms, memory, flash etc:
[uptime]	Displays IOLAN's uptime.
[versions]	Displays IOLAN's software versions.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show system

---

**Usage Guidelines**

Use this command to displays information about software versions.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

This is a sample of the type of information presented. The specific information displayed on your system is model Dependant.

show system statuses

System Statuses:

System Up Time..... 7

---

hours 26 minutes 4 seconds

System Date and Time (local time zone)..... 2019-12-10 18:02:18

Startup-Configuration state..... In

Sync with

Running-configuration

System Statuses:

System Up Time..... 7 hours 26 minutes 4 seconds

System Date and Time (local time zone)..... 2019-12-10 18:02:18

Startup-Configuration state..... In Sync with

Running-configuration

CPU Utilization..... 4.55

Memory (kBytes free)..... 55420

Flashdisk (Mbytes free)..... 1008

**show tacacs**

See [show tacacs](#)

**show task-status**

**show task-status**

{ [*<filter/redirection options>*] }

---

**Syntax Description**

**show task-status**

{ [*<filter/redirection options>*] }

Output modifiers see

[Show Command Filtering and Redirection](#)

---

**Command Modes**

show task-status

---

## Usage Guidelines

Use this command to display system running tasks.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

---

## Examples

show task-status

```
top - 22:28:58 up 4:15, 0 users, load average: 0.04, 0.10, 0.18
Tasks: 158 total, 1 running, 108 sleeping, 0 stopped, 0 zombie
%cpu(s): 2.9 us, 2.1 sy, 0.0 ni, 95.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem: 1014044 total, 975328 used, 38716 free, 107612 buffers
KiB Swap: 0 total, 0 used, 0 free. 412856 cached Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
20200	root	20	0	10284	3360	2940	R	6.0	0.3	0:00.08	top
1	root	20	0	92556	6212	3740	S	0.0	0.6	1:26.83	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kthreadd
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:+
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_+
7	root	20	0	0	0	0	S	0.0	0.0	0:01.02	ksoftirqd/0
8	root	20	0	0	0	0	I	0.0	0.0	0:14.45	rcu_preempt
9	root	20	0	0	0	0	I	0.0	0.0	0:00.30	rcu_sched
10	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_bh
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.09	migration/0
12	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
14	root	rt	0	0	0	0	S	0.0	0.0	0:00.08	migration/1
15	root	20	0	0	0	0	S	0.0	0.0	0:00.81	ksoftirqd/1
17	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:+
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
19	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
22	root	20	0	0	0	0	S	0.0	0.0	0:00.01	khungtaskd
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
24	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kcompactd0
26	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
27	root	39	19	0	0	0	S	0.0	0.0	0:00.46	khugepaged
28	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	crypto
29	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kernelintegrityd
30	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd
31	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	ata_sff

.....

## show tech-support

show tech-support

{[<filter/redirect options>]}

---

**Syntax Description**

**show tech-support**

{[<filter/redirect options>]}

Output modifiers see

[Show Command Filtering and Redirection](#)

---

**Command Modes**

show tech-support

---

## Usage Guidelines

Use this command to capture internal IOLAN information. It will capture a large range of information which you could send to Perle technical support to assist in resolving issues.

Output modifiers (Pipe redirect)—allows you to pipe the output to the redirect options as specified.

## show terminal

See *show terminal*

## show username

### show username

{[<WORD>] |  
[<filter/redirection options>]}

Syntax Description	show username
{[<WORD>]	Type the username to display.
[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show username

### Usage Guidelines

Use this command to display information about a user.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

```
#show username lyn
username      lyn
  privilegeLevel 15
  Password:      *****
  password created: Fri Sep 18 21:18:27 testtimezone 2020
  Two Factor    Disabled
```

### Related Commands

*username*  
*show users*

## show users

See *show users*

## show version

See *show version*

## show vrrp

### show vrrp

{interface |  
[status] |  
[<filter/redirection options>]}

Syntax Description	show vrrp
--------------------	-----------

---

<b>{[interface]  </b>	Displays VRRP information for specified interface.
<b>[status]  </b>	Displays VRRP statistics.
<b>[&lt;filter/redirection options&gt;]}</b>	See <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show vrrp

---

### Usage Guidelines

Use this command to display VRRP interface information and statistics.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays VRRP information on Ethernet interface 1.

```
show vrrp interface 1
Interface: eth1
-----
Group: 10
-----
State:  FAULT
Last transition: 12m23s

Priority: 100
Advertisement interval: 1000 milli-sec
Preempt:  enabled

VIP count: 1
172.16.44.55/16
```

### Related Commands

*vrrp*

## show wan

### show wan

```
{failover source-interface | status |wan-interface |
high-availability |
load-sharing rules | status |
<filter/redirection options>]}
```

### Syntax Description

### show wan

<b>{failover source-interface   status  wan-interface  </b>	Displays WAN source interface configuration and status.
---	---

---

<b>high-availability</b>	Displays WAN management.
<b>load-sharing rules   status</b>	Displays load sharing configuration and status.
<b>[&lt;filter/redirection options&gt;]}</b>	Output modifiers see <i>Show Command Filtering and Redirection</i>
<b>Command Modes</b>	show wan

---

### Usage Guidelines

Use this command to show wan configured features for fail over, high-availability and load sharing.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

### Examples

This example displays WAN management.

```
show wan high-availability
WAN High Availability
=====
Mode: DISABLED
```

```
WAN Failover Primary Active Interface:
=====
DISABLED
```

```
WAN Load Failover Interfaces Health Status:
=====
DISABLED
```

```
WAN Load Share Global Settings:
=====
Include Local Traffic:    enabled
Source IP NAT:           disabled
Track inbound Connections: enabled
Flush Connections on Failure: enabled
WAN Load Sharing Interfaces Health Status:
=====
DISABLED
```

### Related Commands

*wan*

**show zone-policy**  
**show zone-policy**

```
{zone <WORD> |
[<filter/redirection options>]}
```

---

<b>Syntax Description</b>	<b>show zone-policy</b>
---------------------------	-------------------------

---

{zone <WORD>	Displays specified zone policy.
--------------	---------------------------------

---

[<filter/redirection options>]}	Output modifiers see <i>Show Command Filtering and Redirection</i>
---------------------------------	---

---

<b>Command Modes</b>	show zone-policy
----------------------	------------------

---

### Usage Guidelines

Use this command to show zone policy for the specified zone.

Output modifiers (Pipe redirect)—allows you to redirect the output to the options as specified.

---

### Related Commands

*zone-pair*

## shutdown

### shutdown

---

<b>Syntax Description</b>	<b>shutdown</b>
---------------------------	-----------------

---

{shutdown}	Shutdown the IOLAN. The Reset button brings system backup.
------------	--

---

<b>Command Modes</b>	shutdown
----------------------	----------

---

### Usage Guidelines

Use this command to shutdown the IOLAN.

## ssh

See *ssh*

## telnet

See *telnet*

## terminal

See *terminal*

## testemail

See *testemail*

## testsms

See *traceroute*



## traceroute

See [traceroute](#)

## undebug

undebug  
 {alarmgr |  
 all |  
 bgp |  
 bridge spanning-tree packet |  
 cellular-gnss |  
 cellular-lte |  
 clpd |  
 dialer |  
 dot11-ap |  
 dot11-station |  
 dot1x-authenticator |  
 dot11-supPLICANT |  
 drmgrd |  
 email |  
 init |  
 ip |  
 ipsec |  
 kernel |  
 lldp |  
 logging |  
 ntp |  
 rest-api |  
 snmp |  
 trapmgr |  
 tty |  
 vrrp |  
 vty |  
 wan-highavail |  
 wanifmgr }

Syntax	Description	undebug
{alarmgr		Turns off alarmgr debug.
all		Turns all debug off.
bgp		Turns off BGP debug.
bridge spanning-tree packet		Turns off bridge spanning-tree debug.

---

	Turns off cellular-gnss debug.
	Turns off cellular debug.
<b>clpd</b>	Turns off clpd debug.
<b>dialer</b>	Turns off dialer debug.
	Turns off dot11-ap debug.
	Turns off dot11 station debug.
<b>dot1x-authenticator</b>	Turns off dot1x authenticator debug.
<b>dot11-supplicant</b>	Turns off dot1x debug.
<b>drmgrd</b>	Turns off drmgrd debug.
<b>email</b>	Turns off email debug.
<b>init</b>	Turns off init process debug.
<b>ip</b>	Turns off ip process debug.
<b>ipsec</b>	Turns off IPsec debug.
<b>kernel</b>	Turns off kernel debug.
<b>lldp</b>	Turns off LLDP debug.
<b>logging</b>	Turns off logging debug.
<b>ntp</b>	Turns off NTP debug.
<b>rest-api</b>	Turns off RESTful API debug.
<b>snmp</b>	Turns off SNMP debug.
<b>trapmgr</b>	Turns off trapmgr debug.
<b>tty</b>	Turns off tty debug.
<b>vrrp</b>	Turns off VRRP debug.
<b>vty</b>	Turns off vty debug.
<b>wan-highavail</b>	Turns off wan-highavail debug.
<b>wanifmgr</b> }	Turns off wanifmgr debug.
<b>Command Modes</b>	undebug

---

---

**Usage Guidelines**

Use this command to turn debugging mode off for a process.

---

**Examples**

This example turns off debugging for alarmmgr.

```
undebug alarmgr
```

Alarm Manager debugging is off

---

**Related Commands**

*debug*

*password*

*traceroute*

**vrrp****vrrp {restart}**

---

**Syntax Description****vrrp**

---

**{restart}**

Restart VRRP process.

---

**Command Modes**

vrrp

---

**Usage Guidelines**

Use this command to restart VRRP.

---

**Examples**

This example restarts VRRP.

```
restart vrrp
```

---

**Related Commands**

*show vrrp*

*vrrp*

# 4 Global Configuration Mode

This chapter defines all the CLI commands in Global Configuration Mode. Some CLI commands may not be applicable to your model or running software.

## aaa

### aaa

```
{[accounting dot1x default start-stop group <WORD> radius | tacacs] | [exec <WORD> | default none | start-stop broadcast | group |radius | tacacs | stop-only broadcast | group |radius | tacacs] | [system default none | start-stop] | authentication attempts login <1-25> | [dot1x default group <WORD> | radius] | [login <WORD> group <WORD> | ldap | local | none | radius | tacacs | default group <WORD> | group | ldap local | none | radius | tacacs] | [two-factor pin-attempts <1-10> | pin-size <4-6> | pi n-tries <1-10> | [wan-only off | on] | authorization [console] | [exec <WORD> | group <WORD> if-authenticated | local | none | radius | tacacs] | group server [ldap <WORD>] | [radius <WORD>] | [tacacs <WORD>] | local [authentication attempts max-fail <1-65535>] | [username min-len <1-32>] | [lockout-time <30-65535>] | password expiry <1-999> | pbkdf2 rounds <1000-100000000> | restriction enable | group [lower-case <1-5> | numeric <1-5> | special | upper-case <1-5> | max-len <1-128> | min-len <1-64> | reuse <1-32>]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	aaa
<pre>{[accounting dot1x default start-stop group &lt;WORD&gt; radius   tacacs]   [exec &lt;WORD&gt;   default none   start-stop broadcast   group  radius   tacacs   stop-only broadcast   group  radius   tacacs]   [system default none   start-stop]  </pre>	When AAA accounting is enabled, the IOLAN reports user activity to the TACACS+ or RADIUS security server (depending on which security method is selected) in the form of accounting records. This allows the AAA accounting feature to track the services that users are accessing and the amount of network resources that users are consuming. Each accounting record contains accounting attributes that are stored on the security server. This data can then be analyzed for network management, client billing, and auditing. If using groups a pre-defined group must have been previously created.
<pre>authentication attempts login &lt;1-25&gt;   [dot1x default group &lt;WORD&gt;   radius]   [login &lt;WORD&gt; group &lt;WORD&gt;   ldap   local   none   radius   tacacs   default</pre>	Configure authentication parameters. Authentication verifies users before they are allowed access to the network and network services (which are verified with authorization).

<p><b>group</b> &lt;WORD&gt;   <b>group</b>   <b>ldap</b> <b>local</b>   <b>none</b>   <b>radius</b>   <b>tacacs</b>]   [<b>two-factor pin-attempts</b> &lt;1-10&gt;   <b>pin-size</b> &lt;4-6&gt;   <b>pin-tries</b> &lt;1-10&gt;   [<b>wan-only</b> <b>off</b>   <b>on</b>]  </p>	<p>The default method list is automatically applied to all interfaces except those that have a named method list explicitly defined. A defined method list overrides the default method list. The first listed method is used. If it fails to respond, the second one is used, and so on.</p> <p><b>Two factor</b> authentication parameters for pin attempts, size, and retries.</p>
<p><b>WAN-only</b></p> <p><b>Off</b>—admin users two-factor required for all connections</p> <p><b>On</b>—admin users two-factor only required for WAN connections</p>	
<p><b>authorization</b> [<b>console</b>]   [<b>exec</b> &lt;WORD&gt;   <b>group</b> &lt;WORD&gt; <b>if-authenticated</b>   <b>local</b>   <b>none</b>   <b>radius</b>   <b>tacacs</b>]  </p>	<p>Configure parameters for the authorization EXEC command. This determines if the user is allowed to run in EXEC mode. EXEC authorization applies to vty and tty lines. The first listed method is used. If it fails to respond, the second one is used, and so on.</p>
<p><b>group server</b> [<b>ldap</b> &lt;WORD&gt;]   [<b>radius</b> &lt;WORD&gt;]   [<b>tacacs</b> &lt;WORD&gt;]  </p>	<p>Configure a group server for LDAP, RADIUS or TACACS+.</p>
<p><b>local</b> [<b>authentication</b> <b>attempts</b> <b>max-fail</b> &lt;1-65535&gt;]   [<b>username</b> <b>min-len</b> &lt;1-32&gt;]   [<b>lockout-time</b> &lt;30-65535&gt;]  </p>	<p>Configure local user failed authentication attempts.</p> <p>Value is 1–65535 attempts</p> <p>Default is never lock the user out.</p> <p>FN router the default is 5 attempts, then the user is locked out for one hour.</p> <p>Configure the minimum length for user names. Values are 1 to 32</p> <p>Default is minimum length of 1.</p> <p>Lock out time is 30 to 65535 in minutes.</p>
<p><b>password</b> <b>expiry</b> &lt;1-999&gt;   <b>pbkdf2</b> <b>rounds</b> &lt;1000-100000000&gt;   <b>restriction</b> <b>enable</b>   <b>group</b> [<b>lower-case</b> &lt;1-5&gt;   <b>numeric</b> &lt;1-5&gt;   <b>special</b>   <b>upper-case</b> &lt;1-5&gt;   <b>max-len</b> &lt;1-128&gt;   <b>min-len</b> &lt;1-64&gt;   <b>reuse</b> &lt;1-32&gt;] }</p>	<p>Configure password restrictions.</p> <ul style="list-style-type: none"> <li>• Password cannot be the same as User name</li> <li>• Cannot have 3 consecutive characters in the same password</li> <li>• No password is not allowed</li> <li>• Special character are any non alphanumeric character</li> </ul>

- Minimum number of lowercase characters is 1–5
- Minimum number of lowercase numeric numbers is 1–5
- Minimum number of special characters is 1–5
- Minimum number of uppercase characters is 1–5
- Number of times a password can be changed before it can be reused.

Value is 1–32 times

pbkdf2 round default is 100000

The larger number of rounds, the more secure password hashing, however slower logins will occur.

---

### Command Modes

Perle(config)#aaa

---

### Usage Guidelines

Configure Authentication, Authorization, and Accounting parameters.

---

### Examples

This example generates start and stop accounting records.

```
Perle(config)#aaa accounting network default start-stop group radius
```

This example configures authentication and authorization to RADIUS as the first method to authenticate/authorize, then local database as the second method for all users.

```
Perle(config)#aaa authentication login default group radius local
```

```
Perle(config)#aaa authorization exec default group radius local
```

This example sets two-factor authentication attempts to 2.

```
Perle(config)#aaa authentication two-factor pin-attempt 2
```

---

### Related Commands

*show aaa*

*clear aaa*

*(config-ldap-server)*

*clear ldap*

*(config-sg-radius)*

*clear radius*

*(config-sg-tacacs)*

*clear tacacs*

*(config-user-2factor)*

**(config-sg-ldap)****{server name <WORD>}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-sg-ldap)#
<b>{server name &lt;WORD&gt;}</b>	Configure LDAP server name.
<b>Command Modes</b>	Perle(config-sg-ldap)#

**Usage Guidelines**

Use this command to configure LDAP server name.

**Examples**

This example configures the LDAP server name to LDAP1.

Perle(config-sg-ldap)#server name ldap1

**Related Commands***clear ldap**ldap**show ldap***(config-sg-radius)****{server name <WORD>}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-sg-radius)#
<b>{server name &lt;WORD&gt;}</b>	Configure RADIUS server name.
<b>Command Modes</b>	Perle(config-sg-radius)#

**Usage Guidelines**

Use this command to configure the RADIUS server name.

**Examples**

This example configures the RADIUS server name to RADIUS1.

Perle(config-sg-radius)#server name radius1

**Related Commands***clear radius**ip radius**show radius**(config-radius-server)*

**(config-sg-tacacs)****{server name <WORD>}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-sg-tacacs)#
<b>{server name &lt;WORD&gt;}</b>	Configure TACACS+ server name.
<b>Command Modes</b>	Perle(config-sg-tacacs)#

**Usage Guidelines**

Use this command to configure the TACACS+ server name.

**Examples**

This example configures the TACACS+ server name to TACACS1.

Perle(config-sg-radius)#server name tacacs1

**Related Commands***ip tacacs**tacacs**clear tacacs**show tacacs***alarm****alarm**

**{contact <1-2> analog [coefficient <-2147483.647 - 2147483.646>] | [offset <-2147483.647 - 2147483.6476>] | [units <LINE>] | description <LINE>] | [severity major | minor | none] <2> analog coefficient <-2147483.647 - 2147483.646> | offset <-2147483.647 - 2147483.646> | units <LINE> <A-B> | description <LINE> | [digital power-source dry | wet] | [trigger closed | open] | [output sink] | [pulse-counter mode pulses | transitions] | [trigger open | closed] | [severity major | minor | none] |**

**facility input-alarm <1> analog [high <-2147483.647 - 2147483.6476>] | [low <-2147483.647 - 2147483.646>] | [lte-data-disc] | [notifies] | [relay minor relay-mode energized] | [syslog] | [standby-mode disable | [lte-data-disc] | [notifies] | [relay minor] | [syslog] | temperature primary high <-150-300> | low <-200 - 250> | [lte-data-disc] | [notifies] | relay [minor | major] | [syslog] | secondary high <-150-300> | low<-200 -250> | [lte-data-disc] | [notifies] | [relay] | [syslog] | [profile <WORD>] |**

**facility power-supply rps [disable | notifies | syslog]**

**relay major relay-mode energizer | [minor relay-mode energized]}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	alarm
--------------------	-------



---

**profile** <WORD> | See *(config-alarm-profile)#* for configuring parameters.

---

**Command Modes** alarm

---

### Usage Guidelines

Use this command to configure parameters for alarms.

---

### Examples

This example enables syslog logger for redundant power supply messages.  
 PerleSCR(config)#alarm facility power-supply rps syslog<cr>

---

### Related Commands

*show alarm*  
*(config-alarm-profile)#*

### **(config-alarm-profile)#**

{**alarm** | **link-fault** | **not-forwarding** | **not operating** |  
**notifies** | **link-fault** | **not-forwarding** | **not operating** |  
**relay** | [**major link-fault** | **not forwarding** | **not operating**] | [**major** | **minor** |  
**syslog link-fault** | **not-forwarding** | **not operating**}

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description **(config-alarm-profile)#**

{**alarm** | **link-fault** | **not-forwarding** | **not operating** |

Monitors for alarm type.

- link-fault
  - port-not-forwarding
  - port-not-operating
- 

**notifies** | **link-fault** | **not forwarding** | **not operating** |

Sends a trap/notification to the configured SNMP host trap receivers on the triggering and clearing of the alarms.

- link-fault
  - port-not-forwarding
  - port-not-operating
- 

**syslog link-fault** | **not-forwarding** | **not operating**

Sends a syslog message to the configured syslog host on the triggering and clearing of these alarms.

- link-fault
  - port-not-forwarding
  - port-not-operating
- 

### Command Modes

Perle(config-alarm-profile)#

---

**Usage Guidelines**

Use this command to configure alarm profile parameters.

---

**Examples**

This example configures an alarm profile to monitor for link fault and send a syslog message to the configured server.

```
Perle(config)#alarm profile test-alarm
Perle(config-alarm-profile)#alarm link-fault
Perle(config-alarm-profile)#syslog link-fault
```

---

**Related Commands**

*show alarm*

## archive

**(config-archive)#**

```
{maximum 1-14 |
path flash: | ftp: | http: | https: | scp: | sftp | tftp: sdfsflash: |
time-period <0-525600> |
update-sw check | auto-download |
write-memory }
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-archive)#**

<b>{maximum 1-14  </b>	Configure the number of configuration archives to keep in the archive list. Archive list can contain between 1–14 configurations.
<b>path flash:   ftp:   http:   https:   scp:   sftp   tftp: sdfsflash:  </b>	Configure the file system path for archived configurations. The path must exist.
<b>time-period &lt;0-525600&gt;  </b>	Configure the time period to automatically save the running configuration to an archive file.
<b>update-sw check   auto-download  </b>	Enables update-software check. Check default is Disabled Auto-download is enabled for FN models
<b>write-memory }</b>	Enables—saves the configuration to an archive file each time you copy running-config to start-up config.

---

<b>Command Default</b>	no path maximum 10 no time-period no write-memory
<b>Command Modes</b>	Perle(config-archive)#archive

---

### Usage Guidelines

Use this command to configure the full path to store archive configuration files.

**flash:***perle-image-name.img*

**sdflash:***perle-image-name.img*

**ftp:***[[/username[:password]@location]/directory]/perle-image-name.img*

**http:***[[/username[:password]@][hostname | host-ip [directory] /perle-image-name.img*

**https:***[[/username[:password]@][hostname | host-ip [directory] /perle-image-name.img |*

**scp:***[[username@location]/directory]/perle-image-name.img |*

**sftp:***[[/username[:password]@location]/directory]/perle-image-name.img |*

**tftp:***[[/location]/directory]/perle-image-name.img*

---

### Examples

This example sets up an archive path for the write-memory command.

```
Perle(config-archive)#path flash:
```

```
Perle(config-archive)#write-memory
```

```
Perle(config-archive)#exit
```

```
Perle(config)#exit
```

If you do not supply a filename, then your running config is named with the current date and time. See below.

```
Perle#show flash:
```

```
Directory of flash:
```

```
78  -rw-   10764  Sep 22 2020 11:30 -06:00 -Sep-22-11-30-29-0130322  -rw-  
5643 Perle
```

---

### Related Commands

*show archive*

*(config-archive)#*

*archive*

## arp

### arp

```
{<A.B.C.D> <H.H.H> [bvi <1-9999>] | [dot11radio <0-4>] | [ethernet 2 . <1-4000>]}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description**                      **arp**

---

```
{<A.B.C.D> <H.H.H> bvi <1-9999> | [dot11radio <0-4>] | [ethernet 2. <1-4000>]}
```

Add static ARP entry to the ARP table.

**Command Modes**

Perle(config)#arp

**Usage Guidelines**

Use this command to add ARP entries to ARP table.

**Examples**

Add this ARP entry to the ARP table.

Perle(config)#arp 172.16.44.55 1234.1234.1234 bvi 2

**Related Commands***show arp***banner****banner**

```
{<LINE> |
login <LINE> |
motd <LINE> |
prompt-timeout}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****banner**


---

{<LINE>	Configure a delimiting character to indicate the start and end of the message. It cannot be a character that you use in the message. Do not use " or % as a delimiting character. No white space characters are allowed.
login <LINE>	Configure the login banner.
motd <LINE>	Configure the message of the day (MOTD) on login.
prompt-timeout <LINE> }	Configure the message for login authentication timeout.

---

**Command Modes**

Perle(config)#banner

---

### Usage Guidelines

Use this command to configure a banner or message of the day to display to users.

**delimiter character**—indicates the start and end of the message and is not a character that you use in the message. Do not use " or % as a delimiting character. White space characters do not work.

**banner text**—the text is alphanumeric, case sensitive, and can contain special characters. It cannot contain the delimiter character you have chosen. The text has a maximum length of 80 characters and a maximum of 40 lines.

The banner has special macros that are inserted into the banner.

They are:

**\$(hostname)** which is the hostname you configured on the switch and **\$(domain)** which is the domain name you configured on the IOLAN.

**login**—set login banner

**motd**—set message of the day (motd)

**prompt-timeout**—login authentication timeout

Banner applies to all consoles and vty sessions.

---

### Examples

Displays a message of the day at login.

```
Perle(config)#banner motd line
```

```
Enter text message. End with the character ']'
```

```
Good morning crew
```

Enter configuration commands, one per line. End with CNTL/Z

This example sets the domain name to be used in the banner, then set a banner of Good morning and Welcome to your domain. Domain is replaced with the domain name of MYTEST-DOMAIN.

```
Perle(config)# ip domain-name MYTEST-DOMAIN
```

```
Perle(config)#banner hGood morning and Welcome to your h
$(domain)
```

---

### Related Commands

[\(config-line\)#console](#)

[\(config-line\)#vty](#)

## boot

### boot

```
{host dhcp | [retry timeout <600-65535>]}
```

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

**boot**

```
{host dhcp | [retry timeout
<600-65535>]}
```

Configure boot parameters.

**host dhcp**—enables Zero Touch provisioning (ZTP). Download configuration via DHCP server.

**host retry timeout**—sets the time in seconds to wait for ZTP to complete (including time to download config or software).

**no boot host retry timeout**—waits indefinitely for ZTP to complete.

---

### Command Modes

Perle(config)#boot

---

### Usage Guidelines

Use this command to enable ZTP. This command allows you to download your config and firmware via your DHCP server.

---

### Examples

This example configures ZTP so that configuration and firmware files are downloaded from your DHCP server.

```
Perle(config)#boot host dhcp
```

## bridge

### bridge

```
{bridge <1-4000> spanning-tree | protocol ieee |
spanning-tree logging}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

#### spanning-tree

```
{bridge <1-4000> | spanning-
tree | protocol ieee |
```

Configure the bridge range and spanning-tree.

Values are 1 to 4000.

```
spanning-tree logging}
```

Configure spanning tree logging.

---

### Command Modes

Perle(config)#spanning-tree bridge

---

### Usage Guidelines

Use this command to configure a bridge range and enable spanning tree sub-menu. Spanning Tree Protocol (STP) is a loop free topology for an Ethernet local area network. If loops are detected, the protocol blocks one of the paths to eliminate the loop. STP prevents bridge loops and broadcast radiation. The spanning-tree protocol is applied to previously defined bridge interfaces.

---

### Examples

This example configures bridge 10 with spanning-tree.

```
Perle(config)#bridge 10 spanning-tree
```

```
Perle(config-st-bridge)#
```

**Related Commands***(config-st-bridge)#***(config-st-bridge)#**

```

{aging -time <10-1000000> |
forward-time <4-30> |
hello-timer <1-10> |
loop-guard default |
max-age <10-1000000> |
max-hops <6-40> |
mode mstp | rstp | stp |
mst instance <0-4000> | name <WORD> revision <0-65535> |
port-fast disable | edge | network |
priority <0-61440> |
root |
transmit hold-count <1-10>}

```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-st-bridge)#**

<b>{aging -time &lt;10-1000000&gt;  </b>	Configure the timeout period in seconds, for aging out dynamically learned forwarding information. Values are 1 to 1000000 in seconds Default is 300 seconds
<b>forward-time &lt;4-30&gt;  </b>	Configure the forward delay timer. The forward delay timer is the time interval spent in the listening and learning state. Values are 4 to 30 seconds Default is 15 seconds.
<b>hello-timer &lt;1-10&gt;  </b>	Configure the hello timer. The hello timer is the time between each bridge protocol data unit (BPDU) sent on a port. Values are 1 to 10 seconds Default is 2 seconds.
<b>loopguard default  </b>	Configure the Spanning Tree Protocol (STP) loop guard feature which provides additional protection against Layer 2 forwarding loops (STP loops).

	<p>An STP loop is created when an STP blocking port in a redundant topology erroneously transitions to the forwarding state.</p> <p>Default is Disabled</p>
<b>max-age</b> <10-1000000>	<p>Configure the max age timer to control the maximum length of time that passes before a bridge port saves its configuration BPDU information.</p> <p>Value are 10 to 100000 seconds</p> <p>Default is 20 seconds</p>
<b>max-hops</b> <6-40>	<p>Configure the number of possible hops in the region before a bridge protocol data unit (BPDU) is discarded.</p> <p>Value are 6 to 40</p> <p>Default is 20</p>
<b>mode</b> mstp   rstp   stp	<p>Set the spanning tree mode.</p> <ul style="list-style-type: none"> <li>• Spanning Tree Protocol (STP)</li> <li>• Rapid Spanning Tree Protocol (RSTP)</li> <li>• Multiple Spanning Tree Protocol (MSTP)</li> </ul> <p>Default is RSTP</p>
<b>mst instance</b> <0-4000>   <b>name</b> <WORD> <b>revision</b> <0-65535>	<p>Configure MST instances for the region. Each region can have multiple instances. Map VLANs to an MST instance (0-63). Instance 0 cannot be deleted and is used to map/unmapped VLANs to instance 0. Each instance has a VLAN or range of VLANs which is associated with it.</p> <p>Name—define the name of the region.</p> <p>Revision—This setting must be the same for all MSTP switches in the same MST region</p>
<b>port-fast disable</b>   <b>edge</b>   <b>network</b>	<p>A spanning tree normal port is one that functions in the default manner for spanning tree. Under normal circumstances it will transition from the Listening, Learning, Forwarding stages based on the default timers. PortFast causes a port to enter the spanning tree forwarding state immediately, bypassing the listening and learning states.</p>



STP enabled ports that are connected to devices such as a single switch, workstation, or a server can access the network only after passing all these STP states. Some applications need to connect to the network immediately, else they will timeout.

**Disable**—go through normal learning/forwarding and blocking states.

**Network**—Interface goes into forward state immediately. Portfast network protects against loops by detecting unidirectional links in the STP topology.

**Edge**—is used to configure a port on which an end device is connected such as a PC. All ports directly connected to end devices cannot create bridging loops in the network. Therefore, the edge port directly transitions to the forwarding state, and skips the listening and learning stages. However, the specific command configures a port such that if it receives a BPDU, it immediately loses its edge port status and becomes a normal spanning-tree port.

---

**priority** <0-61440> |

Every IOLAN participating in a Spanning Tree Protocol (STP) network is assigned with a numerical number called a bridge priority value. Priority values decide who will be elected as root. You can set the bridge priority in increments of 4096 only.

When you set the priority, valid values are 0, 4096, 8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152, 53248, 57344, and 61440.

You set the priority value argument to 0 to make the IOLANroot.

Default is 32768

---

**root** |

Configure the root bridge. The root bridge is the bridge with the smallest (lowest) bridge ID.

---

**transmit hold-count** <1-10> }

Controls the number of BPDUs sent before pausing for 1 second.

Range is 1 to 10 seconds

Default is 6 seconds

---

**Command Modes**

Perle(config-st-bridge)#

---

**Usage Guidelines**

Configures the parameters for Spanning Tree Protocol.

---

**Examples**

This example sets mode to MSTP.

```
Perle(config-st-bridge)#spanning-tree mode mstp
```

---

**Related Commands**

*(config-st-bridge)#*

**cellular****cellular**

```
{profile <WORD> authentication chap | pap | none | [band 1800 | 1900 | 850 | 900
| b13 | b17 | b2 | b4 | b5 | bc2 | bc4 | bc5 | auto] | data-apn access-point-name
<WORD> | cid <1-16> | pdp-type ipv4 | ipv4ipv6 | ipv6 | data-limit action-on
limit disable-lte | none | alert-on-limit off|on | alert-percentage <0-99> | bill-day
<1-31> | mb-size <0-100000> | [password 0 <LINE> | 7 <LINE> | <LINE> | 0
<LINE> | 7 <LINE> | <LINE>] | roaming on | off | technology auto | lte | umts |
gsm | username <WORD> |
sms authentication method both | none | password | phone | user <WORD>
enable | password 0 <WORD> | 7 <WORD> | <WORD> | phone <LINE> |
privilege admin | none | restricted}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****cellular**

---

```
[band 1800 | 1900 | 850 | 900 |
b13 | b17 | b2 | b4 | b5 | bc2 |
bc4 | bc5 | auto |
```

---

Configure cellular profile parameters. Some bands may not be available on all models.

---

```
[password 0 <LINE> | 7
<LINE> | <LINE> | 0 <LINE>
| 7 <LINE> | <LINE>] |
roaming on | off | sim-slot 1 | 2
| technology auto | lte | umts |
username <WORD> |
```

---

Configure SMS authentication parameters.

---

**Command Default**

SMS authentication default method is both.

---

**Command Modes**

Perle(config)#cellular

---

**Usage Guidelines**

Use this command to configure cellular profiles.

---

**Examples**

This example sets up a cellular connection using a profile test to browse the Internet.  
 Perle(config)#cellular profile test data-apn access-point-name ssid90 cid 10

---

**Related Commands**

*(config-st-bridge)#*

---

**(config-st-bridge-mst-instance)#**

{**priority 0-61440**> |  
**vlan <1-4000>**}

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-st-bridge-mst-instance)#**

{**priority 0-61440**> |

Every IOLAN participating in a Spanning Tree Protocol (STP) network is assigned with a numerical number called a bridge priority value.

{**priority 0-61440**> |

Priority values decide who will be elected as root. You can set the bridge priority in increments of 4096 only.

When you set the priority, valid values are 0, 4096, 8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152, 53248, 57344, and 61440.

You set the priority value argument to 0 to make the IOLAN.

Default is 32768

**vlan <1-4000>**}

Configure the range of VLANs to add this instance mapping

---

**Command Modes**

Perle(config-st-bridge-mst)#

---

**Usage Guidelines**

Configures the priority parameters for Multiple Spanning Tree Protocol (MST).

---

**Examples**

This example sets the bridge priority to 28672.  
 Perle(config-st-bridge-mst)#priority 28672

---

**Related Commands**

*(config-st-bridge)#*

*(config-if)#ethernet*

## class-map

**class-map** {<1-4094>}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	class-map
{<1-4094>}	Configure a class-map number. Priority queues can only use class 1–7.
<b>Command Modes</b>	Perle(config)#class-map

### Usage Guidelines

Use this command to classify inbound network traffic destined to, or passing through, the IOLAN based on a series of flow match criteria. The class map classifies network traffic based on various match criteria configured within a class map. In other words, it defines traffic classes. A class map can reference an ACL to be used as the criteria or specific criteria is applied to the class map. Class maps in turn are referenced by policy maps.

### Examples

This example creates class map 1.

```
Perle(config)#class-map 1
```

### Related Commands

[policy-map](#)

**(config-cmap)#**

{**description** <LINE> |  
**match-name** <NAME>}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-cmap)#
{ <b>description</b> <LINE>	Configure a class-map match-name description.
<b>match-name</b> <NAME>}	Configure a name for this classification.
<b>Command Modes</b>	Perle(config-cmap)#

### Usage Guidelines

Use this command to create a classification. Classifications are separation of packets into traffic classes. Configure the device to take a specific action on the specified classified traffic, such as policing or marking down, or other actions.

---

## Examples

In this example the name specified for this classification is match-icmp.

```
Perle(config-cmap)#match-name match-icmp
```

---

## Related Commands

```
(config-st-bridge-mst-instance)#
```

```
(config-cmap-match)#
```

```
policy-map
```

### (config-cmap-match)#

```
match ethernet destination <H.H.H> source type | type <0-65535> |
interface [bvi <1-999>] | [dialer <0-15>] | [dot11radio <0-4>] | ethernet<1-2> |
[openvpn-tunnel <0-999>] | [tunnel <0-999>] |
ip [destination address <A.B.C.D> <A.B.C.D> | port <0-65535>] | [dscp <0-63> |
af11 | af12 | af13 | af21 | af22 | af23 | 31 | af32 | af33 | af41 | af42 | af43 | cs1 | cs2 |
cs3 | cs4 | cs5 | cs6 | cs7 | default | ef] | [max-length <0-65535>] | [protocol <0-
255> | ah | dccp | dsr | egp | eigrp | encap | esp | etherip | ggp | gre | hmp | icmp |
odpr | igmp | igp | ip | ipip | ipv6 | ipv6-frag | ipv6-icmp | ipv6-nonxt | opts | ipv6-
route | isis | l2tp | manet | mpls-in-ip | narp | osfo | pim | rdp | roch | rsvp | sctp |
sdrp | shim6 | skip | tcp | udp | udplite | vrrp | xns-idp] | [source address
<A,B.C.D> <A,B.C.D>] | [port <1-65535>] | [tcp-flags ack | syn] |
ipv6 [destination <X:X:X:X::X>/<0-128> | port <0-65535>] | [dscp <0-63> | af11 |
af12 | af13 | af21 | af22 | af23 | 31 | af32 | af33 | af41 | af42 | af43 | cs1 | cs2 | cs3 |
cs4 | cs5 | cs6 | cs7 | default | ef] | [max-length <0-65535>] | [protocol <0-255> | ah
| dccp | dsr | egp | eigrp | encap | esp | etherip | ggp | gre | hmp | icmp | odpr | igmp
| igp | ip | ipip | ipv6 | ipv6-frag | ipv6-icmp | ipv6-nonxt | opts | ipv6-route | isis |
l2tp | manet | mpls-in-ip | narp | osfo | pim | rdp | roch | rsvp | sctp | sdrp | shim6 |
skip | tcp | udp | udplite | vrrp | xns-idp] | [source address <X:X:X:X::X>/<0-128>]
| [port <1-65535>] | [tcp-flags ack | syn] |
mark <1-214748748364> |
vlan <1-4000>}
```

Use the no form of this command to negate a command or set to defaults.

---

## Syntax Description

### (config-cmap-match)#

```
{description <LINE> |
```

Description of class-map match-name.

```
match ethernet destination
<H.H.H> source type | type
<0-65535> |
```

Match Ethernet header.

---

<pre>interface [bvi &lt;1-999&gt;]   [dialer &lt;0-15&gt;]  [dot11radio &lt;0-4&gt;]  [ethernet&lt;1-2&gt;] [openvpn-tunnel &lt;0-999&gt;]   [tunnel &lt;0-999&gt;]  </pre>	Match interface.
<hr/>	
<pre>ip [destination address &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;   port &lt;0-65535&gt;]   [dscp &lt;0-63&gt;   af11   af12   af13   af21   af22   af23   31   af32   af33   af41   af42   af43   cs1   cs2   cs3   cs4   cs5   cs6   cs7   default   ef]   [max-length &lt;0-65535&gt;]   [protocol &lt;0-255&gt;   ah   dccp   dsr   egp   eigrp   encap   esp   etherip   ggp   gre   hmp   icmp   odpr   igmp   igp   ip   ipip   ipv6   ipv6-frag   ipv6- icmp   ipv6-nonxt   opts   ipv6- route   isis   l2tp   manet   mpls-in-ip   narp   osfo   pim  </pre>	Match IPv4 protocol header.
<hr/>	
<pre>rdp   roch   rsvp   setp   sdrp   shim6   skip   tcp   udp   udplite   vrrp   xns-idp]   [source address &lt;A,B.C.D&gt; &lt;A,B.C.D&gt;]   [port &lt;1-65535&gt;]   [tcp-flags ack   syn]  </pre>	

<b>ipv6 [destination</b> <b>&lt;X:X:X:X::X/&lt;0-128&gt;   port</b> <b>&lt;0-65535&gt;]   [dscp &lt;0-63&gt;  </b> <b>af11   af12   af13   af21   af22  </b> <b>af23   31   af32   af33   af41  </b> <b>af42   af43   cs1   cs2   cs3   cs4  </b> <b>cs5   cs6   cs7   default   ef]  </b> <b>[max-length &lt;0-65535&gt;]  </b> <b>[protocol &lt;0-255&gt;   ah   dccp  </b> <b>dsr   egp   eigrp   encap   esp</b> <b>  etherip   ggp   gre   hmp  </b> <b>icmp   odpr   igmp   igp   ip  </b> <b>ipip   ipv6   ipv6-frag   ipv6-</b> <b>icmp   ipv6-nonxt   opts   ipv6-</b> <b>route   isis   l2tp   manet  </b> <b>mpls-in-ip   narp   osfo   pim  </b> <b>rdp   roch   rsvp   sctp   sdrp  </b> <b>shim6   skip   tcp   udp  </b> <b>udplite   vrrp   xns-idp]  </b> <b>[source address</b> <b>&lt;X:X:X:X::X/&lt;0-128&gt;]   [port</b> <b>&lt;1-65535&gt;]   [tcp-flags ack  </b> <b>syn]   udplite   vrrp   xns-idp  </b> <b>source address</b> <b>&lt;X:X:X:X::X/&lt;0-128&gt;   port</b> <b>&lt;1-65535&gt;   tcp-flags ack   syn</b> <b> </b>	Match IPv6 protocol header.
<b>mark &lt;1-214748748364&gt;  </b>	Match on mark applied by policing routing.
<b>vlan &lt;1-4000&gt;} </b>	Match on VLAN ID
<b>Command Modes</b>	Perle(config-cmap-match)#

### Usage Guidelines

Use the match command to configure "rules" or matches to apply to the class-map. If the packet matches any of the criteria configured for this class map, then this class map is applied to the packet.

### Examples

This example I have specified the name bridge-50-match and matched on ip source address of 172.16.88.88.

```
Perle(config-cmap)#match-name bridge50-map
```

```
Perle(config-cmap-match)#match ip source address 172.16.88.88 icmp
```

**Related Commands**

*(config-cmap)#*  
*(config-st-bridge-mst-instance)#*  
*policy-map*

**clock****clock**

```
{summer-time <WORD> date <1-31> <MONTH> <hh:mm> <1-31>
<MONTH> < hh:mm > [<1-1440-in-minutes>] | [recurring [<1-4 >] [<FIRST >]]
[<LAST>] |
timezone <WORD> <-23 - 23> | [<0-59>]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	clock
<pre>{summer-time &lt;WORD&gt; date &lt;1-31&gt; &lt;MONTH&gt; &lt;hh:mm&gt; &lt;1-31&gt; &lt;MONTH&gt; &lt; hh:mm &gt; [&lt;1- 1440-in-minutes&gt;]   [recurring &lt;1-4 &gt;] [&lt;FIRST &gt;] [&lt;LAST&gt;]</pre>	<p>Configure the name of the summer time zone followed by start/end dates.</p> <p><b>Configure start time:</b></p> <ul style="list-style-type: none"> <li>• numeric value for the day of the month to start summer timezone 1–31</li> <li>• numeric value for the day of the month to start summer timezone 1–31</li> <li>• name of the month to start January, February, March, April, May, June, July, August, September, October, November, December</li> <li>• time to start in hours (24 hour clock) and minutes</li> </ul> <p><b>Configure end time:</b></p> <ul style="list-style-type: none"> <li>• numeric value for the day of the month to end summer timezone 1–31</li> <li>• name of the month to end (January, February, March, April, May, June, July, August, September, October, November, December)</li> </ul>
<pre>timezone &lt;WORD&gt; &lt;-23 - 23&gt;   [&lt;0-59&gt;]}</pre>	<ul style="list-style-type: none"> <li>• time to end in hours (24 hour clock) offset in minutes 1–1440</li> </ul> <p>Configure the timezone as hours/minutes offset from Universal Time Clock (UTC).</p>
<b>Command Modes</b>	Perle(config)#clock



---

**Usage Guidelines**

Use this command to configure the clock.

---

**Examples**

This example configures the clock 6 hours off from UTC.

```
Perle(config)#clock timezone ont-time-zone -6
```

---

**Related Commands**

*show clock*

## controller

**controller**

```
{cellular <0-0>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****controller**

```
{cellular <0-0>}
```

Enter sub-menu cellular mode.

---

**Command Modes**

Perle(config)#controller

---

**Usage Guidelines**

Use this command to enter sub-menu cellular mode.

---

**Examples**

This example enter sub-menu cellular mode.ass map 1.

```
Perle(config)#controller cellular 0
```

---

**Related Commands**

*(config-controller)#*

**(config-controller)#**

```
{gns antenna dedicated active | diversity | enable | receiver-disabled |  
lte alternative-profile <WORD> | diversity | enable | [failover | connect-retires  
<1-100> | enable | revert-timer <1-1500> signal-loss-timer <1-60> | signal  
threshold <-150-0>] | primary-profile <WORD> | radio-disable | power-down}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-controller)#**

---

**lte alternative-profile** *<WORD>* | **diversity** | **enable** | **[failover** | **connect-retires** *<1-100>* | **enable** | **revert-timer** *<1-1500>* | **signal-loss-timer** *<1-60>* | **signal threshold** *<-150-0>* | **primary-profile** *<WORD>*

Enable, configure and disable features on the LTE (cellular) interface.

---

**Command Modes**

Perle(config-controller)#

---

**Usage Guidelines**

Use this command to configure LTE parameters found under the config-controller sub-menu.

---

**Examples**

In this example we are going to activate the use of the diversity antenna.  
Perle(config-controller)#lte diversity

---

**Related Commands**

*(config-st-bridge-mst-instance)#*  
*(config-cmap-match)#*  
*policy-map*

## crypto

### crypto

{**ipsec client** *<WORD>* | **enable** | [**esp-group** *<WORD>*] | [**ike-group** *<WORD>*] | **[import ipsec.conf terminal** | **flash:filename**] | **ftp://[username[:password]@location]/directory/filename** | **http://[username:password]@[hostname | host-ip [directory] /filename** | **https://[username:password]@[hostname | host-ip [directory] /filename** | **scp://username@location/directory/filename** | **sftp://[username[:password]@location]/directory/filename** | **tftp://[location]/directory/filename** | **l2tp** | **nat-network** *<A.B.C.D/N>* | **nat-transversal** |

**key** [**export password-cryptkey terminal**] | [**rsa public** | **terminal 3des** *<LINE>*] | **des** *<LINE>* | **flash:filename**] | **ftp://[username[:password]@location]/directory/filename** | **http://[username:password]@[hostname | host-ip [directory] /filename** | **https://[username:password]@[hostname | host-ip [directory] /filename** | **scp://username@location/directory/filename** |

```

sftp:[//username[:password]@location/]directory/]filename |
tftp:[//location/]directory/]filename |
generate [password-cryptkey] | rsa modulus <1024-4096> |

import [client rsa pem | pkcs12 terminal password <LINE>] | url
flash:filename | ftp:[//username[:password]@location/]directory/]filename |
http://[[username:password]@][hostname | host-ip [directory] /filename |
https://[[username:password]@][hostname | host-ip [directory] /filename |
scp:[[username@location/]directory/]filename |
sftp:[//username[:password]@location/]directory/]filename |
tftp:[//location/]directory/]filename] | [password-cryptkey terminal]
ssh-host rsa terminal <LINE> | url
flash:filename | ftp:[//username[:password]@location/]directory/]filename |
http://[[username:password]@][hostname | host-ip [directory] /filename |
https://[[username:password]@][hostname | host-ip [directory] /filename |
scp:[[username@location/]directory/]filename |
ctory/]filename | sftp:[//username[:password]@location/]directory/]filename |
tftp:[//location/]directory/]filename] |
[zeroize password-cryptkey | rsa |

openvpn connection <WORD> | enable | [generate secret <name>] | [import ca
<NAME>] | [cert <NAME>] | dh <WORD> | key <NAME> | secret <NAME> |
template <NAME>]
terminal | url flash:filename |
ftp:[//username[:password]@location/]directory/]filename |
http://[[username:password]@][hostname | host-ip [directory] /filename |
https://[[username:password]@][hostname | host-ip [directory] /filename |
scp:[[username@location/]directory/]filename |
sftp:[//username[:password]@location/]directory/]filename |
tftp:[//location/]directory/]filename} |
zeroize ca <NAME> | cert <NAME> | key <NAME> |

pki import client | https pem | pkcs12} | {openvpn ca <NAME> | cert <NAME> |
key <NAME>} | {server test pem | pkcs12} terminal | url flash:filename |
ftp:[//username[:password]@location/]directory/]filename |
http://[[username:password]@][hostname | host-ip [directory] /filename |
https://[[username:password]@][hostname | host-ip [directory] /filename |
scp:[[username@location/]directory/]filename |
sftp:[//username[:password]@location/]directory/]filename |
tftp:[//location/]directory/]filename |
zeroize [https] | [openssl ca <NAME> | cert <NAME> | key <NAME>] |
[server <WORD>] |

ssl algorithm encryption suite-b-tls | tls-1.2}

```

Use the no form of this command to negate a command or set to defaults

Syntax Description	crypto
<pre>{[ipsec client &lt;WORD&gt;   enable   esp-group &lt;WORD&gt;   ike-group &lt;WORD&gt;   import ipsec.conf terminal   flash:filename   ftp://[username[:password]@ location]/directory]/filename   http://[[username:password]@] [hostname   host-ip [directory] filename  https://[[username:password] @]/[hostname   host-ip [directory] /filename   scp://[username@location]/dire ctory]/filename   sftp://[username[:password]@ location]/directory]/filename   tftp://[location]/directory]/file name   l2tp   nat-network &lt;A&gt;&lt;B&gt;&lt;C&gt;&lt;D/N&gt;   nat-transversal  </pre>	<p>See (<i>config-client</i>) to configure parameters.</p> <p>Enables or restarts IPsec.</p> <p>See (<i>config-esp</i>)# to configure parameters.</p> <p>See (<i>config-ike</i>)# to configure parameters.</p> <p>Configure Specify where to import the ipsec.conf file.</p> <p>See (<i>config-l2tp</i>) to configure parameters.</p> <p>Configure a permitted IPsec Network Address Translation (NAT) network/mask.</p> <p>Enables Network Address Translation (NAT) Transversal. NAT Transversal allows traffic to get to the specified destination when a device does not have a public IP address.</p> <p>This is usually the case if your ISP is doing NAT, or the external interface of your firewall is connected to a device that has NAT enabled.</p>

```

key [export password-
cryptkey terminal] | [rsa
public | terminal 3des <LINE>
| des <LINE> | flash:filename]
|
ftp:[//[username[:password]@l
ocation]/directory]/filename |
http:[//[username:password]@]
[hostname | host-ip [directory]
/filename |
https:[//[username:password]
@][hostname | host-ip
[directory] /filename |
scp:[username@location]/dire
ctory]/filename |
sftp:[//[username[:password]@
location]/directory]/filename |
tftp:[//[location]/directory]/file
name |
generate [password-cryptkey]
| rsa modulus <1024-4096> |
[import [client rsa pem |
pkcs12 terminal password
<LINE> | url flash:filename |
ftp:[//[username[:password]@l
ocation]/directory]/filename |
http:[//[username:password]@]
[hostname | host-ip [directory]
/filename |
https:[//[username:password]
@][hostname | host-ip
[directory] /filename |
scp:[username@location]/dire
ctory]/filename |
sftp:[//[username[:password]@
location]/directory]/filename |
tftp:[//[location]/directory]/file
name] | [password-cryptkey
terminal]
ssh-host rsa terminal <LINE>
| url
flash:filename |

```

Configure long term key operations.

---

```

ftp:[//[username[:password]@l
ocation]/directory]/filename |
http:[//[username:password]@]
[hostname | host-ip [directory]
/filename |
https:[//[username:password]
@]/[hostname | host-ip
[directory] /filename |
scp:[[username@location]/dire
ctory]/filename |
ctory]/filename |
sftp:[//[username[:password]@
location]/directory]/filename |
tftp:[//[location]/directory]/file
name] |

```

```

[zeroize password-cryptkey |
rsa

```

---

```

openvpn connection <WORD>
| enable | generate secret
<NAME> | import ca
<NAME> | cert <NAME> |
{dh <WORD> | key <NAME>
| secret <NAME> |template
<NAME>}terminal | url
flash:filename |
ftp:[//[username[:password]@l
ocation]/directory]/filename |
http:[//[username:password]@]
[hostname | host-ip [directory]
/filename |
https:[//[username:password]
@]/[hostname | host-ip
[directory] /filename |
scp:[[username@location]/dire
ctory]/filename |
sftp:[//[username[:password]@
location]/directory]/filename |
tftp:[//[location]/directory]/file
name} |
zeroize ca <NAME> | cert
<NAME> | key <NAME> |
pki import client | https pem |
pkcs12} | {openvpn ca
<NAME> | cert <NAME> | key
<NAME>} | {server test pem |
pkcs12} terminal | url

```

See ([config-connection](#)) to configure parameters.

Configure public key components.  
Configure local key or certificate filename.

```

flash:filename |
ftp:[[//username[:password]@]l
ocation]/directory]/filename |
http:[[//username:password]@]
[hostname | host-ip [directory]
/filename |
https:[[//username:password]
@]/hostname | host-ip
[directory] /filename |
scp:[[username@location]/dire
ctory]/filename |
sftp:[[//username[:password]@]
location]/directory]/filename |
tftp:[[//location]/directory]/file
name |
zeroize [https] | [openssl ca
<NAME>] | cert <NAME> | key
<NAME>] | [server <WORD>]

```

---

```

ssl algorithm encryption suite-
b-tls | tls-1.2}

```

Configure the SSL encryption method.

---

**Command Modes**

Perle(config)#crypto

---

### Usage Guidelines

Use this command to configure parameters for IPsec configuration, key, OpenVPN configuration, PKI, and SSL parameters.

---

### Examples

This example exports the public key from the IOLAN to the terminal session.

```
Perle(config)# crypto key export rsa public terminal
```

```
ssh-rsa
```

```

AAAAB3NzaC1yc2EAAAADAQABAAQDRknFjyYmPYATixxn1nGVe3xyncwk
hAbKO3JFUI5Vvnd50wT5gYNxd4vP4dJe4J5/mvzG7rcbZ4uCz/dX8xMs18xUzpoq
HbjOF5EUfBtPZzgl/IsDkwzflaWj/Qznau6TemWnR72RpzKaDRdFy0j4ghzvfUdXWz/
EKPq/5EJ97sdU97RzURfL8j4lwThanpLVi8kP8guNioYJdFgdrgerKg6aUTehU7C2
X9sai08e1WNcGA6Umlzj4rtUsV0Enu+Tx47WM6kcPij423QIM0abnn4RWwRPnU4
qINKTvWR4gKZQUpYEFpwtJgtpLGDOIYikMvZrc09X1D68Ttbx7

```

---

### Related Commands

*show crypto*

### (config-client)

```

{authentication identify <WORD> [pre-shared-key <WORD>] | [remote-identity
<WORD>] | [x509 <LINE>] | trustpoint <CA-FILE>] |
connection-type disable | initiate | respond] |

```

**ike-group** <WORD> |  
**local-address** [<A.B.C.D> | <X:X:X:X::X:X> | any] |  
**tunnel** <1-429467295> [esp-group <WORD>] | [local-address <A.B.C.D/N | X:X:X:X::X/N>] | protocol <0-255> | [ah | all | ax.25 | dccp | ddp | egp | eigrp | encap | exp | etherip | fc | ggp | gre | hip | hmp | hopopt | icmp | igp | ip | ipcomp | ipencap | ipip isis | iso--tp4 | l2tp | manet | mobility-header | mpls-in-ip | ospf | pim | pup | rdp | rohc | rspf | rsvp | setp | skip | st | tcp | tcp -udp | udp | udplite | vmtp | wesp | xns-idp | xtp] | [remote-address <A.B.C.D/N | X:X:X:X::X/N>] }  
 Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-client)**

<b>{ authentication identify</b> <WORD> [pre-shared-key <WORD>]   [remote-identity <WORD>]   [x509 <LINE>   trustpoint <CA-FILE>]	Configure the local authentication identity.
<b>connection-type disable  </b> <b>initiate   respond  </b>	Sets the connection type: <ul style="list-style-type: none"> <li>• initiate</li> <li>• respond</li> <li>• disable</li> </ul>
<b>ike-group</b> <WORD>	Configure IPsec IKE configuration.
<b>local-address</b> [<A.B.C.D>   <X:X:X:X::X:X>   any]	Configure the local address interface.
<b>tunnel</b> <1-429467295> [esp- group <WORD>]   [local- address <A.B.C.D/N   X:X:X:X::X/N>]   protocol <0- 255>   [ah   all   ax.25   dccp   ddp   egp   eigrp   encap   exp   etherip   fc   ggp   gre   hip   hmp   hopopt   icmp   igp   ip   ipcomp   ipencap   ipip isis   iso--tp4   l2tp   manet   mobility-header   mpls-in-ip   ospf   pim   pup   rdp   rohc   rspf   rsvp   setp   skip   st   tcp   tcp -udp   udp   udplite   vmtp   wesp   xns-idp   xtp]     [remote-address <A.B.C.D/N   X:X:X:X::X/N>] }	Configure the client tunnel parameters.
<b>Command Modes</b>	Perle(config-client)#



---

## Usage Guidelines

Use this command to configure IPSEC parameters.

---

## Examples

This example sets client connection to initiate.

```
Perle(config-client)#connection-type initiate
```

This example sets up the responder side of the connection.

```
Perle(config)#crypto ipsec client @myx509
```

```
Perle(config-client)#authentication x509 "C=CA, O=orgxdeb, CN=boxxdeb"
```

```
Perle(config-client)#authentication x509 trustpoint "CACert.pem"
```

```
Perle(config-client)# connection-type respond
```

```
Perle(config-client)# tunnel 0 local-address 192.168.51.111/32
```

```
Perle(config-client)# tunnel 0 remote-address 0.0.0.0/0crypto ipsec clinet @myx509
```

---

## Related Commands

*show crypto*

### (config-connection)

```
{ca <WORD> |
cert <NAME>|
cipher aes-128-cbc | aes-128-gcm | aes-192-cbc | aes-192-gcm | aes-256-cbc | aes-
256-gcm | bf-cbc | camellia-128-cbc | camellia-192-cbc | camellia-256-cbc | cast5-
cbc | des-cbc | des-ede-cbc | des-ede3-cbc | des-cbc | rc2-40-cbc | rc2-64-cbc | rc2-
cbc | seed-cbc |
client |
client-to-client |
comp-lzo [adaptive | no | yes |
dev <0-999> |
dh <WORD> |
ifconfig <A.B.C.D> <WORD> <A.B.C.D><WORD> |
keepalive <1-65535> <1-65535>|
key <WORD> |
lport <1-65535> |
persist-tun |
port <1-65535> |
pull |
remote [<A.B.C.D> | <WORD> | <X:X:X:X::X> <1-65535>] | [tcp | udp] |
remote-cert-tls client | server |
rport <1-65535> |
secret <NAME> |
server <A.B.C.D> <A.B.C.D> [no pool] |
```

```

server-bridge <A.B.C.D> <A.B.C.D> <A.B.C.D> <A.B.C.D> |
server-ipv6 <X:X:X:X::X> |
template <WORD> |
tls-auth |
tls-client |
tls-server |
user-pass <WORD> <WORD> 0 | 7 |
user-pass -verify |
verb <0-11> }

```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-connection)
{ca <WORD>	Configure the PKI CA trustpoint name.
cert <NAME>	Configure the PKI certificate name.
cipher aes-128-cbc   aes-128-gcm   aes-192-cbc   aes-192-gcm   aes-256-cbc   aes-256-gcm   bf-cbc   camellia-128-cbc   camellia-192-cbc   camellia-256-cbc   cast5-cbc   des-cbc   des-ede-cbc   des-ede3-cbc   des-cbc   rc2-40-cbc   rc2-64-cbc   rc2-cbc   seed-cbc	Configure the cipher for this connection.
client	Enables client mode if TCP mode is used with the remote command or if you receive the OpenVPN message "Options error: --proto tcp is ambiguous in this context. Please specify --proto tcp-server or --proto tcp-client"
client-to-client	Sets client to client mode for the connection. This lets connected clients see each other, not just the server.
comp-lzo [adaptive   no   yes]	Configure compression. In cases where the OpenVPN server pushes the request "comp-lzo no" to connecting clients, the client side breaks with repeated "write to TUN/TAP : Invalid argument (code=22)" errors unless it too has already specified "comp-lzo no". If you are a client and are using `pull` to get settings from the server, the connection may fail with that same message. To overcome this issue `comp-lzo no` must be defined in your connection.

	<b>Note:</b> the "no comp-lzo" (the default) turns off the entire compression subsystem which is required for connections not using compression.
<b>dev</b> <0-999>	Configure the OpenVPN interface number.
<b>dh</b> <WORD>	Configure Diffie-Hellman parameters.
<b>ifconfig</b> <A.B.C.D> <WORD> <A.B.C.D> <WORD>	Configure the local and the remote IP addresses for each side of the connection. Reverse the ip addresses when configuring "the other end".
<b>keepalive</b> <1-65535> <1-65535>	Configure the keepalive interval (in seconds) and the keepalive timeout (in seconds).
<b>key</b> <WORD>	Configure the PKI private key.
<b>lport</b> <1-65535>	Configure the port on the local side. Default is 1194
<b>persist-tun</b>	Keeps tun device between restarts.
<b>port</b> <1-65535>	Configure the port on both sides of the connection.
<b>pull</b>	Downloads the configuration from the server.
<b>remote</b> [<A.B.C.D>   <WORD>   <X:X:X:X::X> <1-65535>]   <b>[tcp   udp]</b>	Configure the remote host for connection.
<b>remote-cert-tls</b> <b>client</b>   <b>server</b>	Configure peer certificate checking as client or server.  When this is used with a TLS connection, the peer's certificate credentials are validated using the CA certificate referred to by the "ca" command.  This is recommended to mitigate man-in-the-middle attacks but can be left off if the signing CA certificate is not currently available.
<b>rport</b> <1-65535>	Configure the port on the remote side.
<b>secret</b> <NAME>	Configure the Pre-Shared secret key.
<b>server</b> <A.B.C.D> <A.B.C.D> <b>[no pool]</b>	Configure OpenVPN IPv4 server parameters.

<b>server-bridge</b> <A.B.C.D> <A.B.C.D> <A.B.C.D> <A.B.C.D>	Configure the gateway and IP pool addressing.
<b>server-ipv6</b> <X:X:X:X::X>	Configure OpenVPN IPv6 server parameters.
<b>template</b> <WORD>	Configure the connection template.
<b>tls-auth</b>	Sets a PSK to use for TLS authentication. The PSK previously defined via <code>crypto openvpn generate secret</code> name will be used. This can be used to add authentication to the TLS control channel to help reduce the chances of a DoS attack.
<b>tls-client</b>	Sets the IOLAN to act as a TLS client.
<b>tls-server</b>	Sets the IOLAN to act as a TLS server.
<b>user-pass</b> <WORD> <WORD> 0   7	Configure the remote user name and password.
<b>user-pass -verify</b>	Enables or disables server username and password verification.
<b>verb</b> <0-11>}	Configure the verbosity level. (debug)
<b>Command Modes</b>	Perle(config-connection)#

### Usage Guidelines

Use this command to configure parameters for OpenVPN connections.

### Examples

Configure OpenVPN remote port to 1050.  
Perle(config-connection)#rport 1050

### Related Commands

*show crypto*

```
(config-esp)#
{compression |
lifetime <30-86400> |
mode transport | tunnel |
pfs |
proposal <1-65535> [encryption 3des | aes128 | aes128gcm182 | aes256 |
aes256gcm128 | chacha20poly1305] | [hash md5 | sha1 | sha256 | sha384 |
sha512]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>(config-esp) #</b>	
{ <b>compression</b>	Configure compression for the IPsec connection.
<b>lifetime</b> <30-86400>	Configure tunnel expire timer after no activity. Range is 30 to 86400 Default is 1800 seconds
<b>mode transport</b>   <b>tunnel</b>	Configure the tunnel mode. <b>Transport mode</b> —payload encrypted; headers clear <b>Transport mode</b> —both headers and payload encrypted.
<b>pfs</b>	Configure PFS On to improve security by forcing a new key exchange for each new session. Both sides of the VPN tunnel must be able to support this option. Enabling PFS by renewing keys more often has performance impact but provides further security.
<b>proposal</b> <1-65535> [ <b>encryption</b> 3des   aes128   aes128gcm182   aes256   aes256gcm128   ch }	Configure the IKE/ESP proposal.
<b>Command Modes</b>	Perle(config-esp)#

### Usage Guidelines

Use this command to configure IPsec parameters.

### Examples

Configure esp group mode to transport.

```
Perle(config-esp)# mode transport
```

### Related Commands

*show crypto*

### (config-ike)#

```
{aggressive-mode |  
dpd action clear | hold | restart | interval <2-86400> | timeout <10-86400> |  
ike-version ike | ikev1 | ikev2 |  
lifetime <30-86400> |
```

**proposal** [dh-group 2 | 5 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26] |  
 [encryption 3des | aes128 | aes128gcm128 | aes256 | aes256gcm256 |  
 chacha20poly1305] | [hash md5 | sha1 | sha256 | sha384 | sha512]}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-ike) #
{ <b>aggressive-mode</b>	<p>Enables or disables aggressive mode. Aggressive mode uses fewer packet exchanges, therefore it is faster than main mode. However, aggressive mode does not give identity protection of the two IKE peers, unless digital certificates are used.</p> <p>This means VPN peers exchange their identities without encryption (clear text). You must use aggressive mode if one or both peers have dynamic external IP addresses or if you use Network Address Translation Traversal (NAT-T)            Default is Off</p>
<b>dpd action clear   hold   restart</b>   <b>interval</b> <2-86400>   <b>timeout</b> <10-86400>	<p>Configure Dead Peer Detection (DPD). This is a method of detecting a dead Internet Key Exchange (IKE) peer. This method uses IPsec traffic patterns to minimize the number of messages required to confirm the availability of a peer. DPD is used to reclaim the lost resources in case a peer is found dead.</p> <ul style="list-style-type: none"> <li>• <b>Clear</b>—terminate the VPN connection over the detection timeout. You must manually re-initiate the VPN connection. We recommend that you use Clear when the remote peer uses dynamic IP address.</li> <li>• <b>Hold</b>—traffic from your local network to the remote network can trigger the IOLAN to re-initiate the VPN connection over the detection timeout. We recommend that you use Hold when the remote peer uses a static IP address</li> <li>• <b>Restart</b>—re-initiate the VPN connection for three times over the detection timeout.</li> </ul> <p>Default Action is Hold            Interval is 30 seconds            Timeout is 120 seconds</p>

<b>ike-version</b> <b>ike</b>   <b>ikev1</b>   <b>ikev2</b>	Configure the IKE version. IKE uses IKEv2 but switches to IKEv1 depending on the peer. Default is IKEv2
<b>lifetime</b> <b>&lt;30-86400&gt;</b>	Configure the connection keep alive timer. Range is 30 to 86400. Default is 3600 seconds
<b>proposal</b> [ <b>dh-group</b> <b>2</b>   <b>5</b>   <b>14</b>   <b>15</b>   <b>16</b>   <b>17</b>   <b>18</b>   <b>19</b>   <b>20</b>   <b>21</b>   <b>22</b>   <b>23</b>   <b>24</b>   <b>25</b>   <b>26</b> ]   [ <b>encryption</b> <b>3des</b>   <b>aes128</b>   <b>aes128gcm128</b>   <b>aes256</b>   <b>aes256gcm256</b>	Configure the IKE/ESP proposal. Dh-default is 2. Encryption default is aes256. Hash default is SHA1
<b>Command Modes</b>	Perle(config-ike)#

### Usage Guidelines

Use this command to configure IKE parameters.

### Examples

Configures dead peer detection to restart.  
Perle(config-ike)# dpd action restart

### Related Commands

*show crypto*

### (config-12tp)

```
{client-ip-pool <A.B.C.D> <A.B.C.D> |
dns-server <1-2> <A.B.C.D> |
outside-address <A.B.C.D> |
pre-shared-key <WORD> |
username <WORD> password <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>client-ip-pool</b> <b>&lt;A.B.C.D&gt;</b> <b>&lt;A.B.C.D&gt;</b>	Configure L2TP client IP pool addresses to be used by the clients.
<b>dns-server</b> <b>&lt;1-2&gt;</b> <b>&lt;A.B.C.D&gt;</b>	Configure L2TP DNS servers.
<b>outside-address</b> <b>&lt;A.B.C.D&gt;</b>	Configure the L2TP server remote address.
<b>pre-shared-key</b> <b>&lt;WORD&gt;</b>	Configure the given pre-shared secret.

---

<b>username</b> <WORD> <b>password</b> <WORD>}	Configure L2TP user name and password for this connection.
--	--

---

<b>Command Modes</b>	Perle(config-l2tp)#
----------------------	---------------------

---

### Usage Guidelines

Use this command to configure L2TP connection parameters.

---

### Examples

Configure user name and password for L2TP connection.

```
Perle(config-l2tp)#username lyn password test
```

---

### Related Commands

*show crypto*

## dot11

```
{dot11 ssid <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

---

<b>Syntax Description</b>	<b>dot11</b>
---------------------------	--------------

---

{ssid <LINE>}	Configure wireless profile name. (Radio service ID)
---------------	---

---

<b>Command Modes</b>	Perle(config)#dot11
----------------------	---------------------

---

### Usage Guidelines

Use this command to configure a SSID name for a wireless channel profile.

---

### Examples

This example configures the SSID name to Testfloor1.

```
Perle(config)#dot11 ssid testfloor1
```

---

### Related Commands

**(config-ssid)#**

```
{authentication key-management wpa version 1 | 2 | both | open eap <WORD> | client-isolation |
```

```
encryption key size 108bit | 128bit | 40bit | 0 <hex-string> | 7 <WORD> | <hex-string> | mode cipher ccmp | tkip |
```

```
guest-mode |
```

```
max-associations <1-2007> |
```



**mgmt-frame-protection disable | mandatory | optional |**  
**wpa-psk ascii 0 <LINE> | 7 <WORD> | <LINE> }**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-ssid)#
	Configure SSID parameters.
	Configure this option to prevent low level bridging of frames between associated clients.
	Configure dot11 encryption parameters.
	Configure guest mode.
	Configure the number of clients connecting at the same time to this SSID.
	Configure Management Frame Protection (MFP). <b>Disabled</b> —no MFP negotiated <b>Mandatory</b> —clients must support MFP <b>Optional</b> —clients are allowed to associate only if MFP is negotiated (that is, if WPA2 is configured on the router and the client supports CCXv5 MFP and is also configured for WPA2)
	Configure the wireless protected access pre-shared key.
Command Modes	Perle(config-ssid)#

### Usage Guidelines

Use this command to configure parameters for IEEE802.11 WLAN.

### Examples

Configure the authentication method to allow WPA clients,  
 Perle(config-ssid)# authentication key-management wpa version both

### Related Commands

*dot11*

## dot1x

**dot1x**  
**{credential <WORD> |**  
**logging |**

**system-auth-control** |  
**test timeout** <1-65535>}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	dot1x
{ <b>credential</b> <WORD>	Configure a dot1x credential profile.
<b>logging</b>	Logs dot1x messages
<b>system-auth-control</b>	Enables dot1x system-auth-control for 802.1x access control on any port on the IOLAN. Set the port control command on each specific port you want 802.1x access control.
<b>test timeout</b> <1-65535>}	Use the readiness check before 802.1x is enabled on the IOLAN. Configure the EAPOL device timeout for the specified time frame.
<b>Command Modes</b>	Perle(config)#dot1x

### Usage Guidelines

Use this feature to determine if connected devices are 802.1x-capable.

### Examples:

This example creates a credential profile testcred, Enable dot1x authentication on Ethernet interfaces for multihost.

**Note: You must enable system -auth-control if you want to authenticate dot1x devices.**

```
Perle(config)#dot1x credential testcred
Perle(config)#interface ethernet 1
Perle(config-if)#authentication mult-auth
```

### Related Commands

*(config-dot1x-creden)*  
*show eee*

**(config-dot1x-creden)**  
 {**password** 0 <LINE> | 7 <LINE> | <LINE> |  
**username** <name>}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-dot1x-creden)
--------------------	-----------------------

<code>{password &lt;0&gt; &lt;LINE&gt;   &lt;7&gt; &lt;LINE&gt;  </code>	Configure a password. 0—specifies that an unencrypted password follows. 7—specifies that a hidden password follows.
--	---

<code>username &lt;WORD&gt;}</code>	Configure a user name.
-------------------------------------	------------------------

<b>Command Modes</b>	Perle(config-dot1x-creden)#
----------------------	-----------------------------

### Usage Guidelines

Use this command to configure dot1x credentials.

### Examples

This example configures the password "testing" to an encrypted password.

```
Perle(config)#dot1x credential testing
```

```
Perle(config-dot1x-creden)# password 7 DB0Uel1lynwOKW/j1
```

### Related Commands

*dot1x*

*show eee*

## eap

### eap

<code>{profile &lt;WORD&gt;}</code>	
-------------------------------------	--

Use the no form of this command to negate a command or set to defaults.

<b>Syntax Description</b>	<b>eap</b>
---------------------------	------------

<code>{profile &lt;WORD&gt;}</code>	Configure EAP profiles.
-------------------------------------	-------------------------

<b>Command Modes</b>	Perle(config)#eap
----------------------	-------------------

### Usage Guidelines

Use this command to create EAP profiles.

### Related Commands

*show eap*

*(config-eap-profile)*

### (config-eap-profile)

<code>{method gtc   leap   md5   mschapv2   peap   tls   [ttls chap   eap-gtc   eap-md5   eap-mschapv2   mschap   mschapv2   pap]  </code>	
--	--

<code>pki-trustpoint &lt;WORD&gt;}</code>	
---	--

Use the no form of this command to negate a command or set to defaults.

<b>Syntax Description</b>	<b>(config-eap-profile)</b>
---------------------------	-----------------------------

<b>{method gtc   leap   md5   mschapv2   peap   tls   [t]tls   chap   eap-gtc   eap-md5   eap-mschapv2   mschap   mschapv2   pap}  </b>	Configure the method of encapsulating sensitive information such as passwords to be authenticated from the IOLAN The certificate authority you must trust. This is a self-signed certificate that you create here <i>eap</i>
<b>pki-trustpoint &lt;WORD&gt;}</b>	Configure the default pki trustpoint.
<b>Command Modes</b>	Perle(config-eap-profiles)#

### Usage Guidelines

Use this command to configure parameters for EAP profiles.

EAP defines the transport and usage of identity credentials. EAP encapsulates the user names, passwords, certificates, and tokens for client authentication.

A trustpoint is a certificate authority you trust. Your IOLAN automatically trusts any other certificates signed with that trusted certificate

Create an eap profile before setting these parameters.

### Examples

This example sets the method to gtc.

```
Perle(config-eap-profiles)#method gtc
```

### Related Commands

*dot1x*

*show eap*

## email

### email

```
{enabled |
encryption none | ssl | tls |
from <WORD> |
recipient <WORD> | enable notifications-subject <LINE> | notifications alarms |
authentication | bgp | bridge | cellular-lte | dot11 | entity | envmon | interface-ip |
ipsec | lldp | network-watchdog | openvpn | osfp | smnp | software-update |
smtp-server <WORD> | <A.B.C.D> | <X:X:X:X::X:X> |
username <WORD> | password 0 <LINE> | 7 <WORD> | <LINE> |
validate-certificate}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	email
{enabled	Enables the email feature.

---

<b>encryption none   ssl   tls  </b>	Configure encryption. <ul style="list-style-type: none"> <li>• none</li> <li>• ssl</li> <li>• tls</li> </ul>
<b>from &lt;WORD&gt;  </b>	Configure from parameter. Format is user@company.com
<b>recipient &lt;WORD&gt;   enable notifications-subject &lt;LINE&gt;   notifications alarms   authentication   bgp   bridge   cellular-lte   dot11   entity   envmon   interface-ip   ipsec   lldp   network-watchdog   openvpn   ospf   snmp   software-update  </b>	Configure the recipient and receive notifications Format is: user@company.com Specify the email notifications. <ul style="list-style-type: none"> <li>• alarms</li> <li>• authentication</li> <li>• bgp</li> <li>• bridge</li> <li>• dot11</li> <li>• entity</li> <li>• envmon</li> <li>• interface-ip</li> <li>• ipsec</li> <li>• lldp</li> <li>• network-watchdog</li> <li>• openvpn</li> <li>• ospf</li> <li>• snmp</li> <li>• software-update</li> </ul>
<b>smtp-server &lt;WORD&gt;   &lt;A.B.C.D&gt;   &lt;X:X:X:X::X:X&gt;  </b>	Configure the SMTP server for mail requests.
<b>username &lt;WORD&gt;   password 0 &lt;LINE&gt;   7 &lt;WORD&gt;   &lt;LINE&gt;  </b>	Configure the username for server authentication.
<b>validate-certificate }</b>	Configure the validation email certificate.
<b>Command Modes</b>	Perle(config)#email

---

**Usage Guidelines**

Use this command to configure email notification parameters.

---

**Examples**

This example enables the email feature and configures the snmp server for email requests.

```
Perle(config)#email enabled
Perle(config)#email snmp-server 172.16.55.77
```

---

**Related Commands**

*show email*

**enable****enable**

```
{secret 0 <LINE> | 5 <LINE> | <LINE>}
```

Use the no form of this command to negate enable secret.

---

**Syntax Description****enable**

```
{secret 0 <LINE> | 5 <LINE>
| <LINE>}
```

Configure the enable password.  
0—Specifies an unencrypted password to follow  
5—Specifies a encrypted password to follow  
LINE—the unencrypted (cleartext) secret

---

**Command Modes**

Perle(config)#enable

---

**Usage Guidelines**

Use this command to configure the password to be used to enable privilege mode.

---

**Examples**

This example configures a password for enable mode.

```
Perle(config)#enable secret testsecret
```

---

**Related Commands**

*username*

**hostname**

```
hostname {<WORD>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****hostname**

```
{<WORD>}
```

Configure the IOLAN Nname.

---

**Command Modes**

Perle(config)#hostname

---

**Usage Guidelines**

Use this command to configure the hostname.

---

**Examples**

This example configures the IOLAN's name to TestHost.

```
Perle(config)#hostname TestHost
```

```
TestHost(config)#
```

**interface****interface**

```
{bvi <1-9999> |  
cellular <0-0> |  
dialer <0-15> |  
dot11radio <0-4> |  
ethernet <1-2> . <1-4000> |  
openvpn-tunnel <0-999> tap | tun |  
tunnel <0-999> |  
range ethernet }
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****interface**

```
{bvi <1-9999> |
```

Configure the bridge interface.  
See [\(config-if\)#bvi](#)

```
dialer <0-15> |
```

Configure the dialer interface.  
See [\(config-if\)#dialer](#)

Configure the wireless interface.  
See [\(config-if\)#dot11radio](#)

```
ethernet <1-2> |
```

Configure the Ethernet interface.  
See [\(config-if\)#ethernet](#)

```
openvpn-tunnel <0-999> tap |  
tun |
```

Configure an OpenVPN tunnel.  
See [\(config-if\)#openvpn-tunnel](#)

```
tunnel <0-999> |
```

Configure the tunnel.  
See [\(config-if\)#tunnel](#)

```
range ethernet <1-2> }
```

Configure an Ethernet range.  
See [\(config-if-range\)#](#)

---

**Command Modes**

Perle(config)#interface ethernet 1  
Perle(config-if)#

---

**Usage Guidelines**

Use this command to configure an interface.

---

**Examples**

This example configures parameters for Ethernet interface 1.  
 Perle(config)#interface ethernet 1

---

**Related Commands**

*(config-if)#bvi*  
*(config-if)#dialer*  
*(config-if)#openvpn-tunnel*  
*(config-if)#tunnel*  
*(config-if-range)#*  
*(config-subif)#*  
*(config-if-vrrp)#*

**ip access-list**

**ip access-list** { **extended** <100-199> | <2000-2699> | **resequence extended** <100-199><1-65535> | <2000-2699> <1-65535> } | **standard** <1-99> | <1300-1999> }

Use the no form of this command to negate enable.

Syntax Description	ip access-list
{ <b>extended</b> <100-199>   <2000-2699>	Configure an IP access list number. See <i>(config-ext-nacl)</i>
<b>resequence extended</b> <100-199><1-65535>   <2000-2699> <1-65535> }   <b>standard</b> <1-99> <1-65535> <1300-1999> <1-65535>	Configure resequence IP Access list. Entries are numbered sequentially, starting from 10 and in intervals of 10.
<b>standard</b> <1-99>   <1300-1999> }	Configure an IP access list number. See <i>(config-std-nacl)</i>
<b>Command Modes</b>	Perle(config)#ip access-list

**Usage Guidelines**

Use IP Access Control Lists (ACLs) to define rules for controlling the network traffic and reducing network attacks. You can filter traffic based on sets of rules defined for the incoming traffic or outgoing traffic. Access lists look from the top list entry to bottom list entry.. Be sure when creating access lists that the most important entries are at the top of the list.



---

## Examples

Displays ACL definitions. You will note that there is no available space to add an entry within this list. Using the resequence command you can resequence these ACL entries.

Standard IP access list Moo.

```
10 deny host 1.1.1.1
```

```
20 deny host 2.2.2.2
```

```
30 permit 3.3.3.3
```

```
40 permit 4.4.4.4
```

To resequence this ACL list to start at 20 and then resequence each entry by 20's use:

```
Perle(config)#ip access-list resequence Moo 20 20
```

Standard IP access list Moo.

```
20 deny host 1.1.1.1
```

```
40 deny host 2.2.2.2
```

```
60 permit 3.3.3.3
```

```
80 permit 4.4.4.4
```

---

You now have space between the entries to add entries.

**Note:** Resequence numbering is lost on a reboot, therefore you must copy running-config to startup-config for these changes to be permanently saved.

---

## Related Commands

[\(config-std-nacl\)](#)

[\(config-ext-nacl\)](#)

### (config-std-nacl)

```
{<1-65535> deny | permit <A.B.C.D>/hostname> <A.B.C.D>/hostname> | any |
host <A.B.C.D>/hostname>}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

### (config-std-nacl)

```
{<1-2147483647> deny | permit
```

```
<A.B.C.D>/hostname>
```

```
<A.B.C.D>/hostname> | any |
```

```
host<A.B.C.D>/hostname>}
```

Configure standard access lists.

---

### Command Modes

Perle(config-std-nacl)#

---

### Usage Guidelines

Configure packets to reject or accept.

---

**Examples**

This example permits packets from this host.

```
Perle(config-std-nacl)#permit host 172.16.77.88
```

**(config-ext-nacl)**

```
{<1-65535> | {deny ip | permit ip <A.B.C.D>/hostname> <A.B.C.D>/hostname> |  
any | host <A.B.C.D>/hostname>}}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-ext-nacl)**

---

```
{<1-65535> | {deny ip |  
permit ip  
<A.B.C.D>/hostname>  
<A.B.C.D>/hostname> | any |  
host <A.B.C.D>/hostname>}}
```

Configure sequence numbers and permits or denies packets.

---

**Command Modes**

Perle(config-ext-nacl)#

---

**Usage Guidelines**

Configure sequence number and define packets to permit or deny.

---

**Examples**

This example permits packets from source host 172.16.77.88 and destination host any (host).

```
Perle(config-ext-nacl)#permit ip host 172.16.77.88 any
```

**ip alg****ip alg**

```
{modules ftp | gre | h323 | nfs | pptp | sip | sqlnet | tftp | disable}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ip alg**

---

```
{alg modules ftp | gre | h323 |  
nfs | pptp | sip | sqlnet | tftp |  
disable}
```

Configure Application Level Gateway (ALG) modules.

---

**Command Modes**

Perle(config)#ip alg

---

### Usage Guidelines

Use this command to configure client applications to communicate with known ports used by server applications. ALG allows customized NAT traversal filters to be plugged into the gateway to support address and port translation for protocols such as FTP, BitTorrent, SIP, RTSP, and file transfer etc. In order for these protocols to work through NAT or a firewall, either the application has to know about an address/port number combination that allows incoming packets, or the NAT has to monitor the control traffic and open up port mappings (firewall pinhole) dynamically as required. Application data is passed through the security checks of the firewall or NAT that would have otherwise been restricted. Without an ALG, the ports would either get blocked, or the network administrator would need to open up a large number of ports in the firewall, weakening the network and allowing potential attacks on those ports.

By default all alg modules are enabled.

---

### Examples

This example disables ALG module ftp.

```
Perle(config)#no ip alg modules ftp disable
```

## ip as-path

### ip as-path

```
{access-list <WORD> <1-65535> deny | permit <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

#### ip as-path

<pre>{as-path access-list &lt;WORD&gt; &lt;1-65535&gt; deny   permit &lt;LINE&gt;}</pre>	Configure access list parameters.
--	-----------------------------------

---

#### Command Modes

Perle(config)#ip as-path

---

### Usage Guidelines

Use this command to configure an access-list filters for Border Gateway Protocol (BGP) autonomous system (AS) numbers. You can use AS Path filters, either inbound or outbound, to filter either the routes you send or the routes you receive, respectively. You must apply these filters to each peer separately. Regular expressions are strings of special characters used to search and find character patterns.

---

Regular expression for *<LINE>* include:

CHAR	USAGE
^	Start of string
\$	End of string
[]	Range of characters
-	Used to specify range (i.e [0-9] )
()	Logical Grouping
.	Any single character
*	Zero or more instances
+	On or more instance
?	Zero or more instance

Expression	Meaning
.	Anything
^\$	Locally originated routes
^100_	Learned from AS 100
_100\$	Originated in AS 100
_100_	Any instance of AS 100
^[0-9]+\$	Directly connected ASes

---

### Examples

This example accepts prefixes that originated in AS 3299, all other prefixes won't be permitted.

```
Perle(config)#ip as-path access-list 1 permit ^3299$
```

---

### Related Commands

*(config-remote-mgmt)*

*show ip as-path-access-list*

## ip community-list

### ip community-list

```
{expanded <100-500> <1-65535> deny <LINE> | permit <LINE> |
standard <1-99> <1-65535> deny <1-4294967295> | internet | local-as | no-
advertise | no-export | permit <1-4294967295> | internet | local-as | no-advertise |
no-export | permit <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

```
{expanded <100-500> <1-65535> deny
<LINE> | permit <LINE> |
```

---

### ip community-list

Configure an extended community list. You can configure up to 32 communities.

---

**standard** <1-99> <1-65535> **deny** <1-4294967295> | **internet** | **local-as** | **no-advertise** | **no-export** | **permit** <1-4294967295> | **internet** | **local-as** | **no-advertise** | **no-export** | **permit** <LINE>

Configure a standard community list.

You can configure up to 16 communities.

---

### Command Modes

Perle(config)#ip community-list

---

### Usage Guidelines

Use this command to configure a BGP community list and to control which routes are permitted or denied based on their community values.

Standard community lists are used to configure well-known communities and specific community numbers. You can pick more than one of the optional community keywords.

Expanded community lists are used to filter communities using a regular expression. Regular expressions are used to configure patterns to match community attributes

CHAR	USAGE
^	Start of string
\$	End of string
[]	Range of characters
-	Used to specify range (i.e [0-9] )
()	Logical Grouping
.	Any single character
*	Zero or more instances
+	On or more instance
?	Zero or more instance

Expression	Meaning
*	Anything
^\$	Locally originated routes
^100_	Learned from AS 100
_100\$	Originated in AS 100
_100_	Any instance of AS 100
^[0-9]+\$	Directly connected ASes

---

### Examples

This example configures a standard community list that denies routes that carry communities from network 40 in autonomous system 65540 and from network 60 in autonomous system 65550. This example shows a logical AND condition; all community values must match in order for the list to be processed.

```
Perle(config)#ip community-list standard test1 deny 65540:40 65550:60
```

---

### Related Commands

*router*

## ip default-gateway

### ip default-gateway

```
{default-gateway <A.B.C.D>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	ip default-gateway
{default-gateway <A.B.C.D>}	Configure the IP address of the default gateway.
Command Modes	Perle(config)#ip default-gateway

### Usage Guidelines

Use this command to configure a default gateway.

### Examples

This example configures a gateway address of 172.16.1.1.

```
Perle(config)#ip default-gateway 172.16.1.1
```

## ip dhcp

### ip dhcp

```
{dhcp excluded-address <A.B.C.D> | pool <NAME> |  
relay information hop-count <1-255> | packet-size <64-1400> | policy drop |  
encapsulate | keep | replace | port <1-65535> | server <A.B.C.D>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	ip dhcp
{dhcp excluded-address <A.B.C.D>   pool <NAME>	Configure Dynamic Host Configuration Protocol (DHCP) to exclude an address range. Configure DHCP pools.
relay information hop-count <1-255>   packet-size <64-1400>   policy drop   encapsulate   keep   replace   port <1-65535>   server <A.B.C.D>}	Configure Relay Agent parameters.
Command Modes	Perle(config)#ip dhcp

### Usage Guidelines

Use this command to have the DHCP server automatically assign an IP address and other IP parameters to devices on your network.

### Examples

This example excludes ip address 172.16.55.99 from the DHCP pool.

```
Perle(config)#ip dhcp exclude address 172.16.55.99
```

**Related Commands***(config-dhcp)***(config-dhcp)**

```

{address <A.B.C.D> hardware-address <H.H.H> |
authoritative enable |
bootfile <WORD> |
default-router <A.B.C.D>/hostname |
description <LINE> |
dns-server <A.B.C.D>/hostname |
domain-name <WORD> |
enable |
lease <0-365> <0-23> <0-59> | infinite |
network </nn | A.B.C.D> start <A.B.C.D> stop <A.B.C.D> |
option <1-254> ascii <LINE> | hex <hex-string> | ip <A.B.C.D>/hostname |
static-route <A.B.C.D> <A.B.C.D> <A.B.C.D>}

```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-dhcp)**

<b>{address &lt;A.B.C.D&gt; hardware-address &lt;H.H.H&gt;  </b>	Configure the IP address to reserve for this client. This IP address is only assigned to the client with this hardware address.
<b>authoritative enable  </b>	Configure the authoritative parameter. This parameter must be set to enable if this is the only DHCP server on your network. Authoritative mode allows roaming clients to get a new DHCP address even if their lease has been assigned from another network and is still valid (lease has not expired) This prevents a client lock out situation.
<b>bootfile &lt;filename&gt;  </b>	Configure the IP address or name of a TFTP server and boot file name to allow client auto-configuration.
<b>default-router &lt;A.B.C.D&gt;  </b>	Configure the default router to use after a DHCP client has booted. The IP address of the default router should be on the same subnet as the client.
<b>description &lt;pool-name&gt;  </b>	Configure DHCP pool name description.

<b>dns-server</b> <A.B.C.D>	Configure a DNS server for use by clients using this DHCP pool. A DNS server needs to be specified if you want to browse the Internet.
<b>domain-name</b> <A.B.C.D>	Configure a domain name.
<b>enable</b>	Enables this dhcp pool.
<b>lease</b> <0-365> <0-23> <0-59>   <b>infinite</b>	Configure a lease time for client connecting using this DHCP pool. Typically 24 lease times are suitable, however if your situation is a public hotspot then shorter time be warranted.
<b>network</b> </nn   A.B.C.D> <b>start</b> <A.B.C.D> <b>stop</b> <A.B.C.D>	Configure the network, start and stop IP addresses for DHCP lease ranges.
<b>option ascii</b> <string>   <b>hex</b> <hex-string>   <b>ip</b> <A.B.C.D>	Configure DHCP options to send to the client.
<b>static-route</b> <A.B.C.D> <A.B.C.D> <A.B.C.D> }	Configure a static route.
<b>Command Modes</b>	Perle(config)#

### Usage Guidelines

Use this command to configure DHCP parameters.

### Examples

This example sets authoritative mode to enable.

```
Perle(config-dhcp)#ip authoritative enable
```

### Related Commands

[\*ip dhcp\*](#)

## ip dns

### ip dns

```
{ dns cache-size <1-10000> | domain <NAME> server <A.B.C.D> <X:X:X:X::X>
| ignore-hosts-file
| listen-address <A.B.C.D> | <X:X:X:X::X>
| negative-ttl <0-7200> }
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description** [\*\*ip dns\*\*](#)



<b>{dns cache-size &lt;1-10000&gt;  </b>	Configure the size of the DNS cache. Values are 1 to 10000 Default is 10000
<b>domain &lt;NAME&gt; server &lt;A.B.C.D&gt; &lt;X.X.X.X::X&gt;  </b>	Configure the domain name to forward to a custom DNS server.
<b>ignore-hosts-file  </b>	Configure the parameter—Do not use the local /etc/hosts file for name resolution.
<b>listen-address &lt;A.B.C.D&gt; &lt;X.X.X.X::X&gt;  </b>	Configure the parameter to listen for DNS addresses on the following IP addresses.
<b>negative-ttl &lt;0-7200&gt;}</b>	Configure the seconds to cache NXDOMAIN entries. Values are 0–7200 seconds Default is 3600 seconds
<b>Command Modes</b>	Perle(config)#ip dns

### Usage Guidelines

Use this command to configure parameters for DNS.

### Examples

This example sets listen address to 172.16.77.88.

```
Perle(config)#ip dns listen-address 172.16.77.88
```

### Related Commands

*ip domain*

*ip domain-name*

## ip domain

### ip domain

**{domain lookup}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	ip domain
--------------------	-----------

**{domain lookup}**

Enables DNS host name to IP address translation.

**Command Modes**

Perle(config)#ip domain

### Usage Guidelines

Use the ip domain-lookup command to enable DNS host name-to-IP address translation on the IOLAN.

---

**Examples**

This example enables DNS host to IP address translation.

```
Perle(config)#ip domain
```

---

**Related Commands**

*ip domain-name*

## ip domain-name

**ip domain-name**

```
{domain-name <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ip domain-name**

```
{domain-name <WORD>}
```

Configure the domain name.

---

**Command Modes**

Perle(config)#ip domain-name

---

**Usage Guidelines**

Use this command to configure the default domain name.

---

**Examples**

This example sets domain name to testlab.

```
Perle(config)#ip domain-name testlab
```

---

**Related Commands**

*ip domain*

## ip extcommunity-list

**ip extcommunity-list**

```
{extcommunity-list expanded <100-500> <1-65535> deny <LINE> | permit  
<LINE> |
```

```
standard <1-99> <1-65535> deny rt | soo | asn:nn}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ip extcommunity-list**

```
{extcommunity-list expanded  
<100-500> <1-65535> deny  
<LINE> | permit <LINE> |
```

Configure an extended community list entry.

```
standard <1-99> <1-65535>
deny rt | soo asn:nn }
```

Configure a standard community list entry.

**soo**—The site-of-origin (SoO) extended community is a BGP extended community attribute used to identify routes that have originated from a site so that the readvertisement of that prefix back to the source site is prevented. BGP uses the SoO value associated with a route to prevent routing loops.

**rt**—The route target BGP Extended Community dictates the policies used by the Virtual routing and forwarding (VRF). The route target must be configured to specify the routes, which contain this specific route target value, that are imported into the VRF, and the route target that is added to the routes that are exported from the (VRF).

---

#### Command Modes

Perle(config)#ip extcommunity-list

---

#### Usage Guidelines

This command defines a new standard extcommunity-list.

---

#### Examples

This example configures a standard community list where the routes with this community are advertised to all peers (internal and external).

```
Perle(config)#ip extcommunity-list
```

---

#### Related Commands

*show ip extcommunity-list*

## ip firewall

```
ip firewall
{ firewall <WORD> |
all-ping enable |
broadcast-ping enable |
ip-src-route enable |
ipv6-receive-redirects enable |
ipv6-src-route |
log-martians enable |
receive-redirects enable |
send-redirects enable |
source-validation disable | loose | strict |
```

**state-policy established accept | drop | reject invalid accept | drop | reject | related action accept | drop | reject | syn-cookies enable | twa-hazards-protection enable }**

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>ip firewall</b>	
<b>{ firewall &lt;WORD&gt;  </b>	Creates a firewall set of rules. Firewall name cannot be the same as route-policy name.
<b>all-ping enable  </b>	Configure the handling of IPv4 ICMP Echo requests. <b>Enable</b> —system responses to IPv4 ICMP Echo requests. <b>Disable</b> —system does not respond to IPv4 ICMP Echo requests Default is Disabled
<b>broadcast-ping enable  </b>	Configure the handling of IPv4 ICMP echo and timestamps requests. <b>Enable</b> —system responses to broadcast IPv4 ICMP echo and timestamp requests <b>Disable</b> —system does not respond to IPv4 echo and timestamp requests Default is Disabled
<b>ip-src-route enable  </b>	Configure the handling of IPv4 packets with source route option. Default is Disabled
<b>ipv6-receive-redirects enable  </b>	Configure the handling of received IPv6 ICMP redirect messages. Default is Disabled
<b>ipv6-src-route  </b>	Configure the handling of IPv6 packets with routing extension header. Default is Disabled
<b>log-martians enable  </b>	Configure the handling of IPv6 packets with routing extension header. Default is Disabled
<b>receive-redirects enable  </b>	Configure the handling of received IPv4 ICMP redirect messages. Permits or denies IPv4 ICMP redirect messages. Default is Disabled

<b>send-redirects enable</b>	Configure the sending of IPv4 only redirect messages. Default is enabled
<b>source-validation disable</b>   <b>loose</b>   <b>strict</b>	Configure source validation (IPv4 only). <b>Disable</b> —no source validation is performed <b>Loose</b> —enable loose reverse path forwarding as defined by RFC3704 <b>Strict</b> —enable strict reverse path forwarding as defined in RFC3704 Default is Disabled
<b>state-policy established accept</b>   <b>drop</b>   <b>reject invalid accept</b>   <b>drop</b>   <b>reject</b>   <b>related action</b>   <b>accept</b>   <b>drop</b>   <b>reject</b>	Configure the global firewall state policy for both IPv4 and IPv6. By default, the firewall is stateless, configuring any of these options makes the firewall become stateful. <ul style="list-style-type: none"> <li>• a firewall state policy is configured</li> </ul>
<b>state-policy established accept</b>   <b>drop</b>   <b>reject invalid accept</b>   <b>drop</b>   <b>reject</b>   <b>related action</b>   <b>accept</b>   <b>drop</b>   <b>reject</b>	<ul style="list-style-type: none"> <li>• NAT is configured</li> <li>• The transport web proxy service is enable</li> <li>• A load-balancing configuration is enable</li> </ul> Default is none (not set)
<b>syn-cookies enable</b>	Configure the policy for using TCP SYN cookies with IPv4. Default is enabled
<b>twa-hazards-protection enable</b> }	Configure for TCP TIME_WAIT assassination hazards protection per RFC 1337.

**Command Modes**

Perle(config)#ip firewall

**Usage Guidelines**

Use this command to configure firewall global configuration parameters.

**Examples**

This example configures the IOLAN to answer all incoming ping requests.

Perle(config)#ip firewall all-ping enable

**Related Commands***show ip firewall**clear ip**show ipv6***(config-fw)**{ **default-action accept** | **drop** | **reject** |

```
description <LINE> |
enable default-log |
rule <1-9999>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-fw)
{default-action accept   drop   reject		Configure the default action for the entire firewall.
description <LINE>		Configure firewall rule description.
enable default-log		Enables log packets matching the default-action <b>Note:</b> To see logging, turn on kernel debug. <config># debug kernel
rule <1-9999>}		Configure the number for this rule, then enters sub-menu. (config-fw-rules).
<b>Command Modes</b>		Perle(config-fw)#

### Usage Guidelines

Creates a firewall set of rules with the given name.

### Examples

This example configures the default log action to enable. See show logging for output.

```
erle(config-fw)#enable-default-action
```

This example create rule 1, then enters sub-menu mode (config-fw-rules).

```
Perle(config-fw)#rule 1
```

```
Perle(config-fw-rules)#
```

### Related Commands

*show ip firewall*

*clear ip*

*show ipv6*

*show lldp*

*(config-fw-rules)*

*ip firewall*

### (config-fw-rules)

```
{description <LINE> |
disable <LINE> |
log enabled |
match destination address <A.B.C.D> <A.B.C.D> | not <A.B.C.D> <A.B.C.D>
start <A.B.C.D> stop <A.B.C.D> port <A.B.C.D> <A.B.C.D> | not <A.B.C.D>
```

**<A.B.C.D> start <A.B.C.D> stop <A.B.C.D> | fragment | non-fragment | icmp  
 type <0-255> code <0-255> | type-name tos-host-redirect | tos-network-redirect |  
 address-mask-reply | address-mask-request | communication-prohibited |  
 destination-unreachable | echo-reply | echo-request | fragmentation needed |  
 host-precedence-violation | host-redirect | host-unknown | host-unreachable |  
 network-redirect | network-unknown | parameter-problem | port-unreachable |  
 protocol-unreachable | redirect | required-option-missing | router-advertisement  
 | router-solicitation | source-quench | source-route-failed | time-exceeded |  
 timestamp-reply | timestamp-request | ipsec | non-ipsec | protocol <0-255> | ah |  
 dccp | dsr | egp | eigrp | encap | esp | etherip | ggp | gre | hmp | icmp | idpr | igmp |  
 igp | ip | ipip | ipv6 | ipc6-frag | ipv6-icmp | ipv6-nonxt | ipv6-opts | ipv6-route |  
 isis | l2tp | manet | mpls-in-ip | narp | pim | rdp | roch | rvsd | sctp | shim6 | skip |  
 tcp | udp | udplite | vrrp | xns-idp || recent count <1-255> | time <1-4294967295> |  
 source address <A.B.C.D> <A.B.C.D> not <A.B.C.D> <A.B.C.D> start  
 <A.B.C.D> stop <A.B.C.D> | mac-address <H.H.H> not <H.H.H> | port <1-  
 65535> not <1-65535> start <1-65535> stop <1-65535> | state established |  
 invalid | new | related | tcp-flags ack | all | fin | sh | rst | syn | urg | not |  
 set action accept | drop | reject |  
 time monthdays <1-31> not <1-31> | startdate january | february | march | april  
 | may | june | july | august | september | november | december day <1-31> year  
 <2001-2037> | starttime <hh:mm:ss> | stopdate january | february | march | april  
 | may | june | july | august | september | november | december | stoptime  
 <hh:mm:ss> | utc | weekdays monday | tuesday | wednesday | thursday | friday |  
 saturday | sunday | not monday | tuesday | wednesday | thursday | friday |  
 saturday | sunday }**

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-fw-rules)
{description <LINE>		Configure a description for the policy rule.
disable <LINE>		Disables policy rule.
log enabled		Enables log packets matching the rule.

```

match destination address
<A.B.C.D> <A.B.C.D> | not
<A.B.C.D> <A.B.C.D> start
<A.B.C.D> stop <A.B.C.D>
port <A.B.C.D> <A.B.C.D> |
not <A.B.C.D> <A.B.C.D>
start <A.B.C.D> stop
<A.B.C.D> | fragment | non-
fragment | icmp type <0-255>
code <0-255> | type-name tos-
host-redirect | tos-network-
redirect | address-mask-reply
|address-mask-request |
communication-prohibited |
destination-unreachable |
echo-reply | echo-request |
fragmentation needed | host-
precedence-violation | host-
redirect | host-unknown | host-
unreachable | network-
redirect | network-unknown |
parameter-problem | port-
unreachable | protocol-
unreachable | redirect |
required-option-missing |
router-advertisement | router-
solicitation | source-quench |
source-route-failed | time-
exceeded | timestamp-reply |
timestamp-request | ipsec |
non-ipsec | protocol <0-255> |
ah | dccp | dsr | egp | eigrp |
encap | esp | etherip | ggp | gre
| hmp | icmp | idpr | igmp | igp
| ip | ipip | ipv6 | ipc6-frag |
ipv6-icmp | ipv6-nonxt | ipv6-
opts | ipv6-route | isis | l2tp |

```

Configure firewall rules to match conditions for traffic and the action to be taken if the match conditions are satisfied. Traffic matches on a number of characteristics, including source IP address, destination IP address, source port, destination port, IP protocol, and ICMP type. Rules are executed in sequence, according to the rule number. If the traffic matches the characteristics specified by the rule, the rule's action is executed; if not, the system "falls through" to the next rule.



---

```

manet | mpls-in-ip | narp | pim
| rdp | roch | rvsp | sctp | shim6
| skip | tcp | udp | udplite |
vrrp | xns-idp || recent count
<1-255> | time <1-
4294967295> | source address
<A.B.C.D> <A.B.C.D> not
<A.B.C.D> <A.B.C.D> start
<A.B.C.D> stop <A.B.C.D> |
mac-address <H.H.H> not
<H.H.H> | port <1-65535> not
<1-65535> start <1-65535>
stop <1-65535> | state
established | invalid | new |
related | tcp-flags ack | all | fin
| sh | rst | syn | urg | not |

```

---

```

set action accept | drop | reject

```

Action for packets.

The action is one of the following:

- Accept—Traffic is allowed and forwarded.
- Drop—Traffic is silently discarded.
- Reject—Traffic is discarded with an ICMP “Port Unreachable” message.
- Inspect—Traffic is processed by the intrusion protection system (IPS).

---

```

time monthdays <1-31> not
<1-31> | startdate january |
february | march | april | may |
june | july | august | september
| november | december day
<1-31> year <2001-2037> |
starttime <hh:mm:ss>|
stopdate january | february |
march | april | may | june |
july | august | september
||november | december |
stoptime <hh:mm:ss> | utc |
weekdays monday | tuesday |
wednesday | thursday | friday
saturday | sunday | not
monday | tuesday | wednesday
| thursday | friday | saturday |
sunday|

```

Configure time schedule to match rules.

---

Command Modes

---

Perle(config-fw-rules)#

---

## Usage Guidelines

Use this command to create firewalls filter packets on interfaces.

There are two steps to create a firewall.

1. You define a firewall instance and save it under a name. A firewall instance is also called a firewall rule set, where a rule set is just a series of firewall rules. You define the firewall instance and configure the rules for its rule set in the firewall configuration node.

2 After defining the instance and specifying the rules in the rule set, you apply the instance to an interface or a zone. You do this by configuring the interface configuration node for the interface or zone. Once the instance is applied to the interface or zone, the rules in the instance begin filtering packets.

---

## Examples

The example below applies firewall name set test to the inbound traffic on BV1 (bridging eth1 and eth2). This firewall drops all ICMP traffic (generated by ping commands), but allows all other traffic such as TCP Web traffic) because the default action is accept.

```
Perle(config)#ip firewall test
Perle(config-fw)#default-action accept
Perle(config-fw)#rule 1
Perle(config-fw-rules)#set action drop
Perle(config-fw-rules)#match protocol icmp
```

---

```
Perle(config-fw)#rule 2
Perle(config-fw-rules)#set action accept
Perle(config-fw-rules)#match protocol tcp
Perle(config)#interface ethernet 1
Perle(config)#bridge-group 1
Perle(config)#interface ethernet 2
Perle(config)#bridge-group 1
```

---

## Related Commands

*show ip firewall*

*clear ip*

*show ipv6*

*(config-fw)*

## ip ftp

### ip ftp

{**ftp passive** | **password 0** <LINE> | **7** <WORD> | <LINE> | **username** <WORD>}

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

**ip ftp**

---

```
{ftp passive | password 0
<LINE> | 7 <WORD> |
<LINE> | username
<WORD>}
```

Configure File Transfer Protocol (FTP) parameters.

Passive—indicates to the server that the client is opening the file transfer session. This option is used if the client is behind a firewall.

---

#### Command Modes

Perle(config)#ip ftp

---

#### Usage Guidelines

Use this command to configure File Transfer Protocol (FTP) parameters.

---

#### Examples

This example set username to labuser.

```
Perle(config)#ip ftp username labuser
```

## ip health

### ip health

```
{profile <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

#### ip health

```
{profile <WORD>}
```

Configure an IP Health Profile. See [\(config-health-prof\)](#) for more information.

---

#### Command Modes

Perle(config)#ip health

---

#### Usage Guidelines

Use this command to create a health profile.

---

#### Examples

This example creates a health profile called labhealth.

```
Perle(config)#ip health profile labhealth
```

---

#### Related Commands

[\(config-health-prof\)](#)

*show ip health*

### (config-health-prof)

```
{failure-count <1-10> | success-count | test <1-100> target <hostname X.X.X.X>
type ping response-timeout <1-30> | traceroute limit <1-254>}
```

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

#### (config-health-prof)

```
{failure-count <1-10> | success-count |
test target <hostname X.X.X.X> type
ping response-timeout <1-30> |
traceroute limit <1-254>}
```

Test <1-100>—Prioritize health test 1=first.

- Failure test count before marking failed
- Count failure before marking as failed
- Count successes before marking as active
- Configure a health test

---

#### Command Modes

Perle(config-health-prof)#

---

#### Usage Guidelines

Use this command to configure health tests.

---

#### Examples

This example creates a health test to ping host 172.16.77.4 10 times  
 Perle(config-health-prof)#test target 10 172.16.77.4

## ip host

### ip host

```
{host <WORD> <A.B.C.D>}
```

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

#### ip host

```
{host <WORD> <A.B.C.D>}
```

Configure a host to add to the host table.

---

#### Command Modes

Perle(config)#ip host

---

#### Usage Guidelines

Use this command to add a host to the IOLAN internal host table.

---

#### Examples

This example adds host labhost with ip address of 172.16.99.10 to the host table.  
 Perle(config)#ip host labhost 172.16.99.10

---

#### Related Commands

*show hosts*

## ip host-group

### ip host-group

```
{host <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	<b>ip host-group</b>
<b>{host &lt;WORD&gt;}</b>	Configure the host group name.
<b>Command Modes</b>	Perle(config)#ip host
<b>Usage Guidelines</b>	
Use this command to create a host group. A host group is a list of hosts.	
<b>Examples</b>	
This example creates host group hosts_for_labs. Perle(config)#ip host-group hosts_for_labs	
<b>Related Commands</b>	
<i>(config-host-group)</i>	

### **(config-host-group)**

**{host <A.B.C.D> | <WORD> | <X:X:X:X::X>}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	<b>(config-host-group)</b>
<b>{host &lt;A.B.C.D&gt;   &lt;WORD&gt;   &lt;X:X:X:X::X&gt;}</b>	Configure a host to add to the host group.
<b>Command Modes</b>	Perle(config-host-group)#
<b>Usage Guidelines</b>	
Use this command to add a host to the host group.	
<b>Examples</b>	
This example adds host 172.17.55.90 to host group. Perle(config-host-group)#host 172.17.55.90	
<b>Related Commands</b>	
<i>ip host-group</i>	

## **ip http**

### **ip http**

**{accounting exec <WORD> | default} |  
authentication aaa login-authentication <WORD> | default} |**

```

client password 0 <LINE> | 7 <WORD> | <LINE> proxy-server <WORD> proxy-
port <1-65535> | secure-trust-point <WORD> | username <WORD> | verify-
server |
local port 80 | <1025-65535> |
secure-port 443 | <1025-65535> |
secure-server |
server |
session-idle-timeout <1-1440>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>ip http</b>	
{ <b>accounting exec</b> <WORD>   <b>default</b>   }	Configure HTTP server accounting parameters.
<b>authentication aaa login-authentication</b> <WORD>   <b>default</b>   }	Configure HTTP server authentication method.
<b>client password</b> 0 <LINE>   7 <WORD>   <LINE> <b>proxy-server</b> <WORD> <b>proxy-port</b> <1-65535>   <b>secure-trust-point</b> <WORD>   <b>username</b> <WORD>   <b>verify-server</b>   }	Configure HTTP client certificate secure trustpoint.
<b>local port</b> 80   <1025-65535>   }	Configure a HTTP server local port number for listening. Values are 1025 to 65535 Default is 80
<b>secure-port</b> 443   <1025-65535>   }	Configure a HTTPS server port for listening. Values are 1025 to 65535 Default is 4430
<b>secure-server</b>   }	Enable HTTP secure server.
<b>server</b>   }	Enable HTTP server.
<b>session-idle-timeout</b> <1-1440> }	Configure a HTTP server session idle timeout. Default session idle timeout is 1440 seconds.
<b>Command Modes</b>	Perle(config)#ip http

### Usage Guidelines

Use this command to configure HTTP/S server parameters.

---

**Examples**

This example enables HTTP secure server.

```
Perle(config)#ip http secure-server
```

---

**Related Commands**

*show ip http*

**ip name-server****ip name-server**

```
{name-server <A.B.C.D>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ip name-server**

```
{name-server <A.B.C.D>}
```

Configure the address of the name server.

---

**Command Modes**

Perle(config)#ip name-server

---

**Usage Guidelines**

Use this command to configure the nameserver. Nameserver is a server that handles queries regarding the location of a domain name's various services such as website, emails and so on. It is also a part of the Domain Name System (DNS) which maintains a directory of domain names and translate them to IP addresses. When you visit a domain, a DNS lookup first checks its name servers and reviews the DNS records for that domain accordingly.

---

**Examples**

This example set name-server to 172.16.44.55.

```
Perle(config)#ip name-server 172.16.44.55
```

**ip nat****ip nat**

```
{nat inside source any | list <1-199> interface bvi <1-9999> | dialer <0-15>  
dot11radio <0-4> ethernet <1-2> openvpn <0-999> | tunnel <0-999> | over load |  
no-strict | static tcp | tcp+udp | udp <A.B.C.D> <1-65535> inbound-interface bvi  
<1-9999> | dialer <0-15> ethernet <1-2> openvpn <0-999> | tunnel <0-999> <1-  
65535> <A.B.C.D> <A.B.C.D> |  
pool <WORD> <A.B.C.D> <A.B.C.D> netmask <A.B.C.D>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ip nat**

<pre>{nat inside source any   list &lt;1-199&gt; interface bvi &lt;1- 9999&gt;   dialer &lt;0-15&gt; dot11radio &lt;0-4&gt; ethernet &lt;1- 2&gt; openvpn &lt;0-999&gt;   tunnel &lt;0-999&gt;   over load   no-strict   static tcp   tcp+udp   udp &lt;A.B.C.D&gt; &lt;1-65535&gt; inbound-interface bvi &lt;1- 9999&gt;   dialer &lt;0-15&gt; dot11radio &lt;0-4&gt; ethernet &lt;1- 2&gt; openvpn &lt;0-999&gt;   tunnel &lt;0-999&gt; &lt;1-65535&gt; &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;  </pre>	<p>Configure Network Address Translation (NAT).</p> <p>Use NAT when your IOLAN is on a private network and your internal PCs want to browse the Internet.</p> <p>No—strict—do not turn on firewall to drop invalid connections</p>
<pre>pool &lt;WORD&gt; &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; netmask &lt;A.B.C.D&gt; }</pre>	<p>Define DHCP address pool.</p>

---

#### Command Modes

Perle(config)#ip nat

---

#### Usage Guidelines

Use this command when you want NAT to remap one IP address space into another. NAT modifies the network address information in the IP header of packets while they are in transit across a traffic routing device. NAT allows you to use these private IP address on the internal network. Your private networks can assign a unique IP address to all your computers, servers and other IP driven resources, usually via DHCP.

These are known as private internal networks. When a host on your internal private network needs to communicate outside it's private network, it uses the public IP address on the network's gateway to identify itself to the rest of the world, and this translation of converting a private IP address to public is done by NAT.

---

#### Examples

This example allows all local traffic to the Internet through ethernet port 1. First you need to create an access-list.

```
Perle(config)#ip access-list standard 1
```

```
Perle(config-std-nacl)#permit any
```

```
Perle(config)#ip nat inside source list 1 interface ethernet 1 overload
```

---

#### Related Commands

*show ip nat*

## ip prefix-list

### ip prefix-list



```
{<WORD> deny <A.B.C.D> </n | A.B.C.D> ge | le <1-32> | description <LINE> |
permit <A.B.C.D> </n | A.B.C.D> ge | le <1-32> | seq <1-65535> deny <A.B.C.D>
</n | A.B.C.D> ge | le <1-32> | permit <A.B.C.D> </n | A.B.C.D> ge | le <1-32>}
```

Use the no form of this command to negate or set to defaults.

Syntax Description	ip prefix-list
<pre>{&lt;WORD&gt; deny &lt;A.B.C.D&gt; &lt;/n   A.B.C.D&gt; ge   le &lt;1-32&gt;   description &lt;LINE&gt;   permit &lt;A.B.C.D&gt; &lt;/n   A.B.C.D&gt; ge   le &lt;1-32&gt;   seq &lt;1-65535&gt; deny &lt;A.B.C.D&gt; &lt;/n   A.B.C.D&gt; ge   le &lt;1-32&gt;   permit &lt;A.B.C.D&gt; &lt;/n   A.B.C.D&gt; ge   le &lt;1-32&gt;}</pre>	<p>Configure prefix-list filter.</p> <p><b>ge value</b> (optional) Specifies a prefix length greater than or equal to the value. It is the lowest value of a range of the length (the "from" portion of the length range)</p> <p><b>le value</b> (optional) Specifies a prefix length less than or equal to the value. It is the highest value of a range of the length (the "to" portion of the length range).</p>
Command Modes	Perle(config)#ip prefix-list
Usage Guidelines	<p>Use this command to create prefix lists. Prefix lists are used in route maps and route filtering operations. They can be used as an alternative to access lists in many routing filtering commands. The most important difference is that a prefix-list allows you to filter networks based on their subnet mask.</p>
Examples	<p>This example shows how to accept a mask length of up to 24 bits in routes with the prefix 172.20.10.171/16.</p> <pre>Perle(config)#ip prefix list1 permit 172.20.10.171 /16 le 24</pre> <p>This example shows how to permit the prefix 172.17.0.0/16.</p> <pre>Perle(config)#ip prefix list2 permit 172.17.0.0 255.255.0.0</pre>
Related Commands	<i>show ip access-lists</i>

## ip radius

### ip radius

```
{source-interface [bvi <1-9999>] | [dialer <0-15>] | [dot11radio <0-4>] |
[ethernet <1-2> . <1-4000>] | [openvpn-tunnel <0-999>] | [tunnel <0-999>]}
```

Use the no form of this command to negate or set to defaults.

Syntax Description	ip radius
--------------------	-----------

<pre>{source-interface [bvi &lt;1-9999&gt;]   [dialer &lt;0-15&gt;]   [dot11radio &lt;0-4&gt;]   [ethernet &lt;1-2&gt;, &lt;1-4000&gt;]   [openvpn-tunnel &lt;0-999&gt;]   [tunnel &lt;0-999&gt;]}</pre>	Configure an interface as the source IP address from which the RADIUS client sends RADIUS requests or receives responses.
<b>Command Modes</b>	Perle(config)#ip radius

### Usage Guidelines

Use this command to configure Remote Authentication Dial-In User Service (RADIUS) authentication. RADIUS authenticates local and remote users on a company network. RADIUS is a client/server system that keeps the authentication information for users, remote access servers, VPN gateways, and other resources in one central database.

### Examples

This example configures the source-interface as ethernet 1  
 Perle(config)#ip radius source-interface ethernet 1

### Related Commands

*clear radius*  
*show radius*

## ip route

### ip route

```
{<A.B.C.D> <A.B.C.D> <A.B.C.D> <1-255> | [bvi <1-9999>] | [ethernet <1-2> <1-255> dhcp | vrrp <1-255> | null <1-255>] | [table <1-200> <A.B.C.D> <A.B.C.D> <A.B.C.D>] | [bvi <1-9999>] | [dialer <0-15>] | [dot11radio <0-4>] | [ethernet <1-2> dhcp | vrrp <1-255> | null <1-255>] | [openvpn <0-999>] | [tunnel <0-999> | <1-255> | dhcp]}
```

Use the no form of this command to negate or set to defaults.

Syntax Description	ip route
<pre>&lt;A.B.C.D&gt; &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; &lt;1-255&gt;   [bvi &lt;1-9999&gt;]   [dot11radio &lt;0-4&gt;]   [ethernet &lt;1-2&gt; &lt;1-255&gt; dhcp   vrrp &lt;1-255&gt;   null &lt;1-255&gt;]   [table &lt;1-200&gt; &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;]   [bvi &lt;1-9999&gt;]   [dialer &lt;0-15&gt;]   [ethernet &lt;1-2&gt; dhcp</pre>	<p>Configure static routes.</p> <p>Prefix—specifies the IP route prefix for the destination</p> <p>mask—specifies the prefix mask for the destination</p> <p>ip-address—specifies the IP address of the next hop used to reach that network</p> <p>metric—specifies the metric of the route.</p> <p>interface—apply this route to this interface</p> <p>dhcp—default gateway obtained from DHCP</p>

```
| vrrp <1-255> | null <1-255> |
| [openvpn <0-999>] | [tunnel
<0-999> | <1-255> | dhcp]}
```

**Command Modes**

Perle(config)#ip route

**Usage Guidelines**

Use this command to configure a static route.

**Examples**

This example routes packets from network 172.16.1.7 to a router at 172.17.23.20.

```
Perle(config)#ip route 172.16.1.7 255.255.0.0 172.17.23.20
```

**Related Commands**

[ip route-policy](#)

**ip route-policy****ip route-policy**

```
{route-policy <WORD>}
```

Use the no form of this command to negate or set to defaults.

**Syntax Description****ip route-policy**

```
{route-policy <WORD>}
```

Configure a route policy. See [\(config-pbr-rules\)](#) for more information.

**Command Modes**

Perle(config)#ip route-policy

**Usage Guidelines**

Use this command to create a route policy name.

**Examples**

This example creates route policy testlab.

```
Perle(config)#ip route-policy testlab
```

**Related Commands**

[\(config-pbr-rules\)](#)

**(config-pbr)**

```
{description <LINE>}
```

```
| enable-default-log
```

```
| rule <1-9998>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-pbr)
{description <LINE>		Configure a policy rule.
enable-default-log		Configure default log.
rule <1-9998>}		Configure rule number.
Command Modes		Perle(config-pbr)#

### Usage Guidelines

Use this command to create a policy rule.

### Examples

This example configures rule number 10, then enter sub menu mode.

```
Perle(config-pbr)#rule 10
```

```
Perle(config-pbr-rules)#
```

### (config-pbr-rules)

```
{description <LINE> |
log-enable |
match [destination address <A.B.C.D> <A.B.C.D> | not <A.B.C.D> <A.B.C.D> |
start <A.B.C.D> stop <A.B.C.D>] | [port <1-65535> | not <1-65535> | start <1-
65535> stop <1-65535>] | [fragment | fragment | non-fragment] | [icmp type <0-
255> code <0-255>] | [ipsec ipsec | non-ipsec] | [protocol <0-255> ah | dccp | dsr |
egp | eigrp | encap | esp | esp | etherip | ggp | gre | hmp | icmp | idpr | igmp | igp |
ip | ipip | ipv6 | ipv6-frag | ipc6-icmp | ipv6-nonxt | ipv6-opts | ipv6-route | isis |
l2tp | manet | mpls-in-ip | narp | not | ospf | pim | rdp | rohc | rsvp | sctp | sdrp |
shim6 | skip | tcp | udp | udplite | xns-idp] | [recent count <1-255> | time <1-
4294967295>] | [source address <A.B.C.D> <A.B.C.D> | not <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D> | mac-address <H.H.H> | not <A.B.C.D> | [state
established disable | enable] | [invalid disable | enable] | [new disable | enable] |
related tcp-flags ack | all | fin | psh | rst | syn | urg | not |
set action drop | [dscp af11 | af12 | af13 | af 21 | af22 | af 23 | af31 | af33 | af41 |
af42 | af43 | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef] | mark <1-2147483647> | [routing-
table <1-200> | main] | tcp-mss <500-1460> | pmtu | <500-1460> |
time monthdays <1-31> | not <1-31> | startdate month <WORD> <1-31> <2001-
2037>] | [starttime <hh:mm:ss>] | stopdate month <WORD> <1-31> <2001-2037>
| stoptime <hh:mm:ss> | utc | weekdays <DAY> | not <DAY>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-pbr-rules)
{description <LINE>		Configure policy rule description.
log-enable		Logs packet matching the rule.

---

```

match [destination address
<A.B.C.D> <A.B.C.D> | not
<A.B.C.D> <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D>] |
[port <1-65535> | not <1-65535> |
start <1-65535> stop
<1-65535>] | [fragment |
fragment | non-fragment] |
[icmp type <0-255> code <0-255>] |
[ipsec ipsec | non-ipsec]
| [protocol <0-255> ah | dccp |
dsr | egp | eigrp | encap | esp |
esp | etherip | ggp | gre | hmp |
icmp | idpr | igmp | igp | ip |
ipip | ipv6 | ipv6-frag | ipc6-icmp |
ipv6-nonxt | ipv6-opts |
ipv6-route | isis | l2tp | manet |
mpls-in-ip | narp | not | ospf |
pim | rdp | rohc | rsvp | sctp |
sdrp | shim6 | skip | tcp | udp |
udplite | xns-idp] | [recent
count <1-255> | time <1-4294967295>] |
[source
address <A.B.C.D> <A.B.C.D>
| not <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D> |
mac-address <H.H.H> | not
<A.B.C.D> | [state established
disable | enable] | [invalid
disable | enable] | [new disable
| enable] | related tcp-flags ack
| all | fin | psh | rst | syn | urg |
not |

```

---

Configure match values as define to the routing table.

```

set action drop | [dscp af11 |
af12 | af13 | af21 | af22 | af23 |
af31 | af32 | af33 | af41 | af42 |
af43 cs1 | cws2 | cs3 | cs4 | cs5 |
cs6 | cs7 ef] | mark <1-2147483647> |
[routing-table
<1-200> | main] | tcp-mss
<500-1460> | pmtu | <500-1460>|

```

Sets action for policy rules.

---

**time** **monthdays** <1-31> | **not** <1-31> | **startdate** **month** <WORD> <1-31> <2001-2037> | [**starttime** <hh:mm:ss>] | **stopdate** **month** <WORD> <1-31> <2001-2037> | **stoptime** <hh:mm:ss> | **utc** | **weekdays** <DAY> | **not** <DAY> }

---

Configure the time to match the rules.

---

#### Command Modes

---

Perle(config-pbr-rules)#

---

#### Usage Guidelines

Use these commands to set policy rules.

---

#### Examples

This example sets the action for the packets that match defined rule.

```
Perle(config-pbr-rules)# set action drop
```

This example uses policy-based routing to route all HTTP traffic protocol tcp, destination port 80 through a policy route called http-firewall.

```
Perle(config)# ip route 0.0.0.0 0.0.0.0 10.10.200.9
```

```
Perle(config)# ip route table 2 0.0.0.0 0.0.0.0 172.16.0.8
```

```
Perle(config-pbr)# ip route-policy http-firewall
```

```
Perle(config-pbr)# rule 2
```

```
Perle(config-pbr-rules)# set routing-table 2
```

```
Perle(config-pbr-rules)# match protocol tcp
```

```
Perle(config-pbr-rules)# match destination port 80
```

```
Perle(config)# interface ethernet 1
```

```
Perle(config-if)# ip address 192.168.2.1 255.255.255.0
```

```
Perle(config-if)# ip policy route-policy http-firewall
```

## ip scp

### ip scp

```
{ password 0 <LINE> | 7 <WORD> | <LINE> | username <WORD> }
```

Use the no form of this command to negate or set to defaults.

---

#### Syntax Description

#### ip scp

---

```
{ scp password 0 <LINE> | 7 <WORD> | <LINE> | username <WORD> }
```

---

Configure SCP password and username.

---

#### Command Modes

---

Perle(config)#ip scp

---

**Usage Guidelines**

Use this command to configure the username and password to enable the IOLAN to securely copy files from a remote workstation.

---

**Examples**

This example configures the username for a connection to a remote host.

```
Perle(config)#ip scp username lynlab
```

## ip sftp

### ip sftp

```
{username <WORD> | password <0 <LINE> | 7 <LINE> | <LINE>}
```

Use the no form of this command to negate or set to defaults.

---

**Syntax Description****ip sftp**

---

```
{username <WORD> |  
password <0 <LINE> | 7  
<LINE> | <LINE>}
```

SFTP configuration commands.

---

**Command Modes**

Perle(config)#ip sftp

---

**Usage Guidelines**

Use this command to create a SFTP secure connection to a remote host.

---

**Examples**

This example configures a username fred.

```
Perle(config)#ip sftp username fred
```

## ip ssh

### ip ssh

```
{authentication-retries <0-5> |
```

```
client algorithms mac hmac hmac-sha1 | hmac-sha1-etm@openssh.com | hmac-  
sha2-256 | hmac-sha2-256-etm@openssh.com | hmac-sha2-512 | hmac-sha2-512 -  
etm@openssh.com | umac-128-etm@openssh.com | umac-128@openssh.com |  
64-etm@openssh.com | umac-64@openssh.com |
```

```
pubkey-chain |
```

```
server algorithm encryption 3des-cbc | aes128-cbc | aes128-ctr | aes128-  
gcm@openssh.com | aes192-cbc | aes192-ctr | aes256-cbc | aes256-ctr | aes256-  
gcm@openssh.com | arcfour | arcfour128 | arcfour256 | blowfish-cbc | cast128-  
cbc | chacha2--poly1305@openssh.com | rijndael-cbc@lysator.liu.se | mac hmac-  
md5 | hmac-md5-96 | hmac-md5-96-etm@openssh.com | hmac-md5-  
etm@openssh.com | hmac-ripemd160 | hmac-ripemd160-etm@openssh.com |  
hmac-sha1 | hmac-sha2-256 | hmac-sha2-256-etm@openssh.com |hmac-sha2-512
```

| **hmac2-512-etm@openssh.com** | **umac-128-etm@openssh.com** | **umac-128@openssh.com** | **umac-64-etm@openssh.com** | **umac-64@openssh.com** | **stricthostkeycheck** | **time-out** <120>}  
 Use the no form of this command to negate or set to defaults.

Syntax Description	ip ssh
{ <b>authentication-retries</b> <0-5>	Configure ssh authentication retries. Values are 1 to 5 Default is 3
<b>client algorithms mac hmac hmac-sha1-etm@openssh.com   hmac-sha2-256-etm@openssh.com   hmac-sha2-512-etm@openssh.com   umac-128-etm@openssh.com   umac-128@openssh.com   64-etm@openssh.com   umac-64@openssh.com</b>	Configure the SSH client parameters.
<b>pubkey-chain</b>	Configure to use a public key-chain.
<b>server algorithm encryption 3des-cbc   aes128-cbc   aes128-ctr   aes128-gcm@openssh.com   aes192-cbc   aes192-ctr   aes256-cbc   aes256-ctr   aes256-gcm@openssh.com   arcfour   arcfour128   arcfour256   blowfish-cbc   cast128-cbc   chacha20-poly1305@openssh.com   rijndael-cbc@lysator.liu.se   mac hmac-md5   hmac-md5-96-etm@openssh.com   hmac-md5-etm@openssh.com   hmac-ripemd160   hmac-ripemd160-etm@openssh.com   hmac-sha1   hmac-sha2-256   hmac-sha2-256-etm@openssh.com   hmac-sha2-512   hmac2-512-</b>	



---

<b>etm@openssh.com   umac-128-etm@openssh.com   umac-128@openssh.com   umac-64-etm@openssh.com   umac-64@openssh.com  </b>	Configure the SSH server parameters.
--	--------------------------------------

---

<b>stricthostkeycheck  </b>	Enables SSH server authentication.
-----------------------------	------------------------------------

---

<b>time-out &lt;120&gt;</b>	Configure SSH login time out interval. Values are 1 to 120 seconds. Default is 20 seconds
-----------------------------	---

---

<b>Command Modes</b>	Perle(config)#ip ssh
----------------------	----------------------

---

### Usage Guidelines

The SSH protocol enables you to set up SSH connections. Your IOLAN supports both client and server modes.

### Examples

This example sets server mode for encryption hmac-md5.  
Perle(config)#ip ssh server algorithm mac hmac-md5

---

### Related Commands

*telnet*  
*ip ssh*  
*show ssh*

## ip tacacs

### ip tacacs

**{tacacs source-interface bvi <1-9999> | | dialer <0-15> | dot11radio<0-4> | ethernet <1-2> . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999>}**

Use the no form of this command to negate or set to defaults.

---

### Syntax Description

### ip tacacs

<b>{tacacs source-interface bvi &lt;0-9999&gt;     dialer &lt;0-15&gt;   dot11radio&lt;0-4&gt;   ethernet &lt;1-2&gt; . &lt;1-4000&gt;   openvpn-tunnel &lt;0-999&gt;   tunnel &lt;0-999&gt;}</b>	Configure the source interface for TACACS+ requests.
---	--

---

<b>Command Modes</b>	Perle(config)#ip tacacs
----------------------	-------------------------

---

### Usage Guidelines

Use this command to configure for Terminal Access Controller Access Control System (TACACS+) authentication.

---

**Examples**

This example configures the source-interface as ethernet 1  
 Perle(config)#ip tacacs source-interface ethernet 1

---

**Related Commands**

*clear tacacs*  
*tacacs*

**ip telnet****ip telnet**

{**server**}

Use the no form of this command to negate or set to defaults.

---

**Syntax Description****ip telnet**

{**server**}

Enables Telnet server.

---

**Command Modes**

Perle(config)#ip telnet

---

**Usage Guidelines**

Use this command to config Telnet as the protocol to use for connections to a host. Telnet allows a user at one site to establish a TCP connection to a login server at another site and then pass the keystrokes from one device to the other.

---

**Examples**

This example enables telnet server.  
 Perle(config)#ip telnet server

---

**Related Commands**

*telnet*  
*show management-access*  
*(management-access-LAN)*  
*(management-access-WAN)*

**ipv6****ipv6**

{**access-list** <WORD> |  
**dhcp pool** <WORD> |  
**dns domain** <WORD> **server** <X:X:X:X::X> | **listen-address** <X:X:X:X::X> |  
**firewall** <WORD> | **ipv6-receive-redirects enable** | **ipv6-src-route enable** | **state-policy** [established action accept | drop | reject] | [invalid action accept | drop | reject] | [related accept | drop | reject] |  
**host** <WORD> | <X:X:X:X::X> |  
**name-server** <X:X:X:X::X> |  
**prefix-list** <WORD> |

```

radius source-interface bvi <1-9999> | dialer <0-15> dot11radio <0-4> || ethernet
<1-2> . <1-4000> openvpn-tunnel <0-999> tunnel <0-999> |
route <A.B.C.D> <A.B.C.D> | bvi <1-9999> dot11radio <0-4> | dialer <0-15>
dot11radio <0-4> | ethernet <1-2> . <1-4000> | open-vpn-tunnel <0-999> | tunnel
<0-999> <X:X:x:X::X <1-255> | table <1-200> X:X:X:X::X/<0-128> bvi <1-
9999> | dialer <0-15> dot11radio <0-4> | ethernet <1-2> . <1-4000> | null | open-
vpn-tunnel <0-999> | tunnel <0-999> <X:X:x:X::X <1-255> |
route-policy <WORD> |
router ospf | rip |
tacacs source-interface bvi <1-9999> | dialer <0-15> | ethernet <1-2> . <1-4000>
openvpn-tunnel <0-999> tunnel <0-999> |
unicast-routing}

```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	ipv6
{access-list <WORD>	Configure access list name.
dhcp pool <WORD>	Configure the dhcp pool name.
dns domain <WORD> server <X:X:X:X::X>   listen-address <X:X:X:X::X>	Configure DNS domain parameters.
firewall <WORD>   ipv6-receive-redirects enable   ipv6-src-route enable   state-policy [established action accept   drop   reject]   [invalid action accept   drop   reject]   [related accept   drop   reject]	Configure firewall options.
host <WORD>   <X:X:X:X::X>	Configure static host names.
name-server <X:X:X:X::X>	Configure the address of the name server.
prefix-list <WORD>	Configure a prefix-list filter.
radius source-interface bvi <1-9999>     dot11radio <0-4>   dialer <0-15>   ethernet <1-2> . <1-4000> openvpn-tunnel <0-999> tunnel <0-999>	Configure RADIUS configuration parameters.

<b>route</b> <A.B.C.D> <A.B.C.D>   <b>bvi</b> <1-9999>   <b>dialer</b> <0-15> <b>dot11radio</b> <0-4>   <b>ethernet</b> <1-2>. <1-4000>   <b>open-vpn-tunnel</b> <0-999>   <b>tunnel</b> <0-999> <X:X:x:X::X <1-255>   <b>table</b> <1-200>	Configure static routes.
<b>route-policy</b> <WORD>	Configure IPv6 route policy name.
<b>router ospf</b>   <b>rip</b>	Enable IPv6 routing process.
<b>tacacs source-interface bvi</b> <1-9999>     <b>dot11radio</b> <0-4>   <b>dialer</b> <0-15>   <b>ethernet</b> <1-2> . <1-4000> <b>openvpn-tunnel</b> <0-999> <b>tunnel</b> <0-999>	Configure TACACS+ configuration parameters.
<b>unicast-routing</b> }	Enables unicast routing.

<b>Command Modes</b>	Perle(config)#ipv6
----------------------	--------------------

### Usage Guidelines

Use this command to configure IPv6 parameters.

### Examples

This example configures the DHCP pool name.

```
Perle(config)#ipv6 dhcp pool ipv6pool1
```

### Related Commands

*show ipv6*

### (config-ipv6-acl)

```
{<1-65535> |  
deny | <X:X:X:X::X/0-128 |any> |  
permit <X:X:X:X::X/0-128 | any>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-ipv6-acl)
{<1-65535>	Configure the sequence number.
<b>deny</b> <X:X:X:X::X/0-128   <b>any&gt; exact-match</b>	Configure to deny specified packets.
<b>permit</b> <X:X:X:X::X/0-128   <b>any&gt; exact-match</b> }	Configure to permit specified packets.

**Command Modes**

Perle(config-ipv6-acl)#

**Usage Guidelines**

Use this command to configure network packets to deny or permit using Access Control Lists (ACLs).

**Examples**

This example denies packets from this network.

```
Perle(config-ipv6-acl)# deny 172.16.0.0/16 exact-match
```

**Related Commands**

*show ipv6*

**(config-dhcpv6)**

```
{address prefix <X:X:X:X::X/0-128> |
dns-server <X:X:X:X::X> |
domain-name <WORD> |
host <WORD> |
lifetime default <0-4294967294> maximum <0-4294967294> minimum <0-4294967294> |
nis address <X:X:X:X::X> | domain-name <WORD> |
nisp address <X:X:X:X::X> | domain-name <WORD> |
sip address <X:X:X:X::X> | domain-name <WORD> |
sntp address <X:X:X:X::X> |
subnet <X:X:X:X::X/<1-128>}

```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-dhcpv6)**

<b>address prefix</b> <X:X:X:X::X/0-128>	Configure the IPv6 address prefix.
<b>dns-server</b> <X:X:X:X::X>	Configure a DNS server for use by clients using this DHCP pool. A DNS server needs to be specified if you want to browse the Internet.
<b>domain-name</b> <WORD>	Configure a domain name.
<b>host</b> <WORD>	Configure the host name.

<b>lifetime default</b> <0-4294967294> <b>maximum</b> <0-4294967294> <b>minimum</b> <0-4294967294>	Configure IPv6 DHCP parameters. Value is 0 to 4294967294 Max value is 0 to 4294967294 Min value is 0 to 4294967294
<b>nis address</b> <X:X:X:X::X>   <b>domain-name</b> <WORD>	Configure the address and domain name of your nis server.
<b>nisp address</b> <X:X:X:X::X>   <b>domain-name</b> <WORD>	Configure the address and domain name of your nisp server.
<b>sip address</b> <X:X:X:X::X>   <b>domain-name</b> <WORD>	Configure the address and domain name of your sip server.
<b>sntp address</b> <X:X:X:X::X>	Configure the address of your SNTP server.
<b>subnet</b> <X:X:X:X::X/<1-128>>}	Configure the subnet.
<b>Command Modes</b>	Perle(config)#

### Usage Guidelines

Use this command to configure IPv6 DHCP parameters.

### Examples

This example sets the dns-server address to 1:2:3:4:5::6.  
Perle(dhcpv6-config)#dns-server 1:2:3:4:5::6

### Related Commands

*show ipv6*

### (config-fw6)

```
{default-action accept | drop | reject |
description <LINE> |
enable-default-logfile |
rule <1-9999>}
```

Use the no form of this command to negate a command or set to defaults.

### Syntax Description (config-fw6)

{default-action accept   drop   reject	Configure default action for firewall rules.
description <LINE>	Configure firewall rules description.
enable-default-logfile	Logs packets matching default action.

---

**rule** <1-9999>} Creates rule number, then goes into sub menu mode.

---

**Command Modes** Perle(config-fw6)#

---

### Usage Guidelines

Use this command to configure IPv6 firewall options.

---

### Examples

This example sets the default action for firewall rules.

```
Perle(config-fw6)# default-action drop
```

---

### Related Commands

*show ipv6*

### (config-fw6-rules)

```
{description <WORD> |
disable |
log-enable |
match destination [address <X:X:X::X/0-128> | not <X:X:X::X/0-128> | start
<X:X:X::X> stop <X:X:X::X>] | port <1-65535> not <X:X:X::X/0-128> | start
<X:X:X::X> stop <X:X:X::X>] | [fragment fragment | non-fragment] | icmp type
<0-255> code <0-255> | typenane address-unreachable | bad-header |
communication-prohibited | destination-unreachable | echo-reply | echo-request
| neighbour-advertisement | neighbour-solicitation | no-route | packet-too-big |
parameter-problem | port-unreachable | route-advertisement | router-
solicitation | time-exceeded | ttl-zero-during-reassembly | ttl-zero-during-transit |
unknown-header-type | unknown-option] | ipsec ipsec | non-ipsec | [protocol <0-
255> | ah | dccp | dsr | egp | eigrp | encap | esp | etherip | ggp | gre | hmp | icmp |
idpr | igmp | igp | p | ipip | ipv6 | ipv6-frag | ipv6-icmp | ipv6-nonxt | ipv6-opts |
ipv6-route | isis | l2tp | manet | mpls-in-ip | narp | not | ospf | pim | rdp | roho | rvsp
| sctp | sdrp | shim6 | skip | tcp | udp | udplite | vrrp | xnc-idp] | [recent count <1-
255> | time <1-4294967295>] | source address <X:X:X::X/0-128> | not
<X:X:X::X/0-128> | start <X:X:X::X> stop <X:X:X::X>] | [mac-address <H.H.H>
not <H.H.H>] | [port <1-65535> | not <1-65535> | start <1-65535> | stop <1-
65535>] | state [established | disable | enable] | [invalid | disable | enable] | [new
enable | disable] | [related | disable | enable] | tcp-flags ack | all | fin | psh | rst | syn
| urg | not ack | all | fin | psh | rst | syn | urg] |
set action drop | accept | reject |
time monthdays <1-31> | not <1-31>] | startdate <MONTH> <1-31> <2001-
2037> | stopdate <MONTH> <1-31> <2001-2037> | starttime <hh:mm:ss> |
stoptime <hh:mm:ss> | utc | weekdays <DAY> | not <DAY>}]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
	<b>(config-fw6-rules)</b>
{ <b>description</b> <i>&lt;WORD&gt;</i>	Configure a description for the policy rule.
<b>disable</b>	Disables the policy rule.
<b>log-enable</b>	Logs packet matching the rule.
<b>match destination</b> [ <b>address</b> <i>&lt;X:X:X::X/0-128&gt;</i>   <b>not</b> <i>&lt;X:X:X::X/0-128&gt;</i>   <b>start</b> <i>&lt;X:X:X::X&gt;</i>   <b>stop</b> <i>&lt;X:X:X::X&gt;</i>   <b>port</b> <i>&lt;1-65535&gt;</i>   <b>not</b> <i>&lt;X:X:X::X/0-128&gt;</i>   <b>start</b> <i>&lt;X:X:X::X&gt;</i>   <b>stop</b> <i>&lt;X:X:X::X&gt;</i>   [ <b>fragment</b> <b>fragment</b>   <b>non-fragment</b> ]   <b>icmp type</b> <i>&lt;0-255&gt;</i>   <b>code</b> <i>&lt;0-255&gt;</i>   <b>typenane</b> <b>address-unreachable</b>   <b>bad-header</b>   <b>communication-prohibited</b>   <b>destination-unreachable</b>   <b>echo-reply</b>   <b>echo-request</b>   <b>neighbour-advertisement</b>   <b>neighbour-solicitation</b>   <b>no-route</b>   <b>packet-too-big</b>   <b>parameter-problem</b>   <b>port-unreachable</b>   <b>route-advertisement</b>   <b>router-solicitation</b>   <b>time-exceeded</b>   <b>ttl-zero-during-reassembly</b>   <b>ttl-zero-during-transit</b>   <b>unknown-header-type</b>   <b>unknown-option</b> ]   <b>ipsec ipsec</b>   <b>non-ipsec</b>   [ <b>protocol</b> <i>&lt;0-255&gt;</i>   <b>ah</b>   <b>dccp</b>   <b>dssr</b>   <b>egp</b>   <b>eigrp</b>   <b>encap</b>   <b>esp</b>   <b>etherip</b>   <b>ggp</b>   <b>gre</b>   <b>hmp</b>   <b>icmp</b>   <b>idpr</b>   <b>igmp</b>   <b>igp</b>   <b>p</b>   <b>ipip</b>   <b>ipv6</b>   <b>ipv6-frag</b>   <b>ipv6-icmp</b>   <b>ipv6-nonxt</b>   <b>ipv6-opts</b>   <b>ipv6-route</b>   <b>isis</b>   <b>l2tp</b>   <b>manet</b>   <b>mpls-in-ip</b>   <b>narp</b>   <b>not</b>   <b>ospf</b>   <b>pim</b>   <b>rdp</b>   <b>roho</b>   <b>rvsp</b>   <b>sctp</b>   <b>sdrp</b>   <b>shim6</b>   <b>skip</b>   <b>tcp</b>   <b>udp</b>   <b>udplite</b>   <b>vrrp</b>   <b>xnc-idp</b> ] <b>recent count</b> <i>&lt;1-255&gt;</i>   <b>time</b> <i>&lt;1-4294967295&gt;</i> ]   <b>source address</b> <i>&lt;X:X:X::X/0-128&gt;</i>   <b>not</b> <i>&lt;X:X:X::X/0-128&gt;</i>   <b>start</b>	Configure match values as define to the routing table.



---

```

<X:X:X:X> stop <X:X:X:X> |
| [mac-address <H.H.H> not
<H.H.H>] | [port <1-65535> |
not <1-65535> | start <1-
65535> | stop <1-65535>] |
state [established disable |
enable] | [invalid disable |
enable] | [new enable | disable]
| [related disable | enable] |
tcp-flags ack | all | fin | psh |
rst | syn | urg | not ack | all | fin
| psh | rst | syn | urg |

```

Configure match values as define to the routing table.

---

```

set action drop | accept | reject
|

```

Configure packet modifications.

---

```

time monthdays <1-31> | not
<1-31> | startdate <MONTH>
<1-31> <2001-2037> | stopdate
<MONTH> <1-31> <2001-
2037> | starttime <hh:mm:ss>
| stoptime <hh:mm:ss> | utc |
weekdays <DAY> | not
<DAY> | }

```

Configure time parameters.

---

### Command Modes

Perle(config-fw6-rules)#

---

### Usage Guidelines

Use this command to configure firewall rules for IPv6.

---

### Examples

This example sets the action for matched packets.  
Perle(config-fw6-rules)# set action accept

---

### Related Commands

*show ipv6*

### (config-pbr6)

```

{description <LINE> |
enable-default-logfile |
rule <1-9998>}

```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

(config-pbr6)

```

description <LINE> |

```

Configure firewall rules description.

<b>enable-default-logfile</b>	Logs packets matching default action.
<b>rule</b> <1-9998>}	Creates rule number, then goes into sub menu mode.
<b>Command Modes</b>	Perle(config-pbr6)#

### Usage Guidelines

Use this command to configure IPv6 firewall options.

### Examples

This example sets the default action for firewall rules.

```
Perle(config-fw6)# default-action drop
```

### Related Commands

*show ipv6*

### (config-pbr6-rules)#

```
{description <LINE> |
log-enable |
```

```
match [destination address <A.B.C.D> <A.B.C.D> | not <A.B.C.D> <A.B.C.D> |
start <A.B.C.D> stop <A.B.C.D>] | [port <1-65535> | not <1-65535> | start <1-
65535> stop<1-65535>] | [fragment | fragment | non-fragment] | [icmp type <0-
255> code <0-255>] | [ipsec ipsec | non-ipsec] | [protocol <0-255> ah | deep | dsr |
egp | eigrp | encap | esp | esp | etherip | ggp | gre | hmp | icmp | idpr | igmp | igp |
ip | ipip | ipv6 | ipv6-frag | ipc6-icmp | ipv6-nonxt | ipv6-opts | ipv6-route | isis |
l2tp | manet | mpls-in-ip | narp | not | ospf | pim | rdp | rohc | rsvp | setp | sdrp |
shim6 | skip | tcp | udp | udplite | vrrp | xns-idp] | [recent count <1-255> | time
<1-4294967295>] | [source address <A.B.C.D> <A.B.C.D> | not <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D> | mac-address <H.H.H> | not <A.B.C.D> | [state
established disable | enable] | [invalid disable | enable] | [new disable | enable] |
related tcp-flags ack | all | fin | psh | rst | syn | urg | not |
set action drop | [dscp af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 |
af41 | af42 | af43 | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 ef] | mark <1-2147483647> |
[routing-table <1-200> | main] | tcp-mss <500-1460> | pmtu | <500-1460> |
time monthdays <1-31> | not <1-31> | startdate month <WORD> <1-31> <2001-
2037> | [starttime <hh:mm:ss>] | stopdate month <WORD> <1-31> <2001-2037>
| stoptime <hh:mm:ss> | utc | weekdays <DAY> | not <DAY>}
Use the no form of this command to negate a command or set to defaults.
```

### Syntax Description

### (config-pbr6-rules)#

{ <b>description</b> <LINE>	Configure policy rule description.
<b>log-enable</b>	Logs packet matching the rule.

---

```

match [destination address
<A.B.C.D> <A.B.C.D> | not
<A.B.C.D> <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D>] |
[port <1-65535> | not <1-65535> |
start <1-65535> | stop <1-65535>] |
[fragment | fragment | non-fragment] |

```

Configure match values as define to the routing table.

---

```

[icmp type <0-255> code <0-255>] |
[ipsec ipsec | non-ipsec] |
[protocol <0-255> ah | dccp |
dsr | egp | eigrp | encap | esp |
esp | etherip | ggp | gre | hmp |
icmp | idpr | igmp | igp | ip |
ipip | ipv6 | ipv6-frag | ipc6-icmp |
ipv6-nonxt | ipv6-opts |
ipv6-route | isis | l2tp | manet |
mpls-in-ip | narp | not | ospf |
pim | rdp | rohc | rsvp | setp |
sdrp | shim6 | skip | tcp | udp |
udplite | vrrp | xns-idp] |
[recent count <1-255> | time
<1-4294967295>] |
[source address <A.B.C.D> <A.B.C.D> |
not <A.B.C.D> | start
<A.B.C.D> stop <A.B.C.D> |
mac-address <H.H.H> | not
<A.B.C.D> |
[state established
disable | enable] |
[invalid
disable | enable] |
[new
disable | enable] |
[related tcp-flags
ack | all | fin | psh | rst | syn | urg |
not |

```

---

```

set action drop | [dscp af11 |
af12 | af13 | af21 | af22 | af23 |
af31 | af32 | af33 | af41 | af42 |
af43 cs1 | cws2 | cs3 | cs4 | cs5 |
cs6 | cs7 ef] | mark <1-2147483647> |
[routing-table
<1-200> | main] | tcp-mss
<500-1460> pmtu | <500-1460> |

```

Sets action for policy rules.

---

**time** **monthdays** <1-31> | **not** <1-31> | **startdate** **month** <WORD> <1-31> <2001-2037> | [**starttime** <hh:mm:ss>] | **stopdate** **month**<WORD> <1-31> <2001-2037> | **stoptime** <hh:mm:ss> | **utc** | **weekdays** <DAY> | **not** <DAY>}

---

Configure the time to match the rules.

---

#### Command Modes

---

Perle(config-pbr-rules)#

---

#### Usage Guidelines

Use this command to set IPv6 routing rules.

---

#### Examples

This example sets rule to match icmp type 80 code 80.

Perle(config-prb-rules)#match icmp type 80 code 80.

---

#### Related Commands

*show ipv6*

## key

### key

{**chain** <WORD>}

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

#### key

{**chain** <WORD>}

Configure keychain management.

---

#### Command Modes

---

Perle(config)#key

---

#### Usage Guidelines

Use this command to create a key chain. Key chain management allows you to create and maintain key chains, which are sequences of keys (sometimes called shared secrets). You can use key chains with features that secure communications with other devices by using key-based authentication.

---

#### Examples

This example create key chain 1, then go into sub menu key.

Perle(config)#key chain key1

**Related Commands***(config-keychain-key)***(config-key)****{key <1-2147483647>}**

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-key)****{key <1-2147483647>}**

Configure a number for this key.

**Command Modes**

Perle#(config-key)#

**Usage Guidelines**

Use this command in conjunction with (config-keychain-key) to set a key number.

**Examples**

Configures a key number.

Perle(config-key)# key 250

**Related Commands***(config-pbr6-rules)#**(config-keychain-key)***(config-keychain-key)****{string 0 <WORD> | 7 <WORD> | <WORD>}**

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-keychain-key)****{string 0 <WORD> | 7 <WORD> | <WORD>}**

Configure the key chain.

0—specifies an unencrypted password

7—specifies a hidden password with follow

WORD—the unencrypted (cleartext) user password.

**Command Modes**

Perle(config-keychain-key)

**Usage Guidelines**

Use this command to configure a password for key chain.

---

**Examples**

Configure a password for key chain.  
 Perle(config-keychain-key)# string password123

---

**Related Commands**

*(config-pbr6-rules)#*

**ldap****ldap**

{**server** <WORD>}

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****ldap**

{**server** <WORD>}

Configure LDAP server name.

---

**Command Modes**

Perle(config)#ldap

---

**Usage Guidelines**

Use this command configure an LDAP server.

---

**Examples**

This example configures a LDAP server name.  
 Perle(config)# ldap server testldap

---

**Related Commands**

*(config-ldap-server)*

*clear ldap*

*show ldap*

**(config-ldap-server)**

{**base-dn** <WORD> |

**bind authenticate root-dn** <WORD> **password 0** <WORD> | **7** <WORD> | <WORD> |

**ipv4** <WORD> | <A.B.C.D> |

**ipv6** <WORD> | <X:X:X:X::X:X> |

**mode server** |

**search-filter** <WORD> |

**secure cipher** | **transport port** <1-65535> | **trustpoint** <WORD> |

**timeout retransmission** <1-65535>

**transport port** <1-65535> |

**user-attribute other** <WORD> | **samaccountname** | **uid**}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-ldap-server)
<b>{base-dn &lt;WORD&gt;  </b>	Configure the Base DN for LDAP. The Base DN is the starting point an LDAP server uses when searching for user authentication within your Directory.
<b>bind authenticate root-dn</b> <b>&lt;WORD&gt; password 0</b> <b>&lt;WORD&gt;   7&lt;WORD&gt;  </b> <b>&lt;WORD&gt;  </b>	Configure <ul style="list-style-type: none"> <li>• An authenticated bind is performed when a root distinguished name (DN) and password are available</li> <li>• In the absence of a root DN and password, an anonymous bind is performed</li> </ul>
<b>ipv4 &lt;WORD&gt;   &lt;A.B.C.D&gt;  </b>	Configure the IPv4 address of LDAP server.
<b>ipv6 &lt;WORD&gt;  </b> <b>&lt;X:X:X:X::X:X&gt;  </b>	Configure the IPv6 address of LDAP server.
<b>mode secure  </b>	Set the server mode. <ul style="list-style-type: none"> <li>• secure – configures the LDAP to initiate the transport layer security (TLS) connection and specifies the secure mode</li> <li>• non-secure</li> </ul> Default is non-secure
<b>search-filter &lt;WORD&gt;  </b>	Configure a search filter The search filter operation must be supported on the LDAP server. Filters are to restrict the numbers of users or groups that are permitted to access an application. In essence, the filter limits what part of the LDAP tree the application syncs from.  A filter can and should be written for both user and group membership. This ensures that you are not flooding your application with users and groups that do not need access.
<b>secure cipher   transport port</b> <b>&lt;1-65535&gt;   trustpoint</b> <b>&lt;WORD&gt;  </b>	Configure <ul style="list-style-type: none"> <li>• ciphers—adh, dh, dss, edh, high, medium, rsa, sslv3</li> <li>• transport—listening port for secure connections</li> <li>• trustpoint</li> </ul> Default listening port for secure transfer connections is 636

---

<b>timeout retransmission</b> <1-65535>	Configure the timeout for retransmissions. Values are 1 to 65535 Default is 30 seconds
---	--

---

<b>transport port</b> <1-65535>	Configure the listening port for unsecured connections. Default port is 389
---------------------------------	--

---

<b>user-attribute other</b> <WORD>   <b>samaccountname</b>   <b>uid</b> }	Configure the user attribute. <ul style="list-style-type: none"> <li>• other—configure custom user attribute</li> <li>• sAMAccountName— Microsoft Active Directory</li> <li>• uid—OpenLDAP</li> </ul>
--	---

---

<b>Command Modes</b>	Perle(config-ldap-server)#
----------------------	----------------------------

---

### Usage Guidelines

Use this command to configure LDAP server parameters.

---

### Examples

#### Search filter for LDAP

For example, if your users are distinguished by having two objectClass attributes (one equal to 'person' and another to 'user'), this is the command to match for it.  
Perle(config-ldap-server) #search-filter (&(objectClass=person)(objectClass=user))

#### Search filter for Microsoft Active Directory

This only synchronize users in the 'Warehouse' group—this should be applied to the User Object Filter:

```
Perle(config-ldap-server) #search-filter
(&(objectCategory=Person)(sAMAccountName=*)(memberOf=cn=CaptainPlanet,o
u=users,dc=company,dc=com))
```

---

### Related Commands

*aaa*  
*show ldap*  
*clear ldap*  
*ldap*  
*(config-sg-ldap)*

## line

```
line
{console <0-0 > |
<1-48> |
vty <0-15>}
```

Use the no form of this command to negate a command or set to defaults.

---

<b>Syntax Description</b>	<b>line</b>
---------------------------	-------------



<code>{console &lt;0-0&gt;  </code>	Primary terminal line. See <a href="#">(config-line)#console</a>
<code>&lt;1-48&gt;  </code>	Terminal/serial. See <a href="#">(config-line)#tty</a>
<code>vtty &lt;0-15&gt;}</code>	Virtual terminal. See <a href="#">(config-line)#vtty</a>
<b>Command Modes</b>	Perle(config)#line

### Usage Guidelines

Use this command to change to line mode configuration.

### Examples

Go into line configuration mode for tty 2.  
Perle(config)# tty 2

### Related Commands

[\(config-line\)#console](#)  
[\(config-line\)#tty](#)  
[\(config-line\)#vtty](#)

## Ildp

### Ildp

```
{hold-mult <2-10> |
logging |
notification-interval |
optional-tlv port-info |
reinit <1-10> |
run |
timer |
tv1-select mac-phy-cfg| managemnt-address <A.B.C.D> | <X:X:X:X:X>| max-
frame-size | port-description | system capabilities | system description | system-
name |
tx-delay}
```

### Syntax Description

### Ildp

<code>{hold-mult &lt;2-10&gt;  </code>	Configure a value for the LLDP hold multiplier. This is the time to cache learned LLDP information before discarding, measured in multiples of the timer parameter.
--	---

	<p>For example, if the Timer is 30 seconds, and the Hold Multiplier is 4, then the LLDP packets are discarded after 120 seconds.</p> <p>Default is 4 Values are 2 to 10</p>
<b>logging</b>	<p>Configure logging for LLDP neighbor discovery.</p> <p>Default is off.</p>
<b>notification-interval</b>	<p>Configure the minimum interval between LLDP SNMP notifications.</p> <p>Default is 5 seconds Value is 5 to 3600 seconds</p>
<b>optional-tlv port-info</b>	<p>Reverts to the previous setting of providing the interface name.</p>
<b>reinit</b> <1-10>	<p>Configure the delay (in sec) for LLDP initializations on any interface.</p> <p>Default is 2 seconds Values are 1 to 10 seconds</p>
<b>run</b>	<p>Enables LLDP. LLDP Disabled by default.</p>
<b>timer</b>	<p>Configure the rate at which LLDP packets are sent.</p> <p>This parameter is used with the TX Hold multiplier parameter to determine when LLDP packets are discarded.</p> <p>Default is 30 seconds Values are 5 to 32768 seconds</p>
<b>tlv-select mac-phy-cfg   managemnt-address &lt;A.B.C.D&gt;   &lt;X:X:X:X:X&gt;   max-frame-size   port- description   system capabilities   system description   system-name  </b>	<p>Configure the LLDP TLVs to send. Default is all TLVs are sent.</p> <p>Maximum management addresses are 8. Default management addressees are automatically selected by LLDP.</p>
<b>tx-delay</b> }	<p>Configure the amount of time in seconds that passes between successive LLDP frame transmissions due to changes in the LLDP local systems MIB.</p> <p>Default is 30 seconds Values are 1 to 8192 seconds</p>
<b>Command Modes</b>	Perle(config)#lldp

---

### Usage Guidelines

Use this command to configure Link Layer Discovery Protocol (LLDP) parameters. LLDP allows network devices to advertise their identity and capabilities on a LAN. LLDP specifically defines a standard method for Ethernet network devices such as switches, routers, and wireless LAN access points to advertise information about themselves to other nodes on the network and store the information they discover. LLDP should be enabled in a multi-vendor network.

---

### Examples

This example enables LLDP.  
 Perle(config)#lldp run

---

### Related Commands

*clear lldp*  
*show lldp*

## logging

### logging

```
{<hostname> | <A.B.C.D> |
alarm <2-3> | major | minor |
buffered <0-7> | <4096-32768> | alert | critical | debugging | emergencies |
errors | informational | notifications | warnings |
console <0-7> | <4096-32768> | alert | critical | debugging | emergencies | errors |
informational | notifications | warnings |
delimiter tcp |
facility auth | cron | daemon | kern | local0 | local1 | local2 | local3 | local4 | local5
| local6 | local7 | lpr | mail | news | sys10 | sys11 | sys12 | sys13 | sys14 | sys9 |
syslog | user | ucp |
file flash: <filename> <0-7> | <4096-32768> | alert | critical | debugging |
emergencies | errors | informational | notifications | warnings |
host <A.B.C.D> transport tcp port <1-65535> | udp port <1-65535> |
monitor <0-7> | <4096-32768> | alert | critical | debugging | emergencies | errors
| informational | notifications | warnings |
on |
origin-id hostname | ip | ipv6 | string |
rate-limit <1-10000> except <0-7> | <4096-32768> | alert | critical | debugging |
emergencies | errors | informational | notifications | warnings |
source interface bvi <1-9999> | dot11radio <0-4> | ethernet <1-2> | openvpn-
tunnel <0-999> | tunnel <0-999> |
trap <0-7> | <4096-32768> | alert | critical | debugging | emergencies | errors |
informational | notifications | warnings }
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	logging
{<hostname>   <A.B.C.D>	Configure the address of the logging host.
<b>alarm</b> <2-3>   <b>major</b>   <b>minor</b>	Sets the severity alarm level. <b>major</b> —immediate action needed (severity 2) <b>minor</b> —minor warning conditions (severity 3)
<b>buffered</b> <0-7>   <4096-32768>   <b>alert</b>   <b>critical</b>   <b>debugging</b>   <b>emergencies</b>   <b>errors</b>   <b>informational</b>   <b>notifications</b>   <b>warnings</b>	Configure buffered logging parameters.
<b>console</b> <0-7>   <4096-32768>   <b>alert</b>   <b>critical</b>   <b>debugging</b>   <b>emergencies</b>   <b>errors</b>   <b>informational</b>   <b>notifications</b>   <b>warnings</b>	Configure console logging parameters.
<b>delimiter tcp</b>	Appends delimiter to syslog messages.
<b>facility</b> <b>auth</b>   <b>cron</b>   <b>daemon</b>   <b>kern</b>   <b>local0</b>   <b>local1</b>   <b>local2</b>   <b>local3</b>   <b>local4</b>   <b>local5</b>   <b>local6</b>   <b>local7</b>   <b>lpr</b>   <b>mail</b>   <b>news</b>   <b>sys10</b>   <b>sys11</b>   <b>sys12</b>   <b>sys13</b>   <b>sys14</b>   <b>sys9</b>   <b>syslog</b>   <b>user</b>   <b>ucp</b>	Configure facility parameter for syslog messages.
<b>file flash:</b> <filename> <0-7>   <4096-32768>   <b>alert</b>   <b>critical</b>   <b>debugging</b>   <b>emergencies</b>   <b>errors</b>   <b>informational</b>   <b>notifications</b>   <b>warnings</b>	Configure file logging parameters.
<b>host</b> <A.B.C.D> <b>transport tcp</b> <b>port</b> <1-65535>   <b>udp port</b> <1-65535>	Configure the syslog server IP address and parameters.
<b>monitor</b> <0-7>   <4096-32768>   <b>alert</b>   <b>critical</b>   <b>debugging</b>   <b>emergencies</b>   <b>errors</b>   <b>informational</b>   <b>notifications</b>   <b>warnings</b>	Configure terminal line (monitor) logging parameters.
<b>on</b>	Enables logging to all enabled destinations.

<b>origin-id hostname   ip   ipv6   string  </b>	Adds origin ID to syslog messages.
<b>rate-limit &lt;1-10000&gt; except &lt;0-7&gt;   &lt;4096-32768&gt;   alert   critical   debugging   emergencies   errors   informational   notifications   warnings  </b>	Configure message per second limit.
<b>source interface bvi &lt;1-9999&gt;   dot11radio &lt;0-4&gt;   ethernet &lt;1-2   openvpn-tunnel &lt;0-999&gt;   tunnel &lt;0-999&gt;  </b>	Configure the interface for source address in logging transactions.
<b>trap &lt;0-7&gt;   &lt;4096-32768&gt;   alert   critical   debugging   emergencies   errors   informational   notifications   warnings }</b>	Configure syslog server logging level.
<b>Command Default</b>	logging buffered 4096 debugging logging console debugging logging monitor debugging
<b>Command Modes</b>	Perle(config)#logging
<b>Usage Guidelines</b>	Use this command to enable logging settings.
<b>Examples</b>	This example enables logging to host 172.16.55.88. Perle(config)#logging 172.16.55.88
<b>Related Commands</b>	<i>show lldp</i>

## login

### login

```
{on-failure every <1-65535> | log every <1-65535> | trap every <1-65535> | [on-success every <1-65535> | log every <1-65535> | trap every <1-65535>]}
```

<b>Syntax Description</b>	<b>login</b>
---------------------------	--------------

---

<b>{on-failure every &lt;1-65535&gt;   log every &lt;1-65535&gt;  trap every &lt;1-65535&gt;  </b>	Configure options for failed login attempt.
--	---

<b>[on-success every &lt;1-65535&gt;   log every &lt;1-65535&gt;  trap every &lt;1-65535&gt;]}</b>	Configure options for successful login attempt.
--	---

---

<b>Command Modes</b>	Perle(config)#login
----------------------	---------------------

---

### Usage Guidelines

Use this command to set parameters for users log in attempts.

### Examples

This example logs failed login attempts.

```
Perle(config)#login on-failure
```

### Related Commands

*logging*

## mac

```
{access-list <WORD> |  
export <WORD> url flash: | ftp: | http: | https: | scp: | sftp: | tftp: |  
import <WORD> interface bvi <1-9999> | dot11radio <1-1> | ethernet <1-2> .  
<1-4000> | url flash: | ftp: | http: | https: | scp: | stfp: | tftp:}
```

Use the no form of this command to negate a command or set to defaults.

---

<b>Syntax Description</b>	<b>mac access-list</b>
---------------------------	------------------------

---

<b>{access-list &lt;WORD&gt;  </b>	Configure a MAC access list name.
------------------------------------	-----------------------------------

<b>export &lt;WORD&gt; url flash:   ftp:   http:   https:   scp:   sftp:   tftp:  </b>	Exports MAC access list to a server.
--	--------------------------------------

<b>import &lt;WORD&gt; interface bvi &lt;1-9999&gt;   dot11radio &lt;1-1&gt;   ethernet &lt;1-2&gt; . &lt;1-4000&gt;   url flash:   ftp:   http:   https:   scp:   stfp:   tftp:}</b>	Import formats are; <ul style="list-style-type: none"> <li>● xxxx.xxxx.xxxx—Cisco format where xxxx is 1-4 digits</li> <li>● xx:xx:xx:xx:xx:xx—where xx is 1-2 digits</li> <li>● aabbccddeeff</li> <li>● Import from supported interface</li> <li>● ethernet interfaces</li> <li>● sub-ethernet (VLANs) interfaces</li> <li>● dot11radio (SSID 0-1 in AP mode)</li> <li>● bridge interfaces</li> </ul>
---	--

---

**Command Default****Notes:**

- There are no defaults when configuring the MAC access-group and policy, but the no/default policy after initial configuration, is Disabled
- No and default commands operate the same for all interface types
- If there is no MAC access-group specified, the no/default command REMOVES the MAC access-group and policy
- If a MAC access-group is specified the default policy: disabled is configured and applied

---

**Command Modes**Perle(config)#mac

---

**Usage Guidelines**

Use this command to create a host MAC address list.

**Policy descriptions**

**Permit**—allow all MAC addresses in this MAC access list, deny all MAC addressees not in this list.

**Deny**—deny all MAC addresses in this MAC access list, allow all others not in the list

**Disable**—not active

MAC address list can also be created by importing CSV files.

---

**Examples**

This example assigns access-list eth1-macs to interface ethernet 1 with all addresses within the eth1-macs policy to be accepted or permitted on this interface.

```
Perle(config)#interface ethernet 1
Perle(config)#mac-access-list eth1-macs-static
Perle(config-mac-acl)#
```

---

This example imports a <mac-list-csv.txt> file from host 172.16.4.182 using http protocol.

```
Perle(config)#mac access-list import <mac-list-csv.txt> url
http://172.16.4.182/pub/<mac-list-csv.txt>
Connected to 172.16.4.182.
59 bytes copied in 0.009 seconds (6319 bytes/sec)
Waiting for download to complete . . .
% Successfully processed 4 properly formatted MAC addresses
```

This example exports a <mac-list-csv.txt> file to 172.16.4.182 using tftp protocol.

```
Perle(config)#mac access-list export <mac-list-csv.txt> url tftp://172.16.4.182/<mac-
list-csv.txt>
Accessing tftp://172.16.4.182/<macs-export-file>
60 bytes copied in 0.003 seconds (21030 bytes/sec)
```

This example imports and permits MAC addresses from BVI interface 10 into bridge-mac-list.

```
Perle(config)#mac access-list import bridge-mac-list interface bvi 10
Perle(config)#interface bvi 10
Perle(config-if)#mac access-group bridge-mac-list permit
```

---

## Related Commands

*show mac*

*(config-mac-acl)*

## (config-mac-acl)

```
{description <LINE> |
host src-mac-address <H.H.H>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-mac-acl)#
{description <LINE>		Configure a MAC access-list description.
host src-mac-address <H.H.H>}		Configure the source address of the host you want to add to this list.
<b>Command Modes</b>		Perle(config-mac-acl)#

---

## Usage Guidelines

Use this command to enter MAC address to this MAC address list.

---

## Examples

This example adds host mac address aaaa.bbbb.cccc to the list.

```
Perle(config-mac-acl)#host src-mac-addr aaaa.bbbb.cccc
```



**Related Commands***show mac***management-access****management-access** {enable | from-lan | from-wan}**Syntax Description****management-access**

{enable	Enables management access. Default is enabled
from-lan	Enters the configuration menu for defining management access from the LAN.
from-wan	Enters the configuration menu for defining management access from the WAN.
<b>Command Default</b>	LAN—all protocols enabled except SNMP WAN—all protocols are disabled.
<b>Command Modes</b>	Perle(config)#management-access

**Usage Guidelines**

Use this command to enter the configuration menu for the management access you wish to set.

With in the "from-LAN" and "from-WAN" sub menu, you will be able to enable/disable the following management access methods.

Management Methods are:

- Enable—All management Access methods for this interface
- HTTP—Enable HTTP (Web) management Access for this interface
- HTTPS—Enable HTTPS (Web) management access for this interface
- Telnet—Enable Telnet management access for this interface
- SSH—Enable SSH management access for this interface
- SNMP—Enable SNMP management access for this interface

**Related Commands***(management-access-LAN)**(management-access-WAN)***(management-access-LAN)**

```
{http enable |
https enable |
snmp enable |
ssh enable |
```

**telnet enable}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(management-access-LAN)
<b>{http enable  </b>	Enables devices connected from the LAN side with Role set to LAN to use HTTP to connect to the IOLAN.
<b>https enable  </b>	Enables devices connected from the LAN side with Role set to LAN to use HTTPS to connect to the IOLAN.
<b>snmp enable  </b>	Enables devices connected from the LAN side with Role set to LAN to use HTTPS to connect to the IOLAN.
<b>ssh enable  </b>	Enables devices connected from the LAN side with Role set to LAN to use ssh to connect to the IOLAN.
<b>telnet enable}</b>	Enables devices connected from the LAN side with Role set to LAN to use telnet to connect to the IOLAN.
<b>Command Default</b>	All methods are enabled on the LAN side. All methods are disabled on the WAN side.
<b>Command Modes</b>	Perle(config)#management-access-lan

**Usage Guidelines**

Use this comment to set protocols to allow entry from the LAN side to manage the IOLAN.

**Examples**

This example sets management access telnet for LAN devices.

```
Perle(config)#management-access from-LAN
Perle(management-access-lan)#telnet enable
```

**Related Commands**

*(management-access-LAN)*

*(management-access-WAN)*

**(management-access-WAN)**

```
{http enable |
https enable |
snmp enable |
ssh enable |
telnet enable}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(management-access-WAN)
{ <b>http enable</b>	Enable devices connected from the WAN side with Role set to WAN to use HTTP to connect to the IOLAN.
<b>https enable</b>	Enables devices connected from the WAN side with Role set to WAN to use HTTPS to connect to the IOLAN.
<b>snmp enable</b>	Enables devices connected from the WAN side with Role set to WAN to use SNMP to connect to the IOLAN.
<b>ssh enable</b>	Enables devices connected from the WAN side with Role set to WAN to use ssh to connect to the IOLAN.
<b>telnet enable</b> }	Enables devices connected from the WAN side with Role set to WAN to use telnet to connect to the IOLAN.
<b>Command Default</b>	All protocols are disabled.
<b>Command Modes</b>	management-accessfrom-lan

### Usage Guide

Use this command to set protocols to allow entry from the WAN side to manage the IOLAN.

### Examples

Configure management access for wan devices using ssh.  
 Perle(config)# management-access from-WAN  
 Perle(config-management-access-WAN)#ssh enable

### Related Commands

([config-mac-acl](#))

## nat66

### nat66

{**prefix outside** <X:X:X:X::X:X>/<0-128> **any inside** <X:X:X:X::X:X>/<0-128>  
**outside-interface cellular** <0-0> | **no-strict**}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	nat66
--------------------	-------

---

```
{prefix outside
<X:X:X:X::X:X>/<0-128> any
inside <X:X:X:X::X:X>/<0-
128> outside-interface | no-
strict}
```

Configure parameters for NAT66.

**Command Modes**

nat66

**Usage Guidelines**

Use this command to configure NAT66 parameters. In its simplest form, a NAT66 device is attached to two network links, one of which is an "internal" network link and the other of which is an "external" network with connectivity to the global Internet. All of the hosts on the internal network use addresses from a single, locally-routed prefix, and those addresses are translated to/from addresses in a globally-route-able prefix as IP packets transit the NAT66 device.

**Examples**

This example sets any outside packets with an IPv6 header of 2001:db8:0:2::/64 to be converted to an IPv6 header of 2001:db8:0:12::/64 on outbound interface cellular 0.

```
nat66 prefix outside 2001:db8:0:2::/64 inside 2001:db8:0:12::/64 outside-interface
cellular 0
```

**Related Commands**

*show nat66*

**network-watchdog****network-watchdog**

```
{router}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****network-watchdog**

```
{router}
```

Configure the watchdog timer.

**Command Modes**

network watchdog

**Usage Guidelines**

Use this command to enter sub-menu mode for watch dog timer.

**Examples**

This example takes you to sub-menu mode for watchdog timer feature.

```
network-watchdog router
```

---

**Related Commands***(config-network-watchdog)***(config-network-watchdog)**

```
{count <1-10> | enable | [fail-action notifications-only | notifications-reset] |
interval <1-180> | response <1-3600> | source-interface [bvi <1-9999>] | [cellular
<0-0>] | [dialer <0-15>] | [dot11radio <0-4>] | [ethernet <1-2>] | [open-tunnel <0-
999>] | [tunnel <0-999>] | [target <A.B.C.D> | <WORD> | <X:X:X:X::X>] |
[threshold-count <1-30>]}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-network-watchdog)**

---

```
{count <1-10> | enable | [fail-
action notifications-only |
notifications-reset] | interval
<1-180> | response <1-3600> |
source-interface [bvi <1-
9999>] | [cellular <0-0>] |
[dialer <0-15>] | [dot11radio
<0-4>] | ethernet <1-2> | [open-
tunnel <0-999>] | [tunnel <0-
999>] | [target <A.B.C.D> |
<WORD> | <X:X:X:X::X>] |
[threshold-count <1-30>]}
```

Configure parameters for network watchdog.

**Fail-action**

- notify only
- notify and reboot

**Interval** to wait between tests. Values are 1 to 180 minutes. Default: IOLAN is 20 minutes.

**Interval** to wait between tests. Values are 1 to 180 minutes. Default IOLAN is 20 minutes.

**Response**—Time to wait for a response to the ping request. Values are 1 to 3600 seconds. Default is 5 seconds.

**Source-interface**—Specify the interface to send the ping request on (optional). Values are:

- BVI 1–9999
- dialer 1–15
- ethernet *1-2*
- openvpn 0–999
- tunnel 0–999

**Target**—Enter the target host IPv4, IPv6 or hostname address.

**Threshold count**—The consecutive failed test count to trigger an Fail-action. Value is 1 to 30

---

**Command Modes**


---

Perle(config-network-watchdog)#

---

### Usage Guidelines

Use this command to configure the Network Watchdog timeout action. When configured, the watchdog feature runs continuous ping tests. Each ping test is comprised of one or more ping attempts. If all of the pings in a test fail, the test has failed, if one ping test passes, the test is considered to have passed.

The watchdog feature is triggered after a successful connection, which is defined as one successful test. After which your tests will run as defined..

If any of the ping test fail, the IOLAN and modem notifies the user and/or can reset the IOLAN and modem.

---

### Examples

This example configures the watchdog timer on Ethernet interface 2 to ping target host 172.16.1.1 with a count of 10.

```
Perle(config-network-watchdog)#count 10
```

```
Perle(config-network-watchdog)#target 172.16.1.1
```

```
Perle(config-network-watchdog)#source interface ethernet 2
```

---

### Related Commands

*show network-watchdog*

## ntp

### ntp

{**authentication** |

**authentication-key** <1-65534> **md5** <WORD> 0 | 7 |

**broadcastdelay** <1-999999> |

**logging** |

**master** <1-15> | **peer** <A.B.C.D> <WORD> <X:X:X:X::X> **ip** <hostname-of-peer> **ipv6** <hostname-of-peer> | **key** <1-65534> | **maxpoll** <4-17> | **minpoll** <4-17> | **prefer** | **version** <1-4> |

**server** <A.B.C.D> <WORD> <X:X:X:X::X> **ip** <hostname-of-peer> **ipv6** <hostname-of-peer> | **key** <1-65534> | **maxpoll** <4-17> | **minpoll** <4-17> | **prefer** | **version** <1-4> |

**trusted-key** 1-65534}

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

### ntp

{**authentication** |

Configure authentication of time sources. The time sources must authenticate with each other before synchronizing clock time.

<b>authentication-key</b> <1-65534> <b>md5</b> <WORD> <0   7>	Configure the authentication key to be exchanged between time sources before clock synchronizing begins. 0—unencrypted key 7—encrypted key
<b>broadcastdelay</b> <1-999999>	Configure the broadcast delay timer. By default, the sets broadcast delay to Auto-negotiate. Select the auto-negotiate broadcast delay off if you wish to set your own broadcast delay time in microseconds. Broadcast delay time is the estimated round-trip delay between the broadcast NTP server and the .
<b>logging</b>	Logs NTP messages to the internal log.
<b>master</b> <1-15>   <b>peer</b> <A.B.C.D> <WORD> <X:X:X:X::X> <b>ip</b> <WORD> <b>ipv6</b> <WORD>>   <b>key</b> <1-65534>   <b>maxpoll</b> <4-17>   <b>minpoll</b> <4-17>   <b>prefer</b>   <b>version</b> <1-4>	Configure to use LTE as a time source.  Configure master or peer as the source clock. The stratum defines how far away the clock is away from the Authoritative Time Source. The highest stratum is 1. It is reserved for atomic clocks, GPS clocks or radio clock which generates a very accurate time. This type of time source is defined as the “Authoritative time source”. The stratum defines how many hops a node is from the “authoritative time source”. Stratum x nodes are synchronized to stratum x-1 nodes. Stratum numbers range from 1 to 15. Configure the IPv4/IPv6 address or hostname of the NTP peer that you are getting the clock from. Select prefer to use this NTP source over another.  A preferred peer's responses are discarded only if they vary greatly from the other time sources. Otherwise, the preferred peer is used for synchronization without consideration of the other time sources.

---

```

server <A.B.C.D> <WORD>
<X:X:X:X::X> ip <WORD>
ipv6 <WORD>> | key <1-
65534> | maxpoll <4-17> |
minpoll <4-17> | prefer |
version <1-4> |

```

Configure the IPv4/IPv6 address or hostname of the NTP peer that you are getting the clock from. Select prefer to use this NTP source over another. A preferred server's responses are discarded only if they vary greatly from the other time sources. Otherwise, the preferred server is used for synchronization without consideration of the other time sources.

Changes to the polling interval is not recommended and is discouraged. NTP dynamically selects the optimal poll interval between the values of minpoll and maxpoll, which defaults to 64 and 1024 seconds respectively and are correct for most environments.

Shorter values are used to correct large errors and larger values are to refine accuracy.

Default is minimum poll 64.

Versions 1 to 4 are supported

---

```

trusted-key 1-65534}

```

Configure a trusted key to be used for trusted time sources.

---

#### Command Modes

ntp

---

#### Usage Guidelines

Use this command to distribute and maintain synchronization of time information between nodes in a network. NTP server uses UTC (Universal Coordinated Time). When initially launched, it can take NTP as much as 5 minutes to obtain an accurate time. This is due to the algorithm used to determine what NTP master(s) the should synchronize with. NTP will not synchronize with nodes whose time is significantly off even if its stratum is lower. During this "settling" period, the may not have the correct time. NTP can usually achieve time synchronization between two systems in the order of a few milliseconds. This is achieved with a time transmission rate of as little as one packet per minute.

---

#### Examples

```

ntp server 172.16.4.181
23:40:31: %NTPD-5: ntpd 4.2.8p6@1.3265-o Wed May 18 14:33:49 UTC 2016
(10): Starting
23:40:31: %NTPD-6: Command line: ntpd -n -g
23:40:31: %RSYSLOGD-6: LOGGINGHOST_STARTSTOP: Logging to UDP host

```



```

172.16.55.88 port 514 started
23:40:31: %NTPD-6: proto: precision = 3.840 usec (-18)
23:40:31: %NTPD-6: Listen and drop on 0 v6wildcard [::]:123
23:40:31: %NTPD-6: Listen and drop on 1 v4wildcard 0.0.0.0:123
23:40:31: %NTPD-6: Listen normally on 2 lo 127.0.0.1:123
23:40:31: %NTPD-6: Listen normally on 3 VI1 172.16.113.77:123
23:40:31: %NTPD-6: Listen normally on 4 lo [::1]:123
23:40:31: %NTPD-6: Listen normally on 5 Gi2 [fe80::6ac9:bff:fec1:58da%4]:123
23:40:31: %NTPD-6: Listen normally on 6 Gi1 [fe80::6ac9:bff:fec1:58d9%3]:123
23:40:31: %NTPD-6: Listen normally on 7 eth0 [fe80::6ac9:bff:fec1:58d8%2]:123
23:40:31: %NTPD-6: Listening on routing socket on fd #38 for interface updates
23:40:31: %NTPD-3: Unable to listen for broadcasts, no broadcast interfaces
available
23:40:31: %NTPD-6: 0.0.0.0 c01d 0d kern kernel time sync enabled
23:40:31: %NTPD-6: 0.0.0.0 c012 02 freq_set kernel 0.000 PPM
23:40:31: %NTPD-6: 0.0.0.0 c011 01 freq_not_set
23:40:31: %NTPD-6: 0.0.0.0 c016 06 restart
ntp status
Clock is synchronized, stratum 12, reference is 172.16.4.180
Precision is 2**-18 s
Reference time is dae84dc5.33013328 (Thu, May 19 2016 10:35:49.199)
Clock offset is 7.595002 msec, root delay is 0.439 msec
Root dispersion is 7956.293 msec

```

### Related Commands

*show ntp*

## policy-map

```

{<WORD> |
priority-queue <WORD> |
rate-control <WORD> bandwidth <1-2000000> |
traffic-limit <1-2000000>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
{<WORD>	<b>policy-map</b> Specifies the name of the policy map to be created or modified.
priority-queue <WORD>	Configure priority-queue policy-map. See <a href="#">(config-pmapPQ)</a>
rate-control <WORD> bandwidth <1-2000000>	Configure rate-control policy-map. See <a href="#">(config-pmapRC)</a>
traffic-limit <1-2000000>}	Configure traffic-limit policy-map. See <a href="#">(config-pmapTL)</a>

**Command Modes**

policy-map

**Usage Guidelines**

Use this command to create a policy-map. A policy map references class maps and identifies a series of actions to perform based on the traffic match criteria. A policy map essentially defines a policy stating what happens to traffic that has been classified using class maps and ACLs.

Your provides you with three mechanisms for configuring Quality of Service (QOS).

**1) Priority-queuing**—packets are placed in queues, high priority packets are sent first.

**2) Rate-control**—rate control is a classless policy that limits the packet flow to a set rate. Traffic is filtered based on the expenditure of tokens. Tokens roughly correspond to bytes. Short bursts can be allowed to exceed the limit. On creation, the Rate-Control traffic is stocked with tokens which correspond to the amount of traffic that can be burst in one go. Tokens arrive at a steady rate, until the bucket is full.

**3) Traffic-limiting**—traffic limiting is a mechanism that can be used to "police" incoming traffic. The mechanism assign each traffic flow a bandwidth limit. All incoming traffic within a flow in excess of the bandwidth is dropped. This policy can be applied to both ingress and egress packets.

**Examples**

Creates a policy-map called test-policy.

```
(config)# policy-map test-policy
(config-pmap
```

**Related Commands**

*(config-pmap)*

*(config-pmap-c)*

*(config-pmapRC)*

*(config-pmapPQ)*

*(config-pmapPQ-c)*

*(config-pmapTL)*

**(config-pmap)**

```
{bandwidth <1-2000000> |
class <1-4094> | default |
description <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-pmap)**

```
{bandwidth <1-2000000> |
```

Configure the available bandwidth in Kbps for this policy.  
Default is to match interface speed.

```
class <1-4094> | default |
```

Configure a class identifier.  
Values are 1–4094

---

**description** <LINE>} Configure policy map description.

---

**Command Modes** Perle(config-pmap)#

---

### Usage Guidelines

Configure parameters for his policy map.

---

### Examples

Configures class identifier as 10.

```
Perle(config-pmap)#class 10
```

```
Perle(config-pmap-c)#
```

---

### Related Commands

*policy-map*

*(config-pmap-c)*

### (config-pmap-c)

```
{bandwidth <1-2000000> | percent <1-100> |
```

```
burst <1-20000> |
```

```
ceiling <1-2000000> | percent <1-100> |
```

```
codei-flows <1-4294967295> |
```

```
codei-interval <1-4294967295> |
```

```
codei-quantum <1-4294967295> |
```

```
codei-target <1-4294967295> |
```

```
description <LINE> |
```

```
queue-limit <1-4294967295> |
```

```
queue-type <1-4294967295> |
```

```
set-dscp <0-63>}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description (config-pmap-c)

---

<b>{bandwidth</b> <1-2000000>	Configure the base guaranteed bandwidth for this traffic class (in Kbps or in percent). Bandwidth must be below the entire bandwidth set for this policy.
-------------------------------	---

---

<b>burst</b> <1-20000>	Configure the burst size for this class. Values are 1 to 20000 in Kbytes. Default is 15 Kbytes
------------------------	--

---

<b>ceiling</b> <1-200000>   <b>percent</b> <1-100>	<p>Configure a bandwidth ceiling for a traffic class in Kbps.</p> <ul style="list-style-type: none"> <li>• Percentage based on interface physical rate</li> <li>• Must be equal or greater then specified bandwidth</li> </ul> <p>Default is 100 percent of bandwidth if no ceiling specified.</p>
<b>codel-flows</b> <1-4294967295>	<p>Configure the number of flows into which the incoming packets are classified.</p> <p>Values are 1 to 4294967295</p> <p>Default is 1024</p>
<b>codel-interval</b> <1-4294967295>	<p>Configure the interval to the measured minimum delay as not to become stale. It should be set on the order of the worst-case round trip time (RTT) through the bottleneck to give endpoints sufficient time to react.</p> <p>Values are 1 to 4294967295 milliseconds.</p> <p>Default is 100 milliseconds.</p>
<b>codel-quantum</b> <1-4294967295>	<p>Configure the maximum amount of bytes dequeued from a queue at once.</p> <p>Values are 1 to 4294967295</p> <p>Default is 1514</p>
<b>codel-target</b> <1-4294967295>	<p>Configure the minimum standing/persistent queue delay.</p> <p>Values are 1 to 4294967295 milliseconds</p> <p>Default is 5 milliseconds</p>
<b>description</b> <LINE>	<p>Configure a description for this traffic class.</p>
<b>queue-limit</b> <1-4294967295>	<p>Configure the maximum size for this traffic class.</p> <p>Values are 1 to 4294967295 milliseconds</p> <p>Default is none</p>
<b>queue-type</b>	<p>Configure the type of queuing to use for this traffic class.</p> <ul style="list-style-type: none"> <li>• fq-code1</li> <li>• fair-queue</li> <li>• drop-tail</li> <li>• priority</li> <li>• random-detect</li> </ul> <p>Default is fair-queue</p>

---

```
set-dscp <0-63>}
```

Rewrites the DSCP field in packets in this traffic class to the specified value.

Values are 0–63

Binary value	Configured value	Drop rate	Description
101110	46	-	Expedited forwarding (EF)
000000	0	-	Best effort traffic, default
001010	10	Low	Assured Forwarding(AF) 11
001100	12	Medium	Assured Forwarding(AF) 12
001110	14	High	Assured Forwarding(AF) 13
010010	18	Low	Assured Forwarding(AF) 21
010100	20	Medium	Assured Forwarding(AF) 22
010110	22	High	Assured Forwarding(AF) 23
011010	26	Low	Assured Forwarding(AF) 31
011100	28	Medium	Assured Forwarding(AF) 32
011110	30	High	Assured Forwarding(AF) 33
100010	34	Low	Assured Forwarding(AF) 41
100100	36	Medium	Assured Forwarding(AF) 42
100110	38	High	Assured Forwarding(AF) 43

Default is none

---

## Command Modes

(config-pmap)#

---

## Usage Guidelines

Use this command to specify the Quality of Service (QoS) settings applied to the default class. You configure your default traffic in the same way you do with a class. Default is considered a class as it behaves like that. It contains any traffic that did not match any of the defined classes, so it is like an open class, a class without matching filters.

---

## Examples

Set the queue type for this traffic class to random-detect.

```
Perle(config-pmap)#class 10
```

```
Perle(config-pmap-c)#queue-type random-detect
```

---

## Related Commands

*policy-map*

*(config-pmap)*

## (config-pmapRC)

```
{bandwidth <1-2000000> |
```

```
burst <1-20000> |
```

```
description <LINE> |
```

```
latency <1-5000>}
```

Use the no form of this command to negate a command or set to defaults.

---

## Syntax Description

**(config-pmapRC)**

---

<b>{bandwidth &lt;1-200000&gt;  </b>	Changes configured bandwidth limit.
<b>burst &lt;1-2000&gt;  </b>	Configure a burst size in kbytes. Default is 15Kbps
<b>description &lt;LINE&gt;  </b>	Configure a Policy-Map Rate-Control description.
<b>latency &lt;1-500&gt;}</b>	Configure the limit on queue size. This is the maximum amount of time a packet can sit in the Token Bucket Filter. Packets with more latency than this value will be dropped since they are no longer considered useful. Value is 1 to 500 milliseconds Default is 50 milliseconds
<b>Command Modes</b>	Perle(config-pmapRC)#

---

### Usage Guidelines

Use this command to configure parameters for Rate-control policy. This policy is egress only.

Rate Control is a classless policy that limits the packet flow to a set rate. It provides queuing on the Token Bucket filter algorithm. This algorithm only passes packets arriving at a rate which does not exceed an administratively set rate. Traffic is filtered based on the expenditure of these tokens.

Tokens roughly correspond to bytes. Short bursts can be allowed to exceed the limit. Once created, the rate control traffic is stocked with tokens which correspond to the amount of traffic that can be burst in one go. Tokens arrive at a steady rate, until the bucket is full—newly arriving tokens are discarded. To send a packet, the regulator must remove from the bucket a number of tokens equal in representation to the packet size.

### Examples

Set the latency for this rate-control policy to 100 milliseconds.

```
Perle(config)#policy-map rate-control factory-RC bandwidth 2000
```

```
Perle(config-pmapRC)#latency 100
```

### Related Commands

[\*policy-map\*](#)

### (config-pmapPQ)

```
{class <1-7> | default |
```

```
description <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

### Syntax Description

(config-pmapPQ)

---

<b>{class &lt;1-7&gt;   default  </b>	Configure a priority queue class identifier.
<b>description &lt;LINE&gt;}</b>	Configure the description of this Priority Queue policy-map.
<b>Command Modes</b>	Perle(config-pmapPQ)#

---

### Usage Guidelines

Use this command to create a Priority-Queue Policy map. This policy is egress only. Your has four types of outbound traffic queues based on priority: low, normal, medium, and high. These outbound traffic queues are divided into seven priority queues (see table below). The queue priority determines the order of exit for packets in the queue. For example, the packets in a high priority (6–7) queue leave the before packets in other queues. If packets continually fill the higher priority queues, those waiting in lower priority queues will not be serviced until the higher priority traffics load finishes.

Priority Assigned to Packet	Port Queue	Priority	Order of Exit
6-7	6-7	High	1
4-5	4-5	Medium	2
0, 3	0, 3	Normal	3
1-2	1-2	Low	4

---

### Examples

This example creates a priority queue called important with a class identifier of 7.

```
Perle(config)#policy-map priority-queue priority
Perle(config-pmapPQ)#class 7tricky sok
```

---

### Related Commands

*policy-map*  
(*config-pmapPQ-c*)

### (*config-pmapPQ-c*)

```
{code1-flows <1-4294967295> |
code1-interval <1-4294967295> |
code1-quantum <1-4294967295> |
code1-target <1-4294967295> |
description <LINE> |
queue-limit <1-4294967295> |
queue-type drop-tail | fair-queue | fq-code1 | priority | random-detect |
set-dscp <0-63>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description** (*config-pmapPQ-c*)

---

<b>{codel-flows</b> <1-4294967295>	Configure the number of flows into which the incoming packets are classified. Values are 1 to 4294967295 Default is 1024
<b>codel-interval</b> <1-4294967295>	Configure the interval to the measured minimum delay so as not to become stale. It should be set on the order of the worst-case round trip time (RTT) through the bottleneck to give endpoints sufficient time to react. Values are 1 to 4294967295 milliseconds. Default is 100 milliseconds.
<b>codel-quantum</b> <1-4294967295>	Configure the maximum amount of bytes dequeued from a queue at once. Values are 1 to 4294967295 Default is 1514
<b>codel-target</b> <1-4294967295>	Configure the minimum standing/persistent queue delay. Values are 1–4294967295 milliseconds Default is 5 milliseconds
<b>description</b> <LINE>	Configure a policy map class description.
<b>queue-limit</b> <1-4294967295>	Configure maximum queue size in packets.
<b>queue-type</b> drop-tail   fair-queue   fq-code1   priority   random-detect	Specifies the type of queuing to use for this traffic class. <ul style="list-style-type: none"> <li>● Drop Tail</li> <li>● Fair-queuing</li> <li>● fqcode1</li> <li>● priority</li> <li>● random-detect</li> </ul>



---

```
set-dscp <0-63>}
```

Rewrites the DSCP field in packets in this traffic class to the specified value.

Values are 0–63

Binary value	Configured value	Drop rate	Description
101110	46	-	Expedited forwarding (EF)
000000	0	-	Best effort traffic, default
001010	10	Low	Assured Forwarding(AF) 11
001100	12	Medium	Assured Forwarding(AF) 12
001110	14	High	Assured Forwarding(AF) 13
010010	18	Low	Assured Forwarding(AF) 21
010100	20	Medium	Assured Forwarding(AF) 22
010110	22	High	Assured Forwarding(AF) 23
011010	26	Low	Assured Forwarding(AF) 31
011100	28	Medium	Assured Forwarding(AF) 32
011110	30	High	Assured Forwarding(AF) 33
100010	34	Low	Assured Forwarding(AF) 41
100100	36	Medium	Assured Forwarding(AF) 42
100110	38	High	Assured Forwarding(AF) 43

Default is none

---

## Command Modes

Perle(config-pmapPQ-c)#

---

## Usage Guide

Use this command to set parameters for your defined priority queue policy map.

---

## Examples

This example sets the queue-type to fair-queue.

```
Perle(config)#policy-map priority-queue priority-voice
```

```
Perle(config-pmapPQ)#class 1
```

---

## Related Commands

*policy-map*

### (config-pmapTL)

```
{class <1-4094> bandwidth <1-2000000> | default |  
description <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

### (config-pmapTL)

```
{class <1-4094> | default |
```

Configure a priority queue class identifier or default.

```
description <LINE>}
```

Configure the description of this Traffic Limiting policy-map.

---

<b>Command Modes</b>	Perle(config-pmapTL)#
----------------------	-----------------------

---

**Usage Guidelines**

Use this command to configure the parameters for policy map. This traffic policy mechanism is to "police" in coming traffic. The mechanism assign each traffic flow a bandwidth limit. All incoming traffic within a flow in excess of the bandwidth is dropped. This policy can be applied to both ingress and egress packets.

**Examples**

Creates a policy-map called test-policy.  
 Perle(config)# policy-map test-policy  
 Perle(config-pmap

**Related Commands**

*policy-map*

**(config-pmapTL-c)**

```
{class <1-4094> bandwidth <1-200000> | default |
description <LINE>}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-pmapTL-c)**

<b>bandwidth</b> <1-200000>	Specifies the base guaranteed bandwidth for this traffic class (in Kbps or in percent). Bandwidth must be below the entire bandwidth set for this policy.
<b>burst</b> <1-20000>	Configure the burst size for this class. Values are 1 to 20000 in Kbytes. Default is 15 Kbytes
<b>description</b>	Configure the description of this Traffic Limiting policy-map.
<b>priority</b>	Specifies the order of evaluation of matching rules (the higher the value, the lower the priority). Values are 0 to 20. Default is 20

**Command Modes**

Perle(config-pmapTL-c)#

---

**Examples**

This example sets the bandwidth to 20000 for this traffic class.

```
Perle(config)#policy-map traffic-class test-traffic
```

```
Perle(config-pmapTL-c)#class 10
```

```
Perle(config-pmapTL-c)#bandwidth 20000
```

---

**Related Commands**

*policy-map*

## power-supply

**power** {**dual**}

This command is only available on IRG5140 models.

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****power-supply**

---

**{dual}**

Enables the monitoring of both power supplies.

---

**Command Modes**

power-supply dual

---

**Examples**

This example shows you how to configure to monitor for both power supplies.

```
Perle(config)# power-supply dual
```

**Related Commands**

*show environment*

## radius

**radius****{server <WORD>}**

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****radius**

---

**{server <WORD>}**

Configure RADIUS server name.

---

**Command Modes**

radius

---

**Usage Guidelines**

Use this command to configure the RADIUS server name.

---

**Examples**

This example configures the RADIUS server name.

```
radius server testrad
```

**Related Commands***clear radius**show radius***(config-radius-server)**

```
{address ipv4 <A.B.C.D> | acct-port <0-65536> | auth-port <0-65536> |
key 0 <WORD> | 7 <WORD> | <WORD> |
retransmit <1-100> |
timeout <1-1000>}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-radius-server)**

<b>{address ipv4 &lt;A.B.C.D&gt;   acct-port &lt;0-65536&gt;   auth-port &lt;0-65536&gt;  </b>	Configure the RADIUS server address. Default port for authentication is 1812 Default port for accounting is 1813
<b>key 0 &lt;WORD&gt;   7 &lt;WORD&gt;   &lt;WORD&gt;  </b>	Configure an encryption key to be shared with the RADIUS servers.
<b>retransmit &lt;1-100&gt;  </b>	Configure the number of retries to the active RADIUS server. Values are
<b>timeout &lt;1-1000&gt;}</b>	Configure the time to wait for the RADIUS server to reply. Values are 1–1000 Default is 5 seconds
<b>Command Modes</b>	Perle(config-radius-server)#

**Usage Guidelines**

Use this command to configure RADIUS parameters.

**Examples**

This example sets the timeout to 30 seconds to wait for a reply from a RADIUS server.

```
Perle(config-radius-server)#timeout 5
```

**Related Commands***clear radius**show radius***radius-server**

```
radius {deadtime <1-1440> |
key 0 <WORD> 7 <WORD> | <WORD> |
```

```
retransmit <1-100> |
timeout <1-1000>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	radius-server
{ <b>deadtime</b> <1-1440>	Sets the time the IOLAN ignores unresponsive RADIUS servers.
<b>key</b> 0 <WORD>7 <WORD>   <WORD>	Configure an encryption key to be shared with the RADIUS servers.
<b>retransmit</b> <1-100>	Configure the number of retries to the active RADIUS server.
<b>timeout</b> <1-1000>	Configure the time to wait for the RADIUS server to reply.
<b>Command Modes</b>	radius-server

### Usage Guidelines

Use this command to configure RADIUS server parameters.

### Examples

This example sets the radius server name.  
radius-server

### Related Commands

*clear radius*  
*show radius*

## remote-management

### remote-management

Syntax Description	remote-management
<b>Command Modes</b>	Perle(config)#remote-management
<b>Usage Guidelines</b>	Use this command to enter sub-command mode for remote management configuration.
<b>Examples</b>	This example enables remote management config mode. Perle(config)#remote-management Perle(config-remote-mgmt)#

**Related Commands***(config-remote-mgmt)***(config-remote-mgmt)**

```
{restful-api cookie-max-age |
http local-port <80, 1025-65535> |
https local-port <443, 1025-65535>|
jwt [claims aud <WORD> | exp <1-3153600> | iat <WORD> | iss <WORD> | jti
<WORD> | nbf <1-31336000> | sub <WORD>] | jws [algorithm es256 | es384 |
es512 | hs256 | hs356 | hs512 | ps256 | ps 384 | ps512 | rs256 | rs384 | rs512 | none]
| key import terminal}
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-remote-mgmt)**

<b>{restful-api cookie-max-age  </b>	Enables set-cookie based authentication. Values are 1 to 20160 (14 days) Default is 1440 minutes (24 hours)
<b>http local-port  </b>	If enabled, the IOLAN accepts and responds to HTTP Restful client requests. Values for local port are 80, 1025 to 65535 Default local port is 8080 Default is Disabled
<b>https local-port  </b>	If enabled, the IOLAN accepts and responds to HTTPS Restful client requests. Values for the local port are 443, 1025 to 65535 Default is Disabled
<b>jwt [claims aud &lt;WORD&gt;   exp &lt;1-3153600&gt;   iat &lt;WORD&gt;   iss &lt;WORD&gt;   jti &lt;WORD&gt;   nbf &lt;1-31336000&gt;   sub &lt;WORD&gt;]   jws algorithm es256   es384   es512   hs256   hs384   hs512   ps256   ps 384   ps512   rs256   rs384   rs512   none]   key import terminal}</b>	<p><b>Claim sets:</b></p> <p><b>aud: audience</b>—identifies the recipients that the JWT is intended for. This tends to be the "client id" or "client key" of the application that the JWT is intended to be used by. It allows the client to verify that the JWT was sent by someone who actually knows who they are.</p> <p><b>exp: expiration time</b>—identifies the expiration time on and after which the JWT must not be accepted for processing Values are 1–3153600 seconds Default is 3153600 seconds</p>

**iat: issued at**—identifies the time on which the JWT will start to be accepted for processing

**iss: issuer**—identifies principal that issued the JWT

**jti: JWT ID**—case sensitive unique identifier of the token

**nbf: not before**—JWT will start to be accepted for processing at this time

Values are 1–3156000 seconds

**sub: subject**—identifies the subject of the JWT

**Algorithm types:**

- es256
- es384
- es512
- hs256
- hs384
- hs512
- ps256
- ps384
- ps512
- none

**key**—import the key via the terminal screen. To end entry type "quit" on a blank line by itself.

---

**Command Modes**

Perle(config-remote-mgmt)#

---

**Usage Guidelines**

Use this command to configure RESTful API options.

JSON Web Token (JWS) is an Internet standard way to securely transfer information between devices as a JSON object. This information can be verified and trusted because it is digitally signed. JSON Web Tokens (JWTs) can be signed using an algorithm or a public/private key pair.

---

**Examples**

This example sets the local port for HTTPS to 1025.

```
Perle(config-remote-mgmt)#restful-api https local-port 1025
```

## route-map

### route-map

```
{<WORD> <1-65535> [deny <1-65535> | permit <1-65535>]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	route-map
{<WORD> <1-65535> [deny <1-65535>   permit <1-65535>]}	Insert, delete, deny, or permit from existing route map table.
Command Modes	Perle(config)#route-map

### Usage Guidelines

Use this command to create route maps or enter route map command mode.

### Examples

This example creates a route map called test-route.

```
Perle(config)#route-map test-route
```

### Related Commands

*show route-map*

*(config-route-map)*

### (config-route-map)

```
{call <WORD> |
continue <1-65535> |
description <LINE> |
match | [as-path <WORD>] | [community <1-500>] | [extcommunity <1-500>] |
[interface bvi <1-9999>] | [| [dialer <0-15>] | [dot11radio <0-4>] | [ethernet <1-
2>. <1-4000>] | [openvpn-tunnel <0-999>] | [tunnel <0-999>] | [ip address <1-
199> | <1300-2699>] | [prefix-list] | [ipv6 <WORD> | prefix-list] | [metric <1-
4294967295>] | [origin egp | igp | unknown] | [peer <A.B.C.D>] | [tag <1-65535>]
|
on-match goto <1-65535> | next |
set aggregator as <1-4294967295> <A.B.C.D>] | [as-path exclude <1-
4294967295>] | [prepend <1-4294967295>] | [atomic-aggregate] | [comm-list <1-
500> delete] | [community <1-4294967295> | <AA:NN>] | [internet | local-as | no-
advertise | no export] | [ext-community rt <AA:NN> | soo <AA:NN>] | [ip
nexthop <A.B.C.D>] | [ipv6 nexthop global <X:X:X:X::X>] | [local <X:X:X:X::X>]
| [local-preference <0-4294967295>] | [metric <1-4294967295>] | [metric-type <type-
1> | <type-2>] | [origin egp | igp | unknown] | [originator-id <A.B.C.D>] | [src
<A.B.C.D>] | [tag <1-65535>] | [weight <0-4294967295>]}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-route-map)
--------------------	--------------------



<b>{call &lt;WORD&gt;  </b>	Calls to another route map.
<b>continue &lt;1-65535&gt;  </b>	Calls to another rule within the current route map. The new route map rules is called after all set actions specified in the route map rule have been performed.
<b>description &lt;LINE&gt;  </b>	Configure a route map description.
<b>match   [as-path &lt;WORD&gt;]   [community &lt;1-500&gt;]   [extcommunity &lt;1-500&gt;]   [interface bvi &lt;1-9999&gt;]   [cellular &lt;0-0&gt;]   [dialer &lt;0-15&gt;]   [dot11radio &lt;0-4&gt;]   [ethernet &lt;1-2&gt;. &lt;1-4000&gt;]   [openvpn-tunnel &lt;0-999&gt;]   [tunnel &lt;0-999&gt;]   [ip address &lt;1-199&gt;   &lt;1300-2699&gt;]   [prefix-list]   [ipv6 &lt;WORD&gt;]   [prefix-list]   [metric &lt;1-4294967295&gt;]   [origin egp   igp   unknown]   [peer &lt;A.B.C.D&gt;]   [tag &lt;1-65535&gt;]  </b>	Defines a match condition based on parameter.
<b>on-match goto &lt;1-65535&gt;   next  </b>	Specifies an alternative exit policy for a route map.
<b>set aggregator as &lt;1-4294967295&gt; &lt;A.B.C.D&gt;]   [as-path exclude &lt;1-4294967295&gt;]   [prepend &lt;1-4294967295&gt;]   [atomic-aggregate]   comm-list &lt;1-500&gt; delete]   [community &lt;1-4294967295&gt;   &lt;AA:NN&gt;]   internet   local-as   no-advertise   no export]   [ext-community rt &lt;AA:NN&gt;]   soo &lt;AA:NN&gt;]   [ip nexthop &lt;A.B.C.D&gt;]   [ipv6 nexthop global &lt;X:X:X:X::X&gt;]   local &lt;X:X:X:X::X&gt;]   local-preference &lt;0-4294967295&gt;   metric &lt;1-4294967295&gt;   [metric-type &lt;type-1&gt;   &lt;type-2&gt;]   [origin egp   igp   unknown]   [originator-id &lt;A.B.C.D&gt;]   [src &lt;A.B.C.D&gt;]   [tag &lt;1-65535&gt;]   [weight &lt;0-4294967295&gt;] }</b>	Configure values in destination routing protocol. <b>aggregator</b> —modifies the BGP aggregator attribute of a route. Specify the ASN number or the IP address of the aggregator. <b>as-path—excludes</b> —removes the AS path from a BGP AS-path attribute (up to 10 numbers) <b>as-path—prepend</b> —prepends to the AS path of the route (up to 10 numbers) <b>atomic-aggregate</b> —sets the atomic aggregate attribute in a route <b>comm-list</b> —set the BGP community list for deletion <b>community</b> —community number—configure the community number or AA:NN

---

**internet**—internet (well know community)  
**local-AS**—do not send outside local AS  
**no-advertise**—do not advertise to any peer  
**no-export**—do not export to next AS  
**ip**—modifies the next hop destination of a route  
**ipv6**—modifies the IPv6 next-hop destination of a route.  
**ocal-preference**—modifies the BGP local-pref attribute in a route  
**metric**—modifies the metric of a route  
**metric-type**—specifies the OSPF external metric-type for a route  
**origin**—modifies the BGP origin code of a route  
**originator-id**—modifies the BGP originator ID attribute of a route  
**src**—modifies th BGP source address for the route  
**tag**—modifies the OSPF tag value of a route  
**weight**—modifies the BGP weight of a route

---

### Command Modes

---

Perle(config-route-map)#

---

### Usage Guidelines

Use this command to configure route map parameters.

---

### Examples

This rule defines a match rule for community list BGP 50.  
 Perle(config-route-map)#match community 50

---

### Related Commands

*show route-map*

## router

```
router
{bgp <1-4294967295> |
ospf |
rip}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	router
<p><b>bgp</b> &lt;1-4294967295&gt;  </p>	<p>Configures Broader Gateway Protocol (BGP) routing protocol on the IOLAN. If using your router to connect to the Internet, BGP should be enabled.</p> <p>Configure the autonomous system number (ASN) is a unique number that's available globally to identify an autonomous system and which enables that system to exchange exterior routing information with other neighboring autonomous systems.</p> <p>Your service provider will assign you the first three digit for ASN, the last two digits should be unique.</p> <p>Values are 1–4294967295</p>
<p><b>ospf</b>  </p>	<p>Configure OSPF routing protocol on the IOLAN.</p> <p>Open Shortest Path First (ospf) is a protocol used to find the best paths for packets as they pass through a set of connected networks. OSFP was designed to replace the RIP protocol as it optimizes the updating up of the routing table. OSPF should be enabled on your IOLAN.</p>
<p><b>rip</b>}</p>	<p>Configure RIP routing protocol on the IOLAN.</p> <p>Routing Information Protocol (rip). Older protocol for finding the shortest path for routing information using a routing metric/hop count algorithm. RIP should be enabled on your IOLAN if there are older routers on your network that need to use RIP.</p>
<p><b>Command Modes</b></p>	<p>Perle(config)#router</p>
<p><b>Usage Guidelines</b></p>	
<p>Use this command to select the routing protocol for your .</p>	
<p><b>Examples</b></p>	
<p>This example sets the routing protocol to BGP.</p> <pre>Perle(config)#router bgp 10</pre>	

**Related Commands***show ip ospf**show ip rip***(config-router)—BGP**

```

{bgp address-family ipv4 | ipv6 unicast |
aggregate address <A.B.C.D> <A.B.C.D> as-set | summary-only |
bgp always-compare-med | [bestpath as-path | confed | ignore] | [compare-
router-id | [med confed | missing-as-worst] | [client-to-client reflection] | [cluster-
id <1-4294967295> <A.B.C.D>] | [confederation identifier <1-4294967295> |
peers <1-4294967295> <1-4294967295>] | [dampening <1-45> | <1-20000> | <1-
20000> | <1-255>] | [deterministic-med] | [enforce-first-as] | [fast-external-
failover] | [graceful-restart stalepath-time <1-3600>] | [log-neighbor-changes] |
[network import-check] | [router-id <A.B.C.D>] |
distance <1-255> <A.B.C.D> <A.B.C.D/nn> | bgp distance <1-255> <1-255> <1-
255> |
maximum-paths <1-64> ibgp <1-64> |
neighbour <A.B.C.D> <X:X:X:X::X> advertisement-interval <0-600> | allowas-
in <1-10> | [asoverride ] | [attribute-unchanged as-path | med | next-hop] |
[capability dynamic | orf prefix-list both | receive | send] | [default originate
route-map <NAME>] | [description <LINE>] | [disable-connected-check |
[distributed-list <1-99> in | out <1300-2699> in | out] | [dont't-capability-
negotiate] | [ebgp-multihop <1-255>] | [filter-list <WORD>] | [local-as <1-
4294967295> no-prepend] | [maximum-prefix <1-4294967295>] | [next-hop-self]
| [override-capability] | [passive] | [password <LINE>] | [port <1-65535>] |
[prefix-list <WORD>] | [remote-as <1-4294967295>] | remove-private-as | [route-
map <WORD> in | out] | [route-reflector -client] | [route-server-client] | [send-
community both | extended | standard] | [shutdown] | [soft-reconfiguration] |
[strict-capability-match] | [timers <0-65535> <0-65535> | connect <0-65335>] |
[ttl-security] | [unsuppress-map <WORD>] | update-source interface bvi <1-
9999> | | dialer <0-15> | | ethernet <1-2>. <1-4000> | openvpn-tunnel <0-999> |
tunnel <0-999> | <X:X:X:X::X>] | weight <1-65335> |
network <A.B.C.D> <A.B.C.D> | backdoor | route-map <WORD> |
redistribute connected | kernel | ospf | rip | static | metric <1-4294967295> |
timers bgp <0-65535> <0-65335>}

```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-router)**

```

{bgp address-family ipv4 |
ipv6 unicast |

```

Enters address family mode.

---

**aggregate address** <*A.B.C.D*>  
<*A.B.C.D*> **as-set** | **summary-**  
**only** |

Specifies the block of addresses to be aggregated.

**as-set**—specifies that the routes resulting from the aggregation include the AS-set.

**summary-only**—specifies that aggregated routes are summarized. These routes will not be advertised.

```

bgp always-compare-med |
[bestpath as-path confed |
ignore] | [compare-router-id] |
[med confed | missing-as-
worst] | [client-to-client
reflection] | [cluster-id <1-  

4294967295> <A.B.C.D>] |
[confederation identifier <1-  

4294967295> | peers <1-  

4294967295> <1-  

4294967295>] | [dampening
<1-45> | <1-20000> | <1-  

20000> | <1-255>] |
[deterministic-med] | [enforce-
first-as] | [fast-external-
failover] | [graceful-restart
stalepath-time <1-3600>] |
[log-neighbor-changes |
network import-check |
[router-id <A.B.C.D>] |

```

Configure BGP parameters.

**always-compare**—directs the to compare the MED for paths from neighbors in different autonomous systems.

Default is disabled

**best-path**

**as-path** [confed | ignore]—directs the to compare the AS paths during best-path selection

Default is does not compare

**compare-router-id**—directs the to compare identical routes received from different external peers during best path selection

Default is does not compare

**med** confed | missing-as-worst—direct the to compare the Multi Exit Discriminator (MED) among paths learned from confederation peers during best path selection

**client-to-client reflection**—enables or disables route reflection from a BGP route reflector to clients.

Default is disabled

**cluster-id**—sets the cluster ID for a BGP route reflection cluster as a 32 bit number  
Values are 1–4294967295 or IP address

Default is none

**confederation identifier** | **peers**—Defines a BGP confederation.

Values are AS number 1–4294967295

Peers range from 1–4294967295 to 1–4294967295

Values are 128 peers

**dampening**—enables or disables route dampening and sets IOLAN dampening value.

**half-life**—1 to 45 mins

Default is 15 mins

**reusing-route**—1 to 20000

Default is 750

**start-suppress-time**—to 20000

Default is 20000

---

**max-suppress-time**—1 to 255

Default is 4 x of half life

**deterministic-med**—enables or disables enforcing of deterministic MED

**enforce first-as**—forces eBGP peers to list AS number at the beginning of the AS\_path attribute in coming updates  
Default is disabled

**fast-external-failover**—immediately reset session if a link to a directly connected external peer goes down  
Default is disabled

**graceful-restart**—enables or disables graceful restart of the BGP process

Default is enabled

Graceful stale-time is 1-3600 seconds

Graceful stale time default is 360 seconds

**log-neighbor-changes**—log neighbor up/down and reset reason

Default is disable

**network import-check**—check BGP network route exists in IGP

Default is enabled

**router-id**—configure a fixed BGP router ID for the router, overriding the automate ID selection process

Default automatically selected by BGP

---

```
distance <1-255> <A.B.C.D>
<A.B.C.D/nn> | bgp distance
<1-255> <1-255> <1-255> |
```

Enter an **Administrative Distance**.

(AD) is a value that your IOLAN uses to select the best path when there are two or more different routes to the same destination from two different routing protocols. Administrative distance is the reliability of a routing protocol. A static route is normally set too 1. The smaller the administrative distance value, the more reliable the protocol. Administrative Distance is locally significant, it is not advertised to the network.

Range is 1-255 (with 1 being the most reliable) and 255 is route not used or unknown

Configure a source IP prefix address and mask.

#### **BGP distance**

Distance for external router to AS

Values are 1 to 255

Default 20

Distance for internal outer to AS

Values 1 to 255

Default is 200

Distance for local router

Value 1 to 255

Default 200

---

```
maximum-paths <1-64> ibgp
<1-64> |
```

Configure the maximum number of eBGP/iBGP paths to a destination.

ebgp values are 1 to 255

Default is 1

ibgp values are 1 to 255

Default is 1



```

neighbour <A.B.C.D>
<X:X:X:X::X>
[advertisement-interval <0-600>] | [allowas-in <1-10>] |
asoverride | [attribute-unchanged as-path | med |
next-hop] | [capability dynamic | orf prefix-list both |
receive | send] | [default originate route-map
<NAME>] | [description <LINE>] | [disable-connected-
check] | [distributed-list <1-99> in | out <1300-2699> in |
out] | [dont't-capability-negotiate] | [ebgp-multihop
<1-255>] | [filter-list <WORD>] | [local-as <1-4294967295>
no-prepend] | [maximum-prefix <1-4294967295>] | [next-hop-self]
| [override-capability] | [passive] | [password <LINE>]
| [port <1-65535>] | [prefix-list <WORD> in | out] | [remote-as
<1-4294967295>] | [remove-private-as] | [route-map <WORD> in |
out] | [route-reflector -client] | [route-server-client] | [send-
community both | extended | standard] | [shutdown] | [soft-
reconfiguration] | [strict-capability-match] | timers <0-65535>
<0-65535> | connect <0-65535> | [ttl-security hops <1-254>]
| [unsuppress-map <WORD>] | update-source
interface bvi <1-9999> | | dialer <0-15> | | ethernet <1-2>.
<1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> |
<X:X:X:X::X>] | [weight <1-65335>] |

```

Configure neighbor configuration.

**neighbor address**—specify an IPv4 or IPv6 address.

**advertisement-interval**—configure the minimum interval between sending BGP routing updates.

Values 0 to 600

Default eBGP is 30 secs

Default iBGP peers is 5 seconds

**allowas-in**—allows or disallows receiving BGP advertisements containing the AS path of the local router.

Default readvertisement is disabled.

Default is 3

**as-override**—override ASN's in outbound updates if AS-path equals remote-AS.

Only applies to eBGP neighbor.

Default is disable

**attribute-unchange**—allows the IOLAN to send updates to a neighbor with unchanged attributes.

Value is on for all if no option provided

Default is disabled

**capability**—advertise dynamic capability to this neighbor.

Default is session is brought up with minimal capability on both sides

**capability orf prefix-list [both | receive | send]**—advertises support for Outbound Route Filtering (ORF) for updating BGP capabilities advertised and received from this neighbor.

Default is the session is brought up with minimal capability on both sides.

**default-originate**—enables or disables forwarding of the default route to a BGP neighbor.

Default is disabled

**Description**—provide a description for a BGP neighbor.

**disable-connected-check**—Enables a directly connected eBGP neighbor to peer using a loopback address without adjusting the default TTL of 1.

Default is off

---

**distributed-list**—applies an access list to filter inbound/outbound routing updates from this neighbor.

Default is none

**don't capability-negotiate**—disables BGP capability negotiation

Default is capability negotiation is performed.

**ebgp-multihop**—Allows you to establish eBGP peer relationships between routers that aren't directly connected to one another.

Default is only directly connected neighbors are allowed

**filter-list**—applies an AS-path list to routing updates to this neighbor

Default is none

**local-as**—defines a local autonomous system number for eBGP peering

Default is none

**maximum-prefixes**—configure the maximum number of prefixes to accept from this neighbor before that neighbor is taken down.

Values are 1–4294967295

Default is none

**next-hop-self**—sets the local router as the next hop for this neighbor

Default is disable

**over-ride-capability**—overrides capability negotiation to allow a peering session to be established with a neighbor that does not support capabilities negotiation

Default is a session can't be established if the neighbor does not support capability negotiation

**passive**—directs the router not to initiate connections with this neighbor

**password**—Configure a BGP MD5 password

Default is none

**port**—specifies the port on which the neighbor is listening for BGP signals

Values are 1 to 65535

Default port is 179

---

**prefix-list-** applies this prefix list filter updates to/from this neighbor

Default is none

**remote-as**—Configure the autonomous system number of the neighbor.

Default is none

**remove-private-as**—directs the IOLAN to remove private AS numbers from updates sent to this neighbor (eBGP only)

Default is disable (do not remove)

**route-map**—applies a route map to filter updates to/from this neighbor

Default is none

**route-reflector**—specify this neighbor as a route reflector client (iBGP only)

Default is disabled

**route-server-client**—specify this neighbor as a route server client

Default is disable

**send-community**—enables or disables the sending of community attributes to the specified neighbor

Value— no type specified send standard attributes

Default is both

**shutdown**—administratively shuts down a BGP neighbor

Default is disabled

**soft-reconfiguration**—directs the IOLAN to store received routing updates

**strict-capability-match**—directs the router to strictly match the capabilities of the neighbor

Default is disable

**timers**—

keepalive interval

Values are 0–65535

Default is 60 seconds

**holdtime**

Value are 0-65535

Default is 180 seconds

**connect**

Values are 0-65535

Default is 120 seconds

---

	<p><b>ttl-security</b>—Configure the time-to-live (ttl) security hop count. This option and <code>ebgp-multihop</code> cannot be set at the same time  Values are 1 to 254 hops  Default is 1</p> <p><b>unsuppress-map</b>—directs the IOLAN to selectively advertise routes suppressed by aggregating addresses, based on a route map  Value specify a router map</p> <p><b>update-source</b>—specifies the source ip address or interface for routing updates  Default is none</p> <p><b>weight</b>—defines a default weight for routes from this neighbor  Values are 1-65335  Default is routes learned from a BGP neighbor have a weight of 0. Routes sourced by the local router have a weight of 32768</p>
<p><b>network</b> <i>&lt;A.B.C.D&gt;</i>  <i>&lt;A.B.C.D&gt;</i>   <b>backdoor</b>   <b>route-map</b> <i>&lt;WORD&gt;</i>  </p>	<p>Configure a network to be advertised by the BGP routing process.  <b>Backdoor</b>—indicates that this network is reachable by a backdoor rote. A backdoor network is considered to be like a local network but is not advertised.  <b>Route-map</b>—specifies a configured route map to be used when advertising the network  Default is none</p>
<p><b>redistribute</b> <b>connected</b>   <b>kernel</b>   <b>ospf</b>   <b>rip</b>   <b>static</b>   <b>metric</b> <i>&lt;1-4294967295&gt;</i>   <b>route-map</b> <i>&lt;WORD&gt;</i>  </p>	<p>Select route type for redistribution.  BGP.  Connected (directly attached subnet or host)</p> <ul style="list-style-type: none"> <li>• Kernel</li> <li>• OSPF</li> <li>• RIPng</li> <li>• Static</li> </ul> <p>Select a router map from the drop-down list.</p>

	<p>Configure the metric used by the routing protocol to calculate the best path to a given destination.</p> <p>Value range is 1-4294967295</p> <p>A route map consists of a series of statements to check if the route matches the policy, then it permits or denies the route.</p> <p>Default is none</p>
<pre>timers bgp &lt;0-65535&gt; &lt;0-65335&gt;}</pre>	<p>Configure BGP times globally for the local IOLAN.</p> <p>keepalive interval Values are Default is 60 seconds</p> <p>Hold-time Values are Default is 180 seconds</p>
<b>Command Modes</b>	Perle(config-router)#

### Usage Guidelines

Use this command to configure BGP protocol parameters.

### Examples

This example sets BGP timers keepalive to 10 and hold time to 20 seconds.

```
Perle(config-router)#timers bgp 10 20
```

### Related Commands

*show bgp*

### (config-router-af)

```
{aggregate-address <A.B.C.D> <A.B.C.D> as-set summary-only |
exit-address-family |
maximum-path <1-255> | ibgp <1-255> |
neighbour <A.B.C.D> <X.X.X.X::X> advertisement-interval <0-600> | allowas-
in <1-10> | [asoverride ] | [attribute-unchanged as-path | med | next-hop] |
[capability dynamic | orf prefix-list both | receive | send] | [default originate
route-map <NAME>] | [description <LINE>] | [disable-connected-check |
distributed-list <1-99> in | out <1300-2699> in | out] | [dont't-capability-
negotiate] | [ebgp-multihop <1-255>] | [filter-list <WORD>] | [local-as <1-
4294967295> no-prepend] | [maximum-prefix <1-4294967295>] | [next-hop-self]
| [override-capability] | [passive] | [password <LINE>] | [port <1-65535>] |
[prefix-list <WORD>] | [remote-as <1-4294967295>] | remove-private-as | [route-
map <WORD> in | out] | [route-reflector -client] | [route-server-client] | [send-
```

**community both | extended | standard | [shutdown] | [soft-reconfiguration] | [strict-capability-match] | [timers <0-65535> <0-65535> | connect <0-65335> | [ttl-security] | [unsuppress-map <WORD>] | update-source interface bvi <1-9999> | | dialer <0-15> | | ethernet <1-2>. <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> | <X:X:X:X::X> | weight <1-65335> | network <A.B.C.D> backdoor | mask <A.B.C.D> | route-map <WORD>}**  
 Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-router-af)**

<b>{aggregate-address &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; as-set summary-only  </b>	Specifies the block of addresses to be aggregated. <b>as-set</b> —specifies that the routes resulting from the aggregation include the AS-set. <b>summary-only</b> —specifies that aggregated routes are summarized. These routes will not be advertised.
<b>exit-address-family  </b>	Exit family level menu.
<b>maximum-path &lt;1-255&gt;   ibgp &lt;1-255&gt;  </b>	Configure the maximum number of eBGP/iBGP paths to a destination. ebgp values are 1 to 255 Default is 1 ibgp values are 1 to 255 Default is 1
<b>neighbour &lt;A.B.C.D&gt; &lt;X:X:X:X::X&gt; advertisement-interval &lt;0-600&gt;   allowas-in &lt;1-10&gt;   [asoverride ]   [attribute-unchanged as-path   med   next-hop]   [capability dynamic   orf prefix-list both   receive   send]   [default originate route-map &lt;NAME&gt;]   [description &lt;LINE&gt;]   [disable-connected-check   [distributed-list &lt;1-99&gt; in   out &lt;1300-2699&gt; in   out]   [dont't-capability-negotiate]   [ebgp-multihop &lt;1-255&gt;]   [filter-list &lt;WORD&gt;]   [local-as &lt;1-4294967295&gt; no-prepend]   [maximum-prefix &lt;1-4294967295&gt;]   [next-hop-self]   [override-capability]   [passive]   [password</b>	Configure neighbor configuration. <b>neighbor address</b> —specify an IPv4 or IPv6 address. <b>advertisement-interval</b> —configure the minimum interval between sending BGP routing updates. Values 0 to 600 Default eBGP is 30 secs Default iBGP peers is 5 seconds <b>allowas-in</b> —allows or disallows receiving BGP advertisements containing the AS path of the local router. Default readvertisement is disabled. Default is 3 <b>as-override</b> —override ASN's in outbound updates if AS-path equals remote-AS. Only applies to eBGP neighbor. Default is disable

```

<LINE>| [port <1-65535>] |
[prefix-list <WORD>] |
[remote-as <1-4294967295>] |
remove-private-as | [route-
map <WORD> in | out] |
[route-reflector -client] |
[route-server-client] | [send-
community both | extended |
standard] | [shutdown] | [soft-
reconfiguration] | [strict-
capability-match] | [timers <0-
65535> <0-65535> | connect
<0-65335>] | [ttl-security] |
[unsuppress-map <WORD>] |

```

**attribute-unchange**—allows the IOLAN to send updates to a neighbor with unchanged attributes.

Value is on for all if no option provided  
Default is disabled

**capability**—advertise dynamic capability to this neighbor.

Default is session is brought up with minimal capability on both sides

**capability orf prefix-list [both | receive | send]**—advertises support for Outbound Route Filtering (ORF) for updating BGP capabilities advertised and received from this neighbor.

Default is the session is brought up with minimal capability on both sides.

**default-originate**—enables or disables forwarding of the default route to a BGP neighbor.

Default is disabled

**Description**—provide a description for a BGP neighbor.

**disable-connected-check**—Enables a directly connected eBGP neighbor to peer using a loopback address without adjusting the default TTL of 1.

Default is off

**distributed-list**—applies an access list to filter inbound/outbound routing updates from this neighbor.

Default is none

**don't capability-negotiate**—disables BGP capability negotiation

Default is capability negotiation is performed.

**ebgp-mulihop**—Allows you to establish eBGP peer relationships between routers that aren't directly connected to one another.

Default is only directly connected neighbors are allowed

**filter-list**—applies an AS-path list to routing updates to this neighbor

Default is none

---

**local-as**—defines a local autonomous system number for eBGP peering  
Default is none

**maximum-prefixes**—configure the maximum number of prefixes to accept from this neighbor before that neighbor is taken down.

Values are 1–4294967295  
Default is none

**next-hop-self**—sets the local router as the next hop for this neighbor  
Default is disable

**over-ride-capability**—overrides capability negotiation to allow a peering session to be established with a neighbor that does not support capabilities negotiation

Default is a session can't be established if the neighbor does not support capability negotiation

**passive**—directs the router not to initiate connections with this neighbor

**password**—Configure a BGP MD5 password  
Default is none

**port**—specifies the port on which the neighbor is listening for BGP signals  
Values are 1 to 65535  
Default port is 179

**prefix-list**—applies this prefix list filter updates to/from this neighbor  
Default is none

**remote-as**—Configure the autonomous system number of the neighbor.  
Default is none

**remove-private-as**—directs the IOLAN to remove private AS numbers from updates sent to this neighbor (eBGP only)  
Default is disable (do not remove)

**route-map**—applies a route map to filter updates to/from this neighbor  
Default is none

**route-reflector**—specify this neighbor as a route reflector client (iBGP only)  
Default is disabled



---

**route-server-client**—specify this neighbor as a route server client

Default is disable

**send-community**—enables or disables the sending of community attributes to the specified neighbor

Value— no type specified send standard attributes

Default is both

**shutdown**—administratively shuts down a BGP neighbor

Default is disabled

**soft-reconfiguration**—directs the IOLAN to store received routing updates

**strict-capability-match**—directs the router to strictly match the capabilities of the neighbor

Default is disable

**timers**—

keepalive interval

Values are 0–65535

Default is 60 seconds

**holdtime**

Value are 0-65535

Default is 180 seconds

**connect**

Values are 0-65535

Default is 120 seconds

**ttl-security**—Configure the time-to-live (ttl) security hop count. This option and ebgp-multihop cannot be set at the same time

Values are 1 to 254 hops

Default is 1

**unsuppress-map**—directs the IOLAN to selectively advertise routes suppressed by aggregating addresses, based on a route map

Value specify a router map

**update-source**—specifies the source ip address or interface for routing updates

Default is none

**weight**—defines a default weight for routes from this neighbor  
 Values are 1-65335  
 Default is routes learned from a BGP neighbor have a weight of 0. Routes sourced by the local router have a weight of 32768

**network** <A.B.C.D> **backdoor**  
 | **mask** <A.B.C.D> | **route-map**  
 <WORD> }

Configure a network to be advertised by the BGP routing process.  
**Backdoor**—indicates that this network is reachable by a backdoor route. A backdoor network is considered to be like a local network but is not advertised.  
**Route-map**—specifies a configured route map to be used when advertising the network  
 Default is none

### (config-router)—OSPF

{ospf [area <0-4294967295> | <A.B.C.D> **authentication message-digest**] |  
 [default-cost <1-6777215>] | [nssa no-summary | translate |-always | translate-candidate | translate-never] | [range <A.B.C.D> <A.B.C.D> **advertise** | not-  
 advertise cost <0-16777215> | substitute <A.B.C.D> <A.B.C.D> cost <0-  
 16777215>] | [shortcut enable | disable | default] | [stub no-summary] | [virtual-link <A.B.C.D> **authentication-key** <WORD> | message-digest message-digest-key <1-255> md5 <LINE> | null] | [dead-interval <1-65535>] | [hello-interval <1-65535>] | [retransmit-interval <1-65535>] | [transmit-delay<1-65535>] |  
 auto-cost reference-bandwidth <1-4294967> |  
 capability opaque |  
 compatibility rfc1583 |  
 default-information originate always | metric <0-16777214> | metric-type <1-2> |  
 route-map <WORD> |  
 default-metric <0-16777214> |  
 max-metric router-lsa administrative | on-shutdown <5-86400> | on-startup <5-86400> |  
 neighbor poll-interval <1-65535> | priority <0-255> |  
 network <A.B.C.D> <A.B.C.D> area <0-4294967295> |  
 passive-interface bvi <1-9999> | dialer <0-15> | | ethernet <1-2>. <1-4000> |  
 openvpn-tunnel <0-999> | tunnel <0-999> | all |  
 redistribute connected | kernel | ospf | rip | static | metric <1-4294967295> |  
 route-map <WORD> |  
 refresh timer <5-1800> |  
 router-id <A.B.C.D> |

**timers throttle spf** <1-60000> <1-60000><1-60000>}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-router)
<pre>{ospf [area &lt;0-4294967295&gt;   &lt;A.B.C.D&gt; authentication message-digest   default-cost &lt;1-6777215&gt;   nssa no- summary   translate  -always   translate-candidate   translate- never]   [range &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; advertise   not- advertise cost &lt;0-16777215&gt;   substitute &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; cost &lt;0-16777215&gt;]   [shortcut enable   disable   default]   [stub no-summary]   [virtual-link &lt;A.B.C.D&gt; authentication-key &lt;WORD&gt;  authentication-key &lt;WORD&gt;   message-digest message- digest-key &lt;1-255&gt; md5 &lt;LINE&gt;   null]   [dead-interval &lt;1-65535&gt;]   [hello-interval &lt;1-65535&gt;]   [retransmit- interval &lt;1-65535&gt;]   [transmit-delay&lt;1-65535&gt;]   auto-cost reference-bandwidth &lt;1-4294967&gt;   capability opaque   compatibility rfc1583   default-information originate always   metric &lt;0-16777214&gt;   metric-type &lt;1-2&gt;   route-map &lt;WORD&gt;   default-metric &lt;0- 16777214&gt;   max-metric router-lsa administrative   on- shutdown &lt;5-86400&gt;   on- startup &lt;5-86400&gt;  neighbor poll-interval &lt;1-65535&gt;   priority &lt;0-255&gt;   network &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; area &lt;0- 4294967295&gt;   capability opaque   compatibility rfc1583  </pre>	<p>Configure OSPF area parameters.</p> <p><b>Area</b>—OSPF area ID in decimal format or IP address format</p> <p><b>Authentication</b>—enables message-digest authentication</p> <p><b>Default-cost</b>—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214 Default is none</p> <p><b>NSSA</b></p> <ul style="list-style-type: none"> <li>• No summary—Configure the OSPF VRF instance to not inject the inter-area routes into NSSA.</li> <li>• Candidate translate—Configure the NSSA-ABR always to translate election. Default is enabled</li> <li>• Always translate—Configure the NSSA-ABR never to translate. Default is enabled</li> <li>• Never translate—Configure the NSSA-ABR server never to translate. By default this is disabled</li> </ul> <p><b>Range</b>—Configure a prefix specified as IP address and subnet mask.</p> <ul style="list-style-type: none"> <li>• <b>Advertise</b>—sets the address range status to advertise and generates a Type 3 summary LSA.</li> <li>• <b>Not-advertise</b>—sets the address range status to DoNotAdvertise. The Type 3 summary LSA is suppressed and the component networks remain hidden from other networks.</li> <li>• <b>Substitute</b>—(network prefix to be announced instead of range). The default is advertise</li> <li>• <b>Cost</b>—Configure the metric for this area range. Range is 0 to 16777215</li> </ul>

```

capability opaque |
compatibility rfc1583 |
default-information originate
always | metric <0-16777214> |
metric-type <1-2> | route-map
<WORD> | default-metric <0-
16777214> | max-metric
router-lsa administrative | on-
shutdown <5-86400> | on-
startup <5-86400> | neighbor
poll-interval <1-65535> |
priority <0-255> |
network <A.B.C.D>
<A.B.C.D> area <0-
4294967295> |
passive-interface bvi <1-9999>
| dialer <0-15> | | ethernet <1-
2>. <1-4000> | openvpn-tunnel
<0-999> | tunnel <0-999> | all |
redistribute connected | kernel
| ospf | rip | static | metric <1-
4294967295> | route-map
<WORD> |
refresh timer <5-1800> |
router-id <A.B.C.D> |
timers throttle spf <1-600000>
<1-600000><1-600000>}

```

**Shortcut**—This parameter allows to "shortcut" routes (non-backbone) for inter-area routes.

- enable—use this area for shortcutting
- disable—never use this are for route shortcutting
- default—use this area for shortcutting—only if the ABR does not have a link to the backbone area or this link was lost

**stub no-summary**—no-summary option creates a totally stubby area. A totally stubby area keeps only the intra-area routes (the O routes), and for any inter-area routing, it has a default route

**Virtual Link IP Address**—IPv4 address of this virtual link.

**Authentication**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Authentication-key—Configure an authentication key for simple password authentication.
- Message-digest—(Optional) Identifies the key ID and key (password) used between this router and neighboring routers for MD5 authentication.

**Shortcut**—This parameter allows to "shortcut" routes (non-backbone) for inter-area routes.

- enable—use this area for shortcutting
- disable—never use this are for route shortcutting.
- default—use this area for shortcutting—only if the ABR does not have a link to the backbone area or this link was lost

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---

**Virtual Link IP Address**—IPv4 address of this virtual link.

**Authentication**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Authentication-key—Configure an authentication key for simple password authentication.
- Message-digest—(Optional) Identifies the key ID and key (password) used between this router and neighboring routers for MD5 authentication.

The default is none.

**Dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the IOLAN declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all IOLANs attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**Hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**Retransmit interval**—Configure the time between link-state advertisement (LSA) retransmissions for adjacencies that belong to the virtual link.

Default is 5

**Transmit delay**—Before a link-state update packet is propagated out of an interface, the routing device increases the age of the packet. The transit delay sets the estimated time required to transmit a link-state update on the interface. By default, the transit delay is 1 second. You should never have to modify the transit delay time. To avoid LSAs from aging out during transmission, set an LSA retransmission delay especially for low speed links.

Default is 5 seconds.

<b>auto-cost reference-bandwidth</b> <1-4294967>	Directs the IOLAN to use reference bandwidth method for calculating administrative costs. Default reference bandwidth is 108 Mbps.
<b>capability opaque</b>	Enables support for opaque link-state advertisement as described in RFC2370. Default is disabled
<b>compatibility rfc1583</b>	Indicates whether handing of AS external routes should comply with RFC 1583. Default is disabled.
<b>default-information originate</b> <b>always</b>   <b>metric</b> <0-16777214>   <b>metric-type</b> <1-2>   <b>route-map</b> <WORD>	Sets the characteristics of an external default route originated into an OSPF routing domain. Default is off
<b>default-metric</b> <0-16777214>	Configure a default metric to be applied to routes being distributed into OSPF. Range is 0–16777214 Default is none
<b>default-metric</b> <0-16777214>	Configure a default metric to be applied to routes being distributed into OSPF. Range is 0–16777214 Default is none
<b>distance</b> <1-255>   [ <b>ospf</b> <b>external</b> <1-255>]   [ <b>inter-area</b> <1-255>]   [ <b>intra-area</b> <1- 255>]	Enter an <b>Administrative Distance</b> . (AD) is a value that your IOLAN uses to select the best path when there are two or more different routes to the same destination from two different routing protocols. Administrative distance is the reliability of a routing protocol. A static route is normally set too 1. The smaller the administrative distance value, the more reliable the protocol. Administrative Distance is locally significant, it is not advertised to the network. Range is 1-255 (with 1 being the most reliable) and 255 is route not used or unknown Value is 1-255 Default is 110

	<p><b>OSPF External</b>—Sets the OSPF for routes injected by redistribution. Range is 1–255 Default is 110</p> <p><b>OSFP inter-area routes</b>—Sets the OSPF administrative distance by route type. Routes from another area are inter-area. Range is 1–255 Default is 110</p> <p><b>OSFP intra-area routes</b>—Sets the OSPF administrative distance by route type. Routes within an area are intra-area. Range is 1–255 Default is 110</p>
<p><b>max-metric router-lsa administrative   on-shutdown &lt;5-86400&gt;   on-startup &lt;5-86400&gt;  </b></p>	<p>Enables or disables the OSFP maximum / infinite-distance metric.</p> <p><b>Administratively</b>—administratively applied for an indefinite period</p> <p><b>on shutdown</b>—advertise stub-router prior to full shutdown of OSPF</p> <p><b>on-startup</b>—advertise a maximum metric at startup. on shutdown/on-startup value is 5–86400 seconds Range is 5 to 86400 seconds Default is 600 seconds</p>
<p><b>neighbor poll-interval &lt;1-65535&gt;   priority &lt;0-255&gt;  </b></p>	<p>Configure the dead-router polling interval for non-broadcast neighbor. Values are 1-65535 in seconds Default is 120 in seconds</p> <p>Priority of non-broadcast neighbor. Values are 0-255 Default is 1</p>
<p><b>max-metric router-lsa administrative   on-shutdown &lt;5-86400&gt;   on-startup &lt;5-86400&gt;  </b></p>	<p>Configure a default metric to be applied to routes being distributed into OSPF. Range is 0–16777214 Default is none</p>

---

```
neighbor poll-interval <1-65535> | priority <0-255> |
```

Enter an **Administrative Distance**. (AD) is a value that your uses to select the best path when there are two or more different routes to the same destination from two different routing protocols. Administrative distance is the reliability of a routing protocol. A static route is normally set too 1. The smaller the administrative distance value, the more reliable the protocol. Administrative Distance is locally significant, it is not advertised to the network. Range is 1-255 (with 1 being the most reliable) and 255 is route not used or unknown Value is 1-255 Default is 110

**OSPF External**—Sets the OSPF for routes injected by redistribution. Range is 1–255 Default is 110

**OSFP inter-area routes**—Sets the OSPF administrative distance by route type. Routes from another area are inter-area. Range is 1–255 Default is 110

**OSFP intra-area routes**—Sets the OSPF administrative distance by route type. Routes within an area are intra-area. Range is 1–255 Default is 110

---

```
network <A.B.C.D> <A.B.C.D> area <0-4294967295> <A.B.C.D> |
```

Configure IPv4 network address. Configure IPv4 wildcard address. Configure the area id or ip address.

---

```
passive-interface bvi <1-9999> | | dialer <0-15> | | ethernet <1-2>. <1-4000> | tunnel <0-999> | all |
```

Suppresses routing updates on an interface or all interfaces.

---

```
redistribute connected | kernel | ospf | rip | static | metric <1-4294967295> | route-map <WORD> |
```

Redistributes information from other routing protocols.

Select the type of route:

- BGP
- Connected (directly attached subnet or host)



	<ul style="list-style-type: none"> <li>• Kernel</li> <li>• OSPF</li> <li>• Static</li> </ul> <p>Select the route map.</p>
<b>refresh timer</b> <5-1800>	<p>The IOLAN automatically updates link-state information with its neighbors. Only an obsolete information is updated when age has exceeded a specific threshold. Range is 10–1800 seconds Default is 1800 seconds</p>
<b>router-id</b> <A.B.C.D>	<p>Configure a global OSPF router ID. If this command is not configured, OSFP chooses an IPv4 address as the router ID from one of its interfaces. If this command is used on an OSPF instance that has neighbors, OSFP uses the new router ID at the next reload or restart of OSFP.Router-ID for this OSPF process.</p>
<b>timers throttle spf</b> <1-600000> <1-600000> <1-600000> }	<p>Delay between receiving a change to SPF calculation in milliseconds. Range is 1–600000 milliseconds Default is 1 milliseconds</p> <p>Delay between first and second SPF calculation. Range is 1–600000 milliseconds Default is 1 milliseconds</p> <p>Maximum wait time in milliseconds for SFP calculations. Range is 1–600000 milliseconds Default is 1 milliseconds</p>
<b>Command Modes</b>	Perle(config-router)#
<b>Usage Guidelines</b>	Use this command to configure OSPF protocol parameters.
<b>Examples</b>	<p>This example sets opaque feature for OSPF.</p> <pre>Perle(config-router)#capability opaque</pre>
<b>Related Commands</b>	<i>show ip ospf</i>

**(config-router)—RIP**

```

{rip default-information originate |
default-metric <1-16> |
distance <1-255> |
distribution-list [<1-99> | <1300-2699> | prefix <WORD>] | [in | out] [bvi <1-
9999>] | [cellular <0-0>] | [dialer <0-15>] | [dot11radio <0-4>] | [ethernet <1-2> .
<1-4000>] | [openvpn-tunnel <0-999>] | [tunnel <0-999>] |
neighbor <A.B.C.D> |
network <A.B.C.D> <A.B.C.D> |
passive-interface bvi <1-9999> | cellular <0-0> | dialer <0-15> | dot11radio <0-4>
| ethernet <1-2>. <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> | all |
redistribute connected | kernel | ospf | rip | static | metric <1-4294967295> |
route-map <WORD> |
timers basic <5-2147483> <5-2147483> <5-2147483>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-router)
<b>rip default-information originate</b>	Controls distribution of default information.
<b>default-metric &lt;1-16&gt;</b>	Configure the metric for redistributed routes.
<b>distance &lt;1-255&gt;</b>	Configure the administrative distance.
<b>distribution-list</b> [ <1-99>   <1300-2699>   <b>prefix &lt;WORD&gt;</b> ]   [in   out] [bvi <1-9999>]   [cellular <0-0>]   [dialer <0-15>]   [dot11radio <0-4>]   [ethernet <1-2>. <1-4000>]   [openvpn-tunnel <0-999>]   [tunnel <0-999>]	Filters networks in routing updates. Select the IP access list number or filter prefix list name. Specific whether the filter is for inbound or outbound. Specify the interface to apply this distribution list to.
<b>neighbor &lt;A.B.C.D&gt;</b>	Configure a neighbor router.
<b>network &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;</b>	Enables routing on a specified interface or network.
<b>passive-interface bvi &lt;1-9999&gt;</b>   <b>cellular &lt;0-0&gt;</b>   <b>dialer &lt;0-15&gt;</b>   <b>dot11radio &lt;0-4&gt;</b>   <b>ethernet &lt;1-2&gt;. &lt;1-4000&gt;</b>   <b>openvpn-tunnel &lt;0-999&gt;</b>   <b>tunnel &lt;0-999&gt;</b>   <b>all</b>	Suppress routing updates on an interface.

---

**redistribute connected | kernel | ospf | rip | static | metric <1-4294967295> | route-map <WORD> |**

---

Redistribute information from other routing protocol.

**timers basic <5-2147483> <5-2147483> <5-2147483>}**

---

**Timers basic**—  
Interval between updates for RIP  
Values are 5-2147483 in seconds  
Default is  
Invalid in secnds  
Values are 5-2147483  
Default is  
Flush in seconds  
Values are 5-2147483

---

**Command Modes**

Perle(config-router)#

---

**Usage Guidelines**

Use this command to configure RIP protocol parameters.

---

**Examples**

This example sets timer for RIP updates to every 5 minutes.

Perle(config-router)#timers basic 5

---

**Related Commands**

*router*

## sdm

**sdm**

**{prefer default | dual-ipv4-and-ipv6 default}**

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description**

**sdm**

---

**{prefer default | dual-ipv4-and-ipv6 default}**

The sdm command is used to set IP protocols on your IOLAN.

---

**Command Default**

(both IPV4 and IPV6 enabled)

---

**Command Modes**

Perle(config)#sdm

---

**Usage Guidelines**

By default the IOLAN is set to enable both IPv4 and IPv6.

## Examples

This example sets your IOLAN for both IPv4 and IPv6 traffic.

```
Perle(config)# sdm prefer dual-ipv4-and-ipv6 default
```

## serial

### serial

```
{accounting <WORD> | default |
advanced [break off | on] | data_logging_buffer_size <1-2000> | [flush-on-close
off | on] | [line-menu-string <WORD>] |[monitor-connection-every <1-32767>] |
monitor-connection-number <1-32767>] | monitor-connection-timeout<1-
32767> | single-telnet off | on] |
authentication aaa login-authentication <WORD> | default |
authorization exec <WORD> | default |
modbus gateway addr-mod embedded | re-mapped] | [broadcast on | off] | char-
timeout <10-10000> | [exceptions off | on] | [idle-timer <0-300>] | [ip-aliasing off
| on] | mess-timeout <10-10000> | next-req-delay <0-1000> | port <1-65535> |
remapped-id <1-247> | [req- off | on] | [ssl on | off] |
port buffering key-stroke-buffering on | off] | mode both | local | off | remote |
nsf-directory <WORD> | nfs-encryption off | on | [nfs-host <A.B.C.D> <WORD>
<X:X:X:X::X>] | syslog [level alert | critical | emergency | error | info | notice |
warning] | off | on] | [time-stamp off | on] | view-port-buffer-string <WORD> |
trueport [remap 110 | 1200 | 134 | 150 | 1800 | 19200 | 200 | 2400 | 300 | 38400 |
4800 | 50 | 600 | 75 | 9600] | [[115200 | 1200 | 1800 | 19200 | 23400 | 2400 | 38400 |
4800 | 57600 | 600 | 9600 | custom |
vmodem-phone entry <1-8> phone-number <phone -number> | host <A.B.C.D>
<WORD> <X:X:X:X::X> <tcp-port>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
{accounting <WORD>   default	Configure accounting parameters.
advanced [break off   on]   data_logging_buffer_size <1-2000>   [flush-on-close off   on]   [line-menu-string <WORD>]   [monitor-connection-every <1-32767>]   monitor-connection-number <1-32767>]	Configure advanced features for serial devices. Default for line-menu-string is ~menu
monitor-connection-timeout <1-32767>   single-telnet off   on]	

<b>authentication aaa login-authentication</b> <i>&lt;WORD&gt;</i>   <b>default</b>	Configure authentication parameters.
<b>authorization exec</b> <i>&lt;WORD&gt;</i>   <b>default</b>	Configure authorization parameters.
<b>modbus gateway addr-mod embedded</b>   <b>re-mapped</b>   [ <b>broadcast on</b>   <b>off</b> ]   <b>char-timeout</b> <i>&lt;10-10000&gt;</i>   [ <b>exceptions off</b>   <b>on</b> ]   [ <b>idle-timer</b> <i>&lt;0-300&gt;</i> ]   [ <b>ip-aliasing off</b>   <b>on</b> ]   <b>mess-timeout</b> <i>&lt;10-10000&gt;</i>   <b>next-req-delay</b> <i>&lt;0-1000&gt;</i>   <b>port</b> <i>&lt;1-65535&gt;</i>   <b>remapped-id</b> <i>&lt;1-247&gt;</i>   [ <b>req-off</b>   <b>on</b> ]   [ <b>ssl on</b>   <b>off</b> ]	Configure modbus gateway parameters.
<b>port buffering key-stroke-buffering on</b>   <b>off</b>   <b>mode both</b>   <b>local</b>   <b>off</b>   <b>remote</b>   <b>nsf-directory</b> <i>&lt;WORD&gt;</i>   <b>nfs-encryption off</b>   <b>on</b>   [ <b>nfs-host</b> <i>&lt;A.B.C.D&gt;</i> <i>&lt;WORD&gt;</i> <i>&lt;X:X:X:X::X&gt;</i> ]   <b>syslog</b> [ <b>level alert</b>   <b>critical</b>   <b>emergency</b>   <b>error</b>   <b>info</b>   <b>notice</b>   <b>warning</b> ]   <b>off</b>   <b>on</b> ]   [ <b>time-stamp off</b>   <b>on</b> ]   <b>view-port-buffer-string</b> <i>&lt;WORD&gt;</i>	Configure port buffering parameters.
<b>trueport</b> [ <b>remap</b> <b>110</b>   <b>1200</b>   <b>134</b>   <b>150</b>   <b>1800</b>   <b>19200</b>   <b>200</b>   <b>2400</b>   <b>300</b>   <b>38400</b>   <b>4800</b>   <b>50</b>   <b>600</b>   <b>75</b>   <b>9600</b> ]   <b>115200</b>   <b>1200</b>   <b>1800</b>   <b>19200</b>   <b>23400</b>   <b>2400</b>   <b>38400</b>   <b>4800</b>   <b>57600</b>   <b>600</b>   <b>9600</b>   <b>custom</b>	Configure remap baud rates for Trueport devices.
<b>vmodem-phone entry</b> <i>&lt;1-8&gt;</i> <b>phone-number</b> <i>&lt;phone-number&gt;</i>   <b>host</b> <i>&lt;A.B.C.D&gt;</i> <i>&lt;WORD&gt;</i> <i>&lt;X:X:X:X::X&gt;</i> <i>&lt;tcp-port&gt;</i> }	Configure parameters for virtual modem.

Command Modes

Perle(config)#serial

---

**Usage Guidelines**Serial advanced feature settings

---

**Examples**

This example sets the vmodem phone number to 416-666-9900 for host 172.16.77.88.  
 Perle(config)#serial vmodem entry 1 phone-number 416-666-9900 host 172.16.77.88

---

**Related Commands***serial**show serial***service****service**

```
{dhcp relay-agent | server |
dhcpv6 server |
[sequence-numbers] |
[timestamps log datetime | localtime | msec | show-time-zone | year] | uptime}}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****service****{dhcp relay-agent | server |**

Enables DHCP server or relay agent.

**dhcpv6 server |**

Enables DHCPv6 server.

**[sequence-numbers] |**

Stamps the logger messages with a sequence number.

**[timestamps log datetime | localtime | msec | show-time-zone | year] | uptime}}**

Time stamp with date, time, and system uptime.

---

**Command Modes**Perle(config)#service

---

**Usage Guidelines**Use this command to configure parameters for DHCP relay agent or server.

---

**Examples**

This example sets date, time, and year to DHCP log messages.  
 Perle(config)#service timestamp log datetime localtime year

---

**Related Commands***logging*

## snmp-server

### snmp-server

```
{community <WORD> ip-access <A.B.C.D> | network <A.B.C.D> <A.B.C.D> |
<WORD> | <X:X:X:X::X:X> | ro | rw |
contact <LINE> |
enable traps | [alarms <2 | 3> | major | minor] | authentication | bgp entity |
envmon | interface-ip | ipsec | lldp | network-watchdog | openvpn | ospf | [snmp
authentication | coldstart | linkdown | linkup | warmstart] | software-update |
engine-id local <TEXT> |
group <WORD> |
host <A.B.C.D> <WORD> udp-port <0-65535> | <X:X:X:X::X:X> <WORD>
udp-port <0-65535> | [version 2c <WORD> udp-port <0-65535>] | [3 engine-id
<WORD> | informs engine-id <WORD> | traps engine-id <WORD> | user auth
md5 <WORD> priv aes | des <WORD> | udp-port <0-65535>]
listen-address <A.B.C.D> | <X:X:X:X::X:X> udp-port <0-65535> |
location <WORD> |
user <WORD> <WORD> v3 [auth encrypted | sha <WORD> priv aes | des
<WORD>] | [encrypted auth md5 <WORD> priv aes <WORD> | sha <WORD>] |
view <WORD> excluded <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	snmp-server
<pre>{community &lt;WORD&gt; ip- access &lt;A.B.C.D&gt;   network &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;   &lt;WORD&gt;   &lt;X:X:X:X::X:X&gt; ro  </pre>	<p>Configure community strings and access privileges.</p> <p>IP-access</p> <ul style="list-style-type: none"> <li>• <b>&lt;A.B.C.D&gt;</b> IPv4 address of SNMP client allowed to contact system</li> <li>• <b>network &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;</b> subnet of SNMP clients allow to contact the system</li> <li>• <b>&lt;WORD&gt;</b> host name of the SNMP client allow to contact the system</li> <li>• <b>&lt;X:X:X:X::X:X&gt;</b> IPv6 address of the host allow to contact the system</li> </ul> <p>ro—read only access with this community string</p> <p>rw—community access with this community string</p>
<pre>contact &lt;LINE&gt;  </pre>	<p>Configure the contact name. (mib object sysContact).</p>

<b>enable traps</b>   [alarms <2   3>   major   minor]   authentication   bgp entity   envmon   interface-ip   ipsec   lldp   network-watchdog   openvpn   ospf   [snmp authentication   coldstart   linkdown   linkup   warmstart]   software-update	Enables SNMP traps and inform messages.
<b>engine-id</b> <text>	Configure the default engine-id. Your IOLAN uses the MAC address of the Ethernet interface to ensure that the Engine-id is unique to this agent. To set the engine id back to default, enter "".
<b>group</b> <WORD>	Configure a SNMPv3 user security model.
<b>host</b> <A.B.C.D> <WORD> <b>udp-port</b> <0-65535>   <X:X:X:X::X:X> <WORD> <b>udp-port</b> <0-65535>   [version 2c <WORD> <b>udp-port</b> <0-65535>]   [3 engine-id <WORD>   informs engine-id<WORD>   user auth md5 <WORD> priv aes   des <WORD>   <b>udp-port</b> <0-65535>]	Configure hosts to receive SNMP notifications. Engine ID is the remote Engine ID.
<b>listen-address</b> <A.B.C.D>   <X:X:X:X::X:X> <b>udp-port</b> <0-65535>	Configure the listen address for incoming requests.
<b>location</b> <LINE>	Configure the name for MIB object sysLocation. This is the physical location of this node.
<b>user</b> <WORD> <WORD> v3 [auth md5   sha <WORD> priv aes   des <WORD>] [encrypted auth md5 <WORD> priv aes <WORD>   sha <WORD>	Configure options for SNMP V3 user.
<b>view</b> <WORD> excluded <WORD> }	Configure a SNMPv3 MIB family view, Excludes this family MIB from the view.
<b>Command Modes</b>	Perle(config)#snmp-server



---

**Usage Guidelines**

Use this command to configure SNMP server parameters.

---

**Examples**

This example sets community name to public and contact person to admin, then enable trap messages for authentication.

```
Perle(config)#community public
```

```
Perle(config)#snmp-server contact admin
```

```
Perle(config)#snmp-server enable traps authentication
```

---

**Related Commands**

*show snmp*

**tacacs****tacacs**

```
{server <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****tacacs**

```
{server <WORD>}
```

Configure TACACS+ server name.

---

**Command Modes**

Perle(config)#tacacs

---

**Usage Guidelines**

Use this command to configure TACACS+ server name.

---

**Examples**

This example specifies the name of the TACACS+ server as TACTEST.

```
Perle(config)#tacacs server TACTEST
```

---

**Related Commands**

*clear tacacs*

*show tacacs*

**(config-tacacs-server)**

```
{address ipv4 <hostname | <A.B.C.D> | ipv6 <hostname | X:X:X:X::X> |  
key 0 <WORD> | 7 <WORD> | <WORD> |  
timeout <1-1000>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****(config-tacacs-server)**

<b>{address</b> <i>ipv4</i> <hostname   <A.B.C.D>   <i>ipv6</i> <hostname   X:X:X:X:X>	Configure the IPv4 or IPv6 address for your TACACS server.
<b>key</b> 0 <WORD>   7 <WORD>   <WORD>	Configure the encryption key to be shared with the TACACS server.
<b>timeout</b> <1-1000>}	Configure the timeout if the TACACS server doesn't respond,
<b>Command Modes</b>	Perle(config-tacacs-server)#

### Usage Guidelines

Use this command to configure TACACS+ server parameters.

### Examples

This example sets the IPv4 address for your TACACS+ server to 172.17.88.99.  
 Perle(config-tacacs-server)# address ipv4 172.17.88.99

### Related Commands

*tacacs*

*clear tacacs*

*show tacacs*

## tacacs-server

```
tacacs-server {deadtime <1-1440> |
key 0 <WORD>7 <WORD> | <WORD> |
retransmit <1-100> |
timeout <1-1000>}
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	radius-server
<b>{deadtime</b> <1-1440>	Sets the time the IOLAN ignores unresponsive TACACS+ servers.
<b>key</b> 0 <WORD>7 <WORD>   <WORD>	Configure an encryption key to be shared with the TACACS+ servers.
<b>retransmit</b> <1-100>	Configure the number of retries to the active TACACS+ server.
<b>timeout</b> <1-1000>	Configure the time to wait for the TACACS+ server to reply.
<b>Command Modes</b>	Perle(config)#tacacs-server

### Usage Guidelines

Use this command to configure TACACS+ server parameters.

---

**Examples**

This example sets the TACACS+ server name.

```
Perle(config)#tacacs-server
```

**tty****tty**

{**mode disable | line**}

Use the no form of this command to negate a command or set to defaults.

Syntax Description	tty
{ <b>mode disable   line</b> }	Configure serial port mode.
<b>Command Default</b>	Console
<b>Command Modes</b>	Perle(config)#tty

**Usage Guidelines**

Use this command to configure the mode for the tty port.

**Examples**

This example set tty port 1 to line mode.

```
Perle(config)#tty 1 mode line
```

**username****username**

{**<WORD>** |

**access schedule <1-10> <hh:mm> <hh:mm> friday | monday | saturday | sunday**

**| thursday | tuesday | wednesday |**

**nopassword |**

**openvpn-user |**

**privilege 1 | 10 | 11 | 15 |**

**secret 0 <LINE> | 5 <WORD> | <LINE> |**

**serial |**

**two-factor |**

**web-access dashboard | diagnostics | logging | monitor-statistics | reset }**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	username
{ <b>&lt;WORD&gt; nopassword  </b>	Configure local user names and passwords
<b>privilege 1   15   secret   serial  </b>	
<b>two-factor  </b>	

<b>access schedule</b> <1-10> <hh:mm> <hh:mm> <b>friday</b>   <b>monday</b>   <b>saturday</b>   <b>sunday</b>   <b>thursday</b>   <b>tuesday</b>   <b>wednesday</b> 	Configure date and time the user is allow access. Note: the user must exist to see this option.
<b>nopassword</b>	No password is required for user to log in.
<b>openvpn-user</b>	Configure user as an openVPN user.
<b>privilege 1</b>   <b>10</b>   <b>11</b>   <b>15</b>	<b>Privilege levels</b> <ul style="list-style-type: none"> <li>• 1—User Level (User Exec Only)</li> <li>• 10—User Privilege Level (Web only)</li> <li>• 11—User Privilege Level (Restful API only)</li> <li>• 15—User Privilege Level, EXEC, Web, and REST API)</li> </ul>
<b>secret 0</b> <LINE>   <b>5</b> <WORD>   <LINE>	Configure a secret or password for this user. <ul style="list-style-type: none"> <li>• 0—The unencrypted password follows</li> <li>• 5—An encrypted password follows</li> <li>• LINE—The unencrypted (cleartext) user password</li> </ul>
<b>serial</b>	This user is a serial user. Define more parameters for this user here ( <a href="#">config-user-serial</a> ). Note: user must exist to see this option.
<b>two-factor</b>	This user uses 2-factor authentication. Define more parameters for this user here ( <a href="#">config-user-2factor</a> ). Note: User must exist to see this option
<b>web-access dashboard</b>   <b>diagnostics</b>   <b>logging</b>   <b>monitor-</b> <b>statistics</b>   <b>reset</b> }	10—User Privilege Level (Web only), select the information that can be accessed by this user.
<b>Command Modes</b>	Perle(config)#username

---

## Usage Guidelines

Use this command to set user parameters.

### Privilege level

- 1—Specifies user privilege level (user exec)
- 10—User Privilege Level (Web only)
- 11—User Privilege Level Restful API only
- 15—Specifies privilege exec level (privilege exec)

### Secret

- 0—Specifies that an UNENCRYPTED password follows.
- 5—Specifies an ENCRYPTED password follows.
- LINE – the UNENCRYPTED (cleartxt) password.

---

## Examples

This example creates a user with user exec privileges and a clear text password.

```
Perle(config)#username lyn privilege 1 secret password123
```

---

## Related Commands

*show username*

*(config-user-serial)*

*(config-user-2factor)*

### (config-user-serial)

```
{callback off | on |
framed-compression off | on |
framed-interface-id <ipv6 interfac id> |
framed-ip <A.B.C.D> |
framed-mtu <64-1500> |
host-ip <Hostname> | <A.B.C.D> | <X:X:X:X::X> |
hotkey-prefix <1-ff> |
idle-timer <0-4294967> |
line-access readin <1-8> <17-24> | readout <1-8> <17-24> | readwrite <1-8> <17-
24> |
netmask <A.B.C.D> |
phone-number <phone-number> <A.B.C.D>] |
port ssh <1-65535>| ssl_raw <1-65535> | tcp-clear <1-65535> | telnet <1-65535>]
|
routing listen | none | send | send-and-listen |
service dsprompt | ppp | rlogin | slip | ssh | ssl-raw | tcp-clear | telnet] |
sess-timer <0-4294967> |
session <1-4> [auto off | on] | [rlogin-options host <hostname> | <A.B.C.D> |
<X:X:X:X::X> | termtyp <WORD>] | ssh-options | telnet-options echo <0-0x7f> |
eof <0-0x7f> | erase <0-0x7f> | escape <0-0x7f> | host <hostname> | <A.B.C.D> |
<X:X:X:X::X> | intr <0-0x7f> | [line-mode off | on] | [local-echo off | on] | [map-
cr-crlf on | off] | port <1-65535>| quit <0-0x7f> | termtyp <WORD> |
```

**type [off | rlogin | ssh | telnet]}**

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-user-serial)
<b>{callback off   on  </b>	Set the port for callback mode. <ul style="list-style-type: none"> <li>• on</li> <li>• off</li> </ul>
<b>framed-compression off   on  </b>	Configure Van Jacobson Compression. <ul style="list-style-type: none"> <li>• on</li> <li>• off</li> </ul>
<b>framed-interface-id &lt;ipv6 interface id&gt;  </b>	Configure the IPv6 interface identifier. The second part of an IPv6 unicast or anycast address is typically a 64-bit interface identifier used to identify a host's network interface. For example, if the MAC address of a network card is 00:BB:CC:DD:11:22 the interface ID would be 02BBCCFFFEEDD1122
<b>framed-ip &lt;A.B.C.D&gt;  </b>	Configure the IPv4 address
<b>framed-mtu &lt;64-1500&gt;  </b>	Configure Maximum Transmission Unit (mtu) size. Default is 1500 Values are 64 to 1500
<b>host-ip &lt;Hostname&gt;   &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;  </b>	Configure a hostname, IPv4 or IPv6 address.
<b>hotkey-prefix &lt;1-ff&gt;  </b>	The prefix that a user types to control the current session. <ul style="list-style-type: none"> <li>• Data Options: ^a number—To switch from one session to another, press ^a (Ctrl-a) and then the required session number. For example, ^2 would switch you to session 2. Pressing ^a 0 returns you to the IOLAN Menu.</li> </ul>

- **^a n**—Display the next session. The current session remains active. The lowest numbered active session is displayed.
- **^a p**—Display the previous session. The current session remains active. The highest numbered active session is displayed.
- **^a m**—To exit a session and return to the IOLAN. You are returned to the menu. The session is left running.
- **^a l**—(Lowercase L) Locks the serial port until the user unlocks it. The user is prompted for a password (any password, excluding spaces) and the serial port is locked. The user must retype the password to unlock the serial port.
- **^r**—When you switch from a session back to the Menu, the screen may not be redrawn correctly. If this happens, use this command to redraw it properly. This is always Ctrl R, regardless of the Hotkey Prefix.

The User Hotkey Prefix value overrides the Serial Port Hotkey Prefix value. You can use the Hotkey Prefix keys to lock a serial port only when the serial port's Allow Port locking parameter is enabled.

Default is Hex 01 (Ctrl -a or ^a)

---

**idle-timer** <0-4294967> |

Configure a session inactivity timer in seconds.

Default is 0 seconds so the port never times out.

Values are 0 to 4294967 seconds

---

**line-access** **readin** <1-8> <17-24> | **readout** <1-8> <17-24> | **readwrite** <1-8> <17-24> |

Configure the access for the serial lines.

---

**netmask** <A.B.C.D> |

Configure the IPv4 netmask

---

**phone-number** <phone-number> <A.B.C.D> |

Configure the call back phone number.

<b>port ssh</b> <1-65535>   <b>ssl_raw</b> <1-65535>   <b>tcp-clear</b> <1-65535>   <b>telnet</b> <1-65535>	<p>Configure the service to be used for outbound sessions on this port.</p> <ul style="list-style-type: none"> <li>• ssh</li> <li>• ssl-raw</li> <li>• tcp-clear</li> <li>• telnet</li> </ul>
<b>routing listen</b>   <b>none</b>   <b>send</b>   <b>send-and-listen</b>	<p>Configure the routing mode (RIP, Routing Information Protocol) used on the PPP/SLIP interface.</p> <ul style="list-style-type: none"> <li>• listen—enable PPP/SLIP receiving of RIP</li> <li>• none—disable PPP/SLIP sending and receiving of RIP</li> <li>• send—enable PPP/SLIP sending and receiving of RIP</li> <li>• send-and-listen—enable PP/SLIP sending and receiving of RIP</li> </ul>
<b>service dsprompt</b>   <b>ppp</b>   <b>rlogin</b>   <b>slip</b>   <b>ssh</b>   <b>ssl-raw</b>   <b>tcp-clear</b>   <b>telnet</b>	<p>Configure the service for outbound sessions.</p> <ul style="list-style-type: none"> <li>• dsprompt</li> <li>• ppp</li> <li>• rlogin</li> <li>• slip</li> <li>• ssh</li> <li>• ssl-raw</li> <li>• tcp-clear</li> <li>• telnet</li> </ul>
<b>sess-timer</b> <0-4294967>	<p>Configure the maximum session time. Default is 0 seconds so the port never times out. Values are 0 to 4294967 seconds</p>
<b>session</b> <1-4> [ <b>auto off</b>   <b>on</b> ]   [ <b>rlogin-options</b> <b>host</b> <hostname>   <A.B.C.D>   <X:X:X:X::X>]   <b>termtype</b> <WORD>]   [ <b>ssh-options</b>   <b>telnet-options</b> <b>echo</b> <0-0x7f>   <b>eof</b> <0-0x7f>   <b>erase</b> <0-0x7f>   <b>escape</b> <0-0x7f>   <b>host</b> <hostname>   <A.B.C.D>   <X:X:X:X::X>]   [ <b>intr</b> <0-0x7f>   [ <b>line-mode off</b>   <b>on</b> ]	<p>Configure user session parameters.</p>



```
[local-echo off | on] | [map-cr-
crLf on | off] | port <1-65535>|
quit <0-0x7f> | termtyp
e <WORD> | type [off | rlogin |
ssh | telnet]}
```

**Command Modes**

Perle(config-user-serial)#

**Usage Guidelines**

Use this command to configure serial parameters for the user.

**Examples**

This example sets outbound telnet session for user fred.

```
Perle(config)#username fred serial
Perle(config-user-serial)# service telnet
```

**(config-user-2factor)**

```
{email <WORD> | method email }
```

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-user-2factor)**

<code>{email &lt;WORD&gt;  </code>	Configure the email address to receive the 2factor authentication request.
<code>method email  sms  </code>	Configure the method to send 2factor authentication by E-mail or SMS message.
<code>}</code>	Configure the phone number to send 2Factor authentication requests.

**Command**

Perle(config-user-2factor)#

**Usage Guidelines**

Use this command to configure 2factor authentication parameters for a user.

**Examples**

This example sets email authentication for 2factor authentication for user fred

```
Perle(config)#username fred two-factor
Perle(config-user-2factor)#email fred@yahoo.ca
Perle(config-user-2factor)#method email
Perle(config-user-2factor)#enable
```

**Related Commands**

*email*

**wan****wan**

{**failover** | **high-availability disable** | **failover** | **load-sharing**] | **load-sharing flush-connections** | **local traffic** | **rule** <1-9999> | **source-nat** | **sticky-inbound**}

Use the no form of this command to negate a command or set to defaults.(

Syntax	Description
<b>wan</b>	
{ <b>failover</b>	Configure failover. Failover is defined as a mode where 2 or more WAN interfaces are configured, but only 1 interface is active at a time. Once IP HEALTH has detected that a WAN interface no longer has Internet connectivity, it will "failover" to the next active (via IP HEALTH status) WAN interface. <b>Note:</b> IP HEALTH profile(s) (ie. Ping or traceroute tests) and IP-HEALTH on EACH of the WAN interfaces, must be configured when using Wan high-availability. The IP HEALTH feature is used to determine whether an WAN interface has Internet connectivity (one or more of the ping or traceroute tests MUST pass).
<b>high-availability disable</b>   <b>failover</b>   <b>loadsharing</b>	Configure the action for the High-availability feature.
<b>load-sharing</b> }	Configure Load Sharing. Load Sharing defines how routed traffic is sent over one or more configured active WAN interfaces. Unlike Failover mode where ALL routed traffic is cut over to the next highest priority active WAN interface, this mode defines how specific or all traffic is to be shared or divided over multiple active WAN interfaces. This is accomplished by defining one or more Load Sharing rules. <b>Flush-connections</b> —enables flushing to flush data on WAN interface outage. <b>Local traffic</b> —enables all local traffic in the rule. <b>Rule</b> —Configure a load-sharing rule. <b>Flush-connections</b> —enables flushing to flush data on WAN interface outage.

**Local traffic**—enables all local traffic in the rule.

**Rule**—Configure a load-sharing rule.

**Flush-connections**—enables flushing to flush data on WAN interface outage.

**Local traffic**—enables all local traffic in the rule.

**Rule**—Configure a load-sharing rule.

**Source-nat**—enables/disables source address translation on this rule.

**Sticky-inbound**—enables/disables inbound connection tracking.

---

### Command Modes

Perle(config)#wan

---

### Usage Guidelines

Use this command to configure High Availability, Failover and Load Sharing features.

---

### Examples

This example sets disables the High Availability feature.

```
Perle(config)#wan high-availability disable
```

---

### Related Commands

*show wan*

### (config-wan-failover)

```
{source-interface bvi <1-9999> | cellular <0-0> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2 . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> | wan-interface bvi <1-9999> | cellular <0-0> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2 . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999>}
```

Use the no form of this command to negate a command or set to defaults.

---

### Syntax Description

### (config-wan-failover

```
{source-interface bvi <1-9999> | cellular <0-0> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2 . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> |
```

Configure the source interface.

---

**wan-interface bvi** <1-9999> |  
**cellular** <0-0> | **dialer** <0-15> |  
**dot11radio** <0-4> | **ethernet**  
 <1-2 . <1-4000> | **openvpn-**  
**tunnel** <0-999> | **tunnel** <0-  
**999>**

Configure the WAN interface.

---

**Command**

Perle(config-wan-failover)#

---

### Usage Guidelines

Use this command to configure source and WAN interfaces for failover.

---

### Examples

This example configures source interface ethernet 1 for failover mode.

Perle(config-wan-failover)#source-interface ethernet 1

---

### Related Commands

*show ip route*

*show wan*

### (config-loadshare-rule)

{**description** <LINE> |  
**exclude-rule** |  
**limit burst** <0-4294967295> | **period hour minute** | **second** | **rate** <0-4294967295>  
 | **threshold above** | **below** |  
**match protocol** <1-255> | **ah** | **dccp** | **dscr** | **egp** | **eigrp** | **encap** | **esp** | **etherip** | **ggp** |  
**gre** | **hmp** | **icmp** | **idpr** | **igmp** | **igp** | **ip** | **ipip** | **ipv6** | **ipv6-frag** | **ipv6-icmp** | **ipv6-**  
**nonxt** | **ipv6-opts** | **ipv6-route** | **isis** | **l2tp** | **manet** | **mpls-in-ip** | **narp** | **not** | **ospf** |  
**pim** | **rdp** | **rohc** | **rsvp** | **sctp** | **sdrp** | **skim6** | **skip** | **tcp** | **udp** | **udplite** | **vrp** | **xns-**  
**idp** |  
**per-packeting-sharing** |  
**source-interface bvi** <1-9999> | **cellular** <0-0> | **dialer** <0-15> | **dot11radio** <0-4>  
 | **ethernet** <1-2 . <1-4000> | **openvpn-tunnel** <0-999> | **tunnel** <0-999> |  
**wan-interface bvi** <1-9999> **weight** <1-255> | **cellular** <0-0> **weight** <1-255> |  
**dialer** <0-15> **weight** <1-255> | **dot11radio** <0-4> **weight** <1-255> | **ethernet** <1-  
**2>** **weight** <1-255> . <1-4000> **weight** <1-255> | **openvpn-tunnel** <0-999> **weight**  
 <1-255> | **tunnel** <0-999> **weight** <1-255>}  
 Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description**

(config-loadshare-rule)

---

{**description** <LINE> |

Configure the description for this rule.

---

**exclude-rule** |

Enable or disable this rule.

---

**limit burst** <0-4294967295> | **period** hour minute | second | **rate** <0-4294967295> | **threshold** above | below |

Configure packet limit for this rule.

---

**match protocol** <1-255> | ah | dccp | dsr | egp | eigrp | encap | esp | etherip | ggp | gre | hmp | icmp | idpr | igmp | igp | ip | ipip | ipv6 | ipv6-frag | ipv6-icmp | ipv6-nonxt | ipv6-opts | ipv6-route | isis | l2tp | manet | mpls-in-ip | narp | not | ospf | pim | rdp | rohc | rsvp | sctp | sdrp | skim6 | skip | tcp | udp | udplite | vrrp | xns-idp

Matches the criteria for this rule.

---

**per-packeting-sharing** |

Enables or disables per packet load sharing.

---

**source-interface** bvi <1-9999> | cellular <0-0> | dialer <0-15> | dot11radio <0-4> | ethernet <1-2 . <1-4000> | openvpn-tunnel <0-999> | tunnel <0-999> |

Select the source interface for matching criteria.

---

**wan-interface** bvi <1-9999> **weight** <1-255> | cellular <0-0> **weight** <1-255> | dialer <0-15> **weight** <1-255> | dot11radio <0-4> **weight** <1-255> | ethernet <1-2 weight <1-255> . <1-4000> **weight** <1-255> | openvpn-tunnel <0-999> **weight** <1-255> | tunnel <0-999> **weight** <1-255> }

Select WAN interface and weight for participating in this load sharing rule.

---

**Command**

Perle(config-load-sharing-rules)#

---

### Usage Guidelines

Use this command to configure load sharing rules.

---

### Examples

This example configures the BVI interface 10 to be part of WAN load sharing.

```
Perle(config-loadshare-rule)#wan bvi 10
```

---

### Related Commands

*show ip route*

*show wan*

## zone

### zone

{**security** <WORD>}

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

**zone**

{**security** <WORD>}

Name of security zone.

---

#### Command Modes

Perle(config)#zone

---

#### Usage Guidelines

Use this command to create a security zone.

---

#### Examples

This example creates a zone with the name secure1.

```
Perle(config)#zone security secure1
```

---

#### Related Commands

*zone-pair*

*show zone-policy*

### (config-sec-zone)

{**default-action** drop | reject | **description** <WORD> | **local-zone**}

Use the no form of this command to negate a command or set to defaults.

---

#### Syntax Description

**(config-sec-zone)**

{**default-action** drop | reject |

Configure the default action for traffic coming into this zone.

- Drop packets—silently drop the packets
- Reject—drops packets and notifies the source

Enter a zone description.

Zone to be local-zoned.

**description** <WORD> |

Configure security zone description.

**local-zone**}

Sets zone to be local.

---

#### Command Modes

Perle(config-sec-zone)#

---

#### Usage Guidelines

Use this command to setup a default action for zone firewall.

---

**Examples**

This example rejects all incoming packets to this zone.

```
Perle(config)# default-action reject
```

---

**Related Commands**

*show zone-policy*

*zone*

*zone-pair*

**zone-pair****zone-pair**

```
{from <WORD> to <WORD> firewall <WORD> | ipv6-firewall <WORD>}
```

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description****zone-pair**

```
{from <WORD> to <WORD>  
firewall <WORD> | ipv6-  
firewall <WORD>}
```

Configure parameters for zone pair firewalls.

- From—zone from which to filter traffic
  - To—zone to which to filter traffic
  - Firewall—select firewall to be used to filter traffic (IPv4 or IPv6)
- 

**Command Modes**

Perle(config)#zone-pair

---

**Usage Guidelines**

Use this command to create zone-pair firewalls.

---

**Examples**

This example filters traffic from lab-zone to office-z using secure zone 1.

```
Perle(config)#zone-pair from lab-zone to office-zone firewall secure1
```

Note: Secure zone 1 needs to be created first.

---

**Related Commands**

*show zone-policy*

*zone*

# 5 Interface configuration

This chapter defines all the CLI commands in Interface Configuration Mode. Some CLI commands may not be applicable to your model or running software.

## Interface

```
interface
  {bvi <1-9999> |
  cellular <0-0> |
  dialer <0-15> |
  dot11radio <0-4> |
  ethernet <1-2> |
  loopback |
  openvpn-tunnel <0-999> | tap | tun |
  tunnel <0-999> |
  range ethernet }
```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	interface
{bvi <1-9999>	Configure for a bridge interface. See <a href="#">(config-if)#bvi</a> .
dialer <0-15>	Configure for a dialer interface. See <a href="#">(config-if)#dialer</a>
ethernet <1-2>	Configure for an Ethernet interface. See <a href="#">(config-if)#ethernet</a>
loopback	Configure for a loopback interface.
openvpn-tunnel <0-999> tap   tun 	Configure for an OpenVPN tunnel interface. See <a href="#">(config-if)#openvpn-tunnel</a>
tunnel <0-999>	Configure for a tunnel interface. See <a href="#">(config-if)#tunnel</a>
range ethernet }	Configure an Ethernet range. <a href="#">(config-if-range)#</a>
<b>Command Modes</b>	Perle(config) #interface ethernet 1 Perle(config-if)#

### Usage Guidelines

Use this command to configure the interface type and number.

### Examples

This example enter sub-menu configuration for Ethernet interface 1.

```
Perle(config)#interface ethernet 1
```



**Related Commands***(config-if)#bvi**(config-if)#openvpn-tunnel**(config-if)#tunnel(config-if)#dialer***(config-if)#bvi**

```

{arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-
ignore | enable-proxy-arp | timeout <1-2147483> |
description <LINE> |
ip [address <A.B.C.D> <A.B.C.D>] | [ddns service dyndns login <WORD>
password <WORD> | host <WORD> | host-group <WORD> | use-web skip
<WORD> | url <WORD>] | [dhcp client class-id <LINE> | auto | client-id
ethernet <1-2> | ascii <WORD> | auto | hex <Hex-String> | hostname <WORD>] |
[dhcp-relay] | [dns dhcp] | [firewall in | local | out <WORD>] | [health-profile
<WORD> nexthop [<A.B.C.D>] | [ospf authentication message-digest | null |
authentication-key 0 <WORD> | 7 <WORD> | <WORD>] | [cost <1-65535> |
[dead-interval <1-65535>] | [hello-interval <1-65535>] | [message-digest-key <1-
255> md5 0 <WORD> | 7 <WORD> | <WORD>] | [mtu-ignore] | [network
broadcast | non-broadcast | point-to-multipoint point-to-point] | [priority <0-
255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [policy
route-policy <WORD>] | [rip authentication key-chain <WORD> | mode md5 |
text string 0 <WORD> | 7 <WORD> | <WORD> | split-horizon disable | poison-
reverse] |
ipsec restrict |
ipv6 [address <X:X:X:X::X/<0-128> eui-64 | dhcp] | [enable] | [firewall in | out |
local <WORD>] | [nd dad attempts <0-600> | managed config-flag | other-config-
flag | prefix <X:X:X:X::X/<0-128> <0-4294967294> | no-autoconfig | no-onlink |
infinite] | [ra dns server <X:X:X:X::X>] | [hop-limit <1-255> | unspecified |
interval <4-1800> <3-1350>] | [lifetime <0> <4-9000>] | [suppress] | [reachable
time <0-3600000>] | [retransmission-time <0-3600000>] | [router-preference
high | low | medium] | [ospf cost <1-65535> | [dead-interval <1-65535>] | [hello-
interval <1-65535>] | [ifmtu] | [instance-id <0-255>] | [mtu-ignore] | [passive] |
[priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-
65535>] | [policy route-policy <WORD>] | [rip enable | split-horizon | disable
poisoned-reverse] |
logging event interface-ip | link-status |
mac access-group <WORD> deny | disable | permit |
mtu <68-1500> |
ntp [broadcast client | destination <A.B.C.D>] | [key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] | [disable] | [multicast [<A.B.C.D> | <X:X:X:X::X>] | client
<A.B.C.D> | <X:X:X:X::X>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-
4>] |
role lan | trusted | wan |
service-policy in <WORD> | out <WORD> |

```

shutdown |  
 snmp trap interface-ip | link-status |  
 zone-member security <WORD>}

Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description**

(config-if)#bvi

{arp disable-arp-filter |  
 enable-arp-accept | enable-  
 arp-announce | enable-arp-  
 ignore | enable-proxy-arp |  
 timeout <1-2147483> |

Configure ARP parameters.

**Disable ARP filter**—If enabled the IOLAN responds to same ARP requests coming from multiple interfaces.

**Enable ARP Accept**—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table:

- 0—don't create new entries in the ARP table
- 1—create new entries in the ARP table

**Enable ARP Announce**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface.

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface.

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**ARP Timeout**—If an ARP entry is not used for a specific amount of time the entry is removed from the caching table.

---

description <LINE> |

Configure interface description.

```

ip [address <A.B.C.D>
<A.B.C.D>] | [ddns service
dyndns login <WORD>
password <WORD> | host |
host-group <WORD> | use-
web skip <WORD> | url
<WORD>] | [dhcp client class-
id <LINE> | auto | client-id
ethernet <1-2> | ascii <WORD>
| auto | hex <Hex-String> |
hostname <WORD>] | [dhcp-
relay] | [dns dhcp] | [firewall in
| local | out <WORD>] |
[health-profile <WORD>]
nexthop [<A.B.C.D>] | [ospf
authentication message-digest
| null | authentication-key 0
<WORD> | 7 <WORD> |
<WORD>] | [cost <1-65535> |
[dead-interval <1-65535>] |
[hello-interval <1-65535>] |
[message-digest-key <1-255>
md5 0 <WORD> | 7 <WORD> |
<WORD>] | [mtu-ignore] |
[network broadcast | non-
broadcast | point-to-multipoint
point-to-point] | [priority <0-
255>] | [retransmit-interval
<1-65535>] | [transmit-delay
<1-65535>] | [policy route-
policy <WORD>] | [rip
authentication key-chain
<WORD> | mode md5 | text
string 0 <WORD> | 7
<WORD> | <WORD> | split-
horizon disable | poison-
reverse] |

```

Configure IP parameters.

**IP address/IP mask**—Configure the IP address/mask of this interface.

**DHCP**—your address is assigned from a DHCP server.

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dyndns server.

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service.

**skip**—skip everything before this on the given URL.

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the IOLAN to be seen on the Internet as a public address.

**DHCP client** —

**Class ID:**

- Auto
- Line

Specify a Class-id string, truncated to 200 characters. This same string or text will be configured on the server side and associated with an address to give the client.

**Client ID:**

This can be configured to be the Ethernet interface number, ASCII text, Hex string or set to Auto.

option—60—Vendor class

identifier<oem-name>:<model>:<serial#>  
in ASCII

**Hostname:**

Specify a value for hostname option.

**DHCP-relay**—set DHCP-relay for this interface.

**DNS dhcp**—use DNS servers received from DHCP server for specified interface

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**health-profile**—use this health profile for this interface, configure a nexthop interface.

**OSPF—  
authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0 to 16777214

Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

Default is 10 seconds

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication

- 0-unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).  
The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this

---

command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network—Configure the network type**

- **broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities
- **point-to-multipoint**— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all
- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts

**priority**—a router with a high priority will always win the DR/BDR election process.

Priority Range is 0-255

Default is 1

**retransmit-interval**—Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.

Range is 1–65535

Default is 5 seconds

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface.

---

Link state advertisements in the update packet have their age incremented by this amount before transmission.

Range is 1–65535

Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received.

Default is enabled

---

**ipsec restrict** |

Restricts IPsec on this interface.

```

ipv6 [address
<X:X:X:X::X/<0-128> eui-64 |
dhcp] | [enable] | [firewall in |
out | local <WORD>] | [nd dad
attempts <0-600> | managed
config-flag | other-config-flag |
prefix <X:X:X:X::X/<0-128>
```

```

<0-4294967294> | infinite] no-
autoconfig | no-onlink ] | ra
dns server <X:X:X:X::X> |
hop-limit <1-255> |
unspecified | interval <4-1800>
<3-1350> | lifetime <0> <4-
```

```

9000> | suppress | reachable
time <0-3600000> |
retransmission-time <0-
```

```

3600000> | [router-preference
high | low | medium] ospf cost
<1-65535> | [dead-interval <1-
```

```

65535>] | [hello-interval <1-
```

```

65535>] | [ifmtu] | instance-id
<0-255>] | [mtu-ignore ] |
[passive] | priority <0-255> |
[retransmit-interval <1-
```

```

65535>] | [transmit-delay <1-
```

```

65535>] | [policy route-policy
<WORD>] | [rip enable | split-
horizon | disable poisoned-
reverse ]
```

Configure IPv6 parameters.

**IPv6 address/eui-64 or DHCP**—configure the IPv6 address and prefix length or obtain an IPv6 address using DHCP

**enable**—enable IPv6 on this interface.

**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**nd**—IPv6 Interface Neighbor Discovery sub-commands

- **dad** (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (**dad\_attempts**) to be sent before this address can be configured. Range 1–600  
Default is 1
- **managed config flags**—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)
- **other-config-flags**—specify whether hosts use the administrated protocol for non-address auto-configuration information. Default is disabled (hosts use stateless auto-configuration of non-address information)

- **prefix**—specifies the IPv6 prefix advertised on the interface  
Configure the prefix length.  
Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.  
Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.  
Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.  
Range is 1–255  
Default is 64

**interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.  
Range of minimum is 3 to  $*0.75 \text{ max}$  (dynamic range)  
Default maximum 600 seconds, minimum is  $0.33*\text{max}$   
Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list. The router lifetime applies only to the router's usefulness as a default router; it does not apply to information contained in other message fields or options.  
Range is 4-1800 seconds  
Minimum interval is 3-1350 in seconds  
Default is 1800 seconds  
0 = not a default route



---

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE). Range 0–3600000 in milliseconds  
Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**policy route-policy**—enable this policy route for this interface.

Range is 0 to 16777214

Default is none

Default is 40 seconds

with the MTU value set on the interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received.

Default is enabled

**OSPF—**

**authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0 to 16777214

Default is none

---

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead). As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**ifmtu**—The range is dynamic (depending on the interface type) and it will match.

**instance-id**—instance ID for this interface.

Values are 0–255

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**passive**—no adjacency will be formed on this interface.

**priority**—A router with a high priority will always win the DR/BDR election process.

Priority Range is 0-255

Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.

Range is 1–65535

Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission.

Range is 1–65535

Default is 1 seconds

<b>logging event interface-ip   link-status  </b>	Configure interface logging events and link status.
<b>mac access-group &lt;WORD&gt; deny   disable   permit  </b>	Configure mac access-group parameters for this interface.
<b>mtu &lt;68-1500&gt;  </b>	Configure maximum transmission unit (MTU). Values are 68-1500 bytes Default is 1500 bytes
<b>ntp [broadcast client   destination &lt;A.B.C.D&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]  </b>	<p>Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network.</p> <p>The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.</p> <p>Configure Network Time Protocol (NTP) for this interface.</p> <p><b>broadcast client</b>—listens to NTP broadcasts</p> <p><b>destination broadcast</b>—Configure broadcast destination address</p> <p><b>multicast client</b>—listens to NTP multicasts</p> <p><b>destination multicast</b>—multicast IPv4 or IPv6 address</p> <p><b>key</b>—Configure broadcast authentication key</p> <p><b>versions</b> 1 to 4 are supported.</p> <p><b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17m, 4s), 11 (34m,8s) Default is 6</p>
<b>role lan   trusted   wan  </b>	<p>Select the role for this interface.</p> <p><b>LAN</b>—management access is from the LAN side</p> <p><b>WAN</b>—management access is from the WAN side</p> <p><b>Trusted</b>—management access from either the LAN or WAN side</p>

<b>service-policy in</b> <WORD>   <b>out</b> <WORD>	Assigns interface service policy. Configure for the policy for inbound or outbound traffic.
<b>shutdown</b>	Shutdown this interface.
<b>snmp trap interface-ip</b>   <b>link-</b> <b>status</b>	Configure interface SNMP traps and link status.
<b>zone-member security</b> <WORD> }	Configure this interface as a member of this zone security.
<b>Command Modes</b>	(config-if)#

### Usage Guidelines

Use this command to configure parameters for the bridge interface.

### Examples

This example enables an IP address on bvi 10.

```
>enable
#config
#interface bvi 10
(config-if)#ip address 172.16.113.45 255.255.0.0
```

### Related Commands

*(config-if)#openvpn-tunnel*  
*(config-if)#tunnel*  
*(config-if)#ethernet*  
*(config-if)#dialer*

## (config-if)#cellular

```
{alarm profile <WORD> |
description <LINE> |
idle-time <LINE> |
ip [ddns service dyndns login <WORD> password <WORD> host <WORD> |
host-group <WORD> | use-web skip
on-demand |
start-connected |
service-policy in <WORD> | out <WORD> |
snmp trap interface-ip | link-status | start-connected |
zone-member security <WORD> }
```

Use the no form of this command to negate a command or set to defaults.

### Syntax Description (config-if)#cellular

{**alarm profile** <WORD> | Use this alarm profile for this interface.

---

<b>description</b> <LINE>	Configure interface description.
<b>idle-time</b> <LINE>	Configure time to drop the "on demand" connection.
	Configure IP parameters.
	<b>DDNS</b> —
	<b>Service</b> —use dyndns
	login/password—configure the login id and password for the dnydns server.
	<b>Host/host-group</b> —Hostname/list of hostnames registered with the DDNS service.
	<b>skip</b> —skip everything before this on the given URL.
	<b>DHCP-relay</b> —set DHCP-relay for this interface.
	<b>DNS dhcp</b> —use DNS servers received from DHCP server for specified interface.
	<b>Firewall</b> —set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

Configure IP parameters.

**DDNS—**

**Service**—use dyndns

**login/password**—configure the login id and password for the dnydns server.

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service.

**skip**—skip everything before this on the given URL.

**DHCP-relay**—set DHCP-relay for this interface.

**DNS dhcp**—use DNS servers received from DHCP server for specified interface.

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**health-profile**—use this health profile for this interface, configure a nexthop interface.

**OSPF—**

**authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214. Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network. Default is 4 times the hello interval. Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface. The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key

- **md5**—Identifies the key (password) used between this router and neighboring routers for MD5 authentication

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—**Configure the network type**

- **broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities
- **point-to-multipoint**— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all
- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts

**priority**—a router with a high priority will always win the DR/BDR election process.  
Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second  
Default is 1 seconds

---

	<p><b>transmit-delay</b>—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission. Range is 1–65535</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled</p>
<p><b>ipsec restrict</b>  </p>	<p>Restrict IPsec on this interface.</p>
	<p>Configure IPv6 parameters.</p> <p><b>auto-config</b>—obtains an address using autoconfiguration</p> <p><b>enable</b>—enable IPv6 on this interface</p> <p><b>firewall</b>—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.</p> <p><b>OSPF</b>—</p> <p><b>cost</b>—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0–16777214 Default is none</p> <p><b>dead-interval</b>—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network. Default is 4 times the hello interval Default is 40 seconds</p> <p><b>hello interval</b>—Configure the hello packet time interval for hello packets sent on an interface. The default is 10 seconds.</p> <p><b>ifmtu</b>—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.</p> <p><b>instance-id</b>—instance ID for this interface. Values are 0–255</p>

---



**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**passive**—no adjacency will be formed on this interface.

**priority**—A router with a high priority will always win the DR/BDR election process. Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission.  
Range is 1–65535  
Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received.  
Default is enabled

---

**logging event interface-ip | link-status |**

Configure interface logging events and link status.

---

**monitor-traffic both | receive | transmit |**

Monitors the traffic for on demand feature. Traffic can be monitored for:

- in
- out
- both

<b>mtu</b> <64-9000>	Sets Maximum Transmission Unit. (MTU). Values are 64-9000 bytes Default is 1460 bytes
<b>ntp</b> [ <b>broadcast client</b>   <b>destination</b> <A.B.C.D>]   [ <b>key</b> <1-65534>]   [ <b>minpoll</b> <4-17>]   [ <b>version</b> <1-4>]   [ <b>disable</b> ]   [ <b>multicast</b> [<A.B.C.D>   <X:X:X:X::X>]   <b>client</b> <A.B.C.D>   <X:X:X:X::X>]   [ <b>key</b> <1-65534>]   [ <b>minpoll</b> <4-17>]   [ <b>version</b> <1-4>]	Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOAN's etc). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the .  Configure Network Time Protocol (NTP) for this interface.  <b>broadcast client</b> —listens to NTP broadcasts. <b>destination broadcast</b> —Configure broadcast destination address. <b>multicast client</b> —listens to NTP multicasts. <b>destination multicast</b> —multicast IPv4 or IPv6 address. <b>key</b> —Configure broadcast authentication key. <b>versions</b> 1 to 4 are support. <b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s). Default is 6
<b>on-demand</b>	On demand feature brings up the interface when there is data to be sent or received only.
<b>service-policy in</b> <WORD>   <b>out</b> <WORD>	Assigns traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
	Sets interface SNMP traps and link status.
<b>start-connected</b>	Establishes LTE data connection after reload or power up.
<b>zone-member security</b> <WORD> }	This interface is a member of this zone security.
<b>Command Modes</b>	PerleRouter(config-if)#

### Usage Guidelines

Use this command to configure cellular profile parameters.

---

## Examples

This example starts cellular connection after the router reboots.

```
PerleRouter(config)# interface cellular 0
PerleRouter(config-if)#start-connected
```

---

## Related Commands

### (config-if)#dialer

```
{default-route auto | none | force |
description <LINE> |
encapsulation ppp |
ip [address <A.B.C.D> <A.B.C.D>] | [ddns service dyndns login <WORD>
password <WORD> | host <WORD> | host-group <WORD> | use-web skip
<WORD> | url <WORD>] | [dhcp-relay] | [firewall in | out | local <WORD>] |
[health-profile <WORD> nexthop <A.B.C.D>] | [ospf authentication message-
digest | null | authentication-key 0 <WORD> | 7 <WORD> | <WORD>] | [cost <1-
65535>] | [dead-interval <1-65535>] | [hello-interval <1-65535>] | [message-
digest-key <1-255> md5 0 <WORD> | 7 <WORD> | <WORD>] | [mtu-ignore |
network broadcast | non-broadcast | point-to-point | point-to-multipoint] |
[priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-
65535>] | [policy route-policy <WORD>] | [rip authentication key-chain
<WORD> | mode md5 | text string 0 <WORD> | 7 <WORD> | <WORD>] | split-
horizon disable | poison-reverse] |
ipsec restrict |
ipv6 [address autoconfig] | [enable] | [firewall in | out | local <WORD>] | [ospf
[cost <1-65535>] | [dead-interval <1-65535>] | [hello-interval <1-65535>] | ifmtu |
[instance-id] | [mtu-ignore] | [priority <0-255>] | [retransmit-interval <1-65535>]
| [transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip enable | split-
horizon | disable poisoned-reverse] |
logging event interface-ip | link-status] |
mtu <64-1500> |
ntp [broadcast client | destination <A.B.C.D>] | [key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] | [disable] | [multicast [<A.B.C.D> | <X:X:X:X::X>] | client
<A.B.C.D> | <X:X:X:X::X>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-
4>] |
ppp access-concentrator <LINE> | chap hostname <WORD> | password 0
<LINE> | 7 <LINE> | <LINE> | timeout idle <1-4294967> |
role lan | trusted | wan |
service-policy in <WORD> | out <WORD> |
shutdown |
snmp trap interface-ip | link-status |
```

---

**zone-member security** <WORD>}

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>(config-if)#dialer</b>	
{ <b>default-route auto</b>   <b>none</b>   <b>force</b>	Default-route—enable/disable default route to peer. <ul style="list-style-type: none"> <li>• auto—install default route when link comes up</li> <li>• none—don't install default route when link comes up</li> </ul>
<b>description</b> <LINE>	Configure interface name.
<b>encapsulation ppp</b>	Sets encapsulation type.

```

ip [address <A.B.C.D>
<A.B.C.D>] | [ddns service
dyndns login <WORD>
password <WORD> | host
<WORD> | host-group
<WORD> | use-web skip
<WORD> | url <WORD>] |
[dhcp-relay] | [firewall in | out
| local <WORD>] | [health-
profile <WORD> nexthop
<A.B.C.D>] | [ospf
authentication message-digest
| null | authentication-key 0
<WORD> | 7 <WORD> |
<WORD>] | [cost <1-65535>] |
[dead-interval <1-65535>] |
[hello-interval <1-65535>] |
[message-digest-key <1-255>
md5 0 <WORD> | 7 <WORD> |
<WORD>] | [mtu-ignore |
network broadcast | non-
broadcast | point-to-point |
point-to-multipoint] |
[priority<0-255>] |
[retransmit-interval <1-
65535>] | [transmit-delay <1-
65535>] | [policy route-policy
<WORD>] | [rip
authentication key-chain
<WORD> | mode md5 | text
string 0 <WORD> | 7
<WORD> | <WORD> | split-
horizon disable | poison-
reverse] |

```

Configure IP parameters.

**IP address/IP mask**—Configure the IP address/mask of this interface.

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dnydns server.

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service.

**skip**—skip everything before this on the given URL.

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the IOLAN to be seen on the Internet as a public address.

**DHCP-relay**—set DHCP-relay for this interface.

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic

**health-profile**—use this health profile for this interface, configure a nexthop interface.

**OSPF**—

**authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into

---

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval  
Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication.

- 0-unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).

The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—Configure the network type

- broadcast—a designated router and backup designated router are elected using OSPF multicasting capabilities
- point-to-multipoint— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required.

---

Routers on an interface becoming neighbors should match the network

- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts

**priority**—a router with a high priority will always win the DR/BDR election process. Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission.  
Range is 1–65535  
Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received.  
Default is enabled

---

**ipsec restrict** |

Restrict IPsec on this interface.

```

ipv6 [address autoconfig] |
[enable] | [firewall in | out |
local <WORD>] | [ospf [cost
<1-65535>] | [dead-interval
<1-65535>] | [hello-interval
<1-65535>] | ifmtu | [instance-
id] | [mtu-ignore] | [priority <0-
255>] | [retransmit-interval
<1-65535>] | [transmit-delay
<1-65535>] | [policy route-
policy <WORD>] | [rip enable |
split-horizon disable |
poisoned-reverse] |

```

Configure IPv6 parameters.

**auto-config**—obtains an address using autoconfiguration.

**enable**—enable IPv6 on this interface

**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**OSPF**—

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0–16777214

Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**ifmtu**—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.

**instance-id**—instance ID for this interface. Values are 0–255

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**passive**—no adjacency will be formed on this interface.

**priority**—A router with a high priority will always win the DR/BDR election process.

Priority Range is 0-255

Default is 1



	<p><b>retransmit-interval</b>—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network. Range is 1–65535 Default is 5 second</p> <p><b>transmit-delay</b>—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission. Range is 1–65535</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received Default is enabled</p>
<b>logging event interface-ip   link-status  </b>	Configure interface logging events and link status.
<b>mtu &lt;64-1500&gt;  </b>	Sets Maximum Transmission Unit (MTU). Values are 64-1500 bytes Default is 1492
<b>ntp [broadcast client   destination &lt;A.B.C.D&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]  </b>	<p>Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOAN's etc). You can run the SNTP client and the NTP server concurrently on your system.</p> <p>Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.</p> <p>Configure Network Time Protocol (NTP) for this interface.</p>

	<p><b>broadcast client</b>—listens to NTP broadcasts.</p> <p><b>destination broadcast</b>—Configure broadcast destination address.</p> <p><b>multicast client</b>—listens to NTP multicasts.</p> <p><b>destination multicast</b>—multicast IPv4 or IPv6 address.</p> <p><b>key</b>—Configure broadcast authentication key.</p> <p><b>versions</b> 1 to 4 are support.</p> <p><b>minimum poll interval</b> is 4(16s), 5(32 s), 6(1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s) Default is 6</p>
<p><b>ppp access-concentrator</b>  <code>&lt;LINE&gt;   chap hostname</code>  <code>&lt;WORD&gt;   password 0</code>  <code>&lt;LINE&gt;   7 &lt;LINE&gt;   &lt;LINE&gt;</code>  <code>  timeout idle &lt;1-4294967&gt;  </code></p>	Configure Point to Point protocol parameters.
<p><b>role lan   trusted   wan  </b></p>	<p>Select the role for this interface.</p> <p><b>LAN</b>—management access is from the LAN side</p> <p><b>WAN</b>—management access is from the WAN side</p> <p><b>Trusted</b>—management access from either the LAN or WAN side</p>
<p><b>service-policy in &lt;WORD&gt;  </b>  <b>out &lt;WORD&gt;  </b></p>	Assigns a traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
<p><b>shutdown  </b></p>	Shut down this interface.
<p><b>snmp trap interface-ip   link-</b>  <b>status</b></p>	Configure for SNMP traps for interface and link status.
<p><b>zone-member security</b>  <code>&lt;WORD&gt;}</code></p>	This interface is a member of this zone security.

---

### Command Modes

(config-if)#

---

### Usage Guidelines

Sets parameters for dialer interface.

**Examples**

This example sets the role for this interface to WAN.  
 (config-if)role wan

**Related Commands**

*(config-if)#bvi*  
*(config-if)#dialer*  
*(config-if)#tunnel*  
*(config-if)#openvpn-tunnel*

**(config-if)#dot11radio**

```
{arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-
ignore | enable-proxy-arp |
bridge-group <1-9999> |
channel <1-11> |
dot11ac [antenna-pattern-fixed] | [center-channel-frequency <34-173>] |
[channel-width vht40 | vht80] | [ldpc] | [max-mpdu <11454> <7991>] | [max-
mpdu-exp <1-7>] | [require-vht] | [short-gi <20 | 40 | 80>] | [stbc rx-stbc rx-stbc-
1 | tx-stbc] |
dot11n [40mhz-incapable] | [a-msdu <7935>] | [auto-power-save] | [channel-
width ht40+ | ht40-] | [dsss-cck-40mhz] | [ldpc] | [require-ht] | [short-gi <20 |
40>] | [stbc rx-stbc rx-stbc-1 | tx-stbc] |
ip [address <A.B.C.D> <A.B.C.D>] | dhcp] | [ddns service dyndns login <WORD>
password <WORD> host <WORD> host-group <WORD> | use-web skip
<WORD> | url <WORD>] | [dhcp client class-id <LINE> | auto | client-id
ethernet <1-12418> | ascii <WORD> | auto | hex <Hex-String> | hostname
<WORD>] | [dhcp-relay] | [dns dhcp] | [firewall in | out | local <WORD>] |
[health-profile <WORD> nexthop <A.B.C.D>] | [ospf authentication message-
digest | null] | [authentication-key 0 <WORD> | 7 <WORD> | <WORD>] | [cost
<1-65535>] | [dead-interval <1-65535>] | [hello-interval <1-65535>] | [message-
digest-key <1-255> md5 0 <WORD> | 7 <WORD> | <WORD>] | [mtu-ignore] |
[network broadcast | non-broadcast | point-to-point | point-to-multipoint] |
[priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-
65535>] | [policy route-policy <WORD>] | [rip authentication key-chain
<WORD> | mode md5 | text string 0 <WORD> | 7 <WORD> | <WORD> | split-
horizon disable | poison-reverse] |
ipsec restrict |
ipv6 [address dhcp] | [enable] | [firewall in | out | local <WORD>] | [nd dad
attempts <0-600> | managed config-flag | other-config-flag | prefix
<X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-autoconfig | no-onlink] | [ra
dns server <X:X:X:X::X> | [hop-limit <1-255> | unspecified | interval <4-1800>
<3-1350>] | [lifetime <0><4-9000>] | [suppress] | [reachable time <0-3600000>] |
[retransmission-time <0-3600000>] | [router-preference high | low | medium] |
```



---

**{ arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-ignore | enable-proxy-arp |**

Configure ARP parameters.

**Disable ARP filter**—If enabled the responds to same ARP requests coming from multiple interfaces.

**Enable ARP Accept**—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table: 0—don't create new entries in the ARP table 1—create new entries in the ARP table.

**Enable ARP Announce**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface.

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface.

- 0—(default) Use any local address, configured on any interface

- 1—Try to avoid local addresses that are not in the target's subnet for this interface

- **Enable Proxy ARP**—Enable Proxy ARP if you need your to respond to local networks with its MAC address. Default is Disabled

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface.

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**Enable Proxy ARP**—Enable Proxy ARP if you need your to respond to local networks with its MAC address. Default is Disabled

---

**bridge-group <1-9999> |**

Sets transparent bridging interface parameters.

---

**channel <1-11> |**

Sets the radio frequency.

---

<b>description</b> <LINE>	Description for this interface.
	Configure dot11ac vht mode.
	Configure dot11n ht mode.

---

&lt;1-2&gt;

Configure IP parameters.

**IP address/IP mask**—Configure the IP address/mask of this interface.

**DHCP**—your address is assigned from a DHCP server.

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dnydns server.

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service.

**skip**—skip everything before this on the given URL.

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the to be seen on the Internet as a public address.

**DHCP client**—

**Class ID:**

- Auto
- Line

Specify a Hex string or ASCII text. This same hex string or text would be configured on the server side and associated with an address to give the client.

**Client ID:**

This can be configured to be the Ethernet interface number, ASCII text, Hex string or set to Auto.

option—60—Vendor class identifier<oem-name>:<model>:<serial#> in ASCII

**Hostname:**

Specify a value for hostname option.

**DHCP-relay**—set DHCP-relay for this interface.

**DNS dhcp**—use DNS servers received from DHCP server for specified interface

**Firewall**—set firewall for inbound, traffic destined for this or outbound traffic.

**health-profile**—use this health profile for this interface, configure a nexthop interface.

**skip**—skip everything before this on the given URL

---

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the to be seen on the Internet as a public address.

**OSPF—**

**authentication/authentication-key**—enables message-digest authentication, text, or null.  
Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214  
Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.  
Default is 4 times the hello interval  
Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.  
The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication

- 0-unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).  
The default is none



---

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—Configure the network type

- **broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities point-to-multipoint— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all
- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts

**priority**—a router with a high priority will always win the DR/BDR election process. Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission.

	<p>Range is 1–65535 Default is 1 seconds</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled</p>
<b>ipsec restrict</b>	Restrict IPsec on this interface.
<b>[enable]</b>	<p>Configure IPv6 parameters.</p> <p><b>address</b>—use DHCP to obtain address.</p> <p><b>enable</b>—enable IPv6 on this interface.</p> <p><b>firewall</b>—set firewall for inbound, traffic destined for this or outbound traffic.</p> <p><b>nd</b>—IPv6 Interface Neighbor Discovery sub-commands</p> <ul style="list-style-type: none"> <li>• <b>dad</b> (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (<b>dad_attempts</b>) to be sent before this address can be configured Range 1–600 Default is 1</li> <li>• <b>managed config flags</b>—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)</li> <li>• <b>other-config-flags</b>—specify whether hosts use the administrated protocol for non-address auto-configuration information. Default is disabled (hosts use stateless auto-configuration of no-address information)</li> <li>• <b>prefix</b>—specifies the IPv6 prefix advertised on the interface Configure the prefix length. Range is 0–128</li> </ul>

---

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.  
Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.  
Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.

Range of minimum is 3 to  $*0.75 \text{ max}$  (dynamic range)

Default maximum 600 seconds, minimum is  $0.33 * \text{max}$

Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list. The router lifetime applies only to the router's usefulness as a default router; it does not apply to information contained in other message fields or options.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

---

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**OSPF**—

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead).

As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**ifmtu**—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.

**instance-id**—instance ID for this interface. Values are 0–255

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**passive**—no adjacency will be formed on this interface.

	<p><b>priority</b>—A router with a high priority will always win the DR/BDR election process. Priority Range is 0-255 Default is 1</p> <p><b>retransmit-interval</b>—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network. Range is 1–65535 Default is 5 second</p> <p><b>transmit-delay</b>—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission. Range is 1–65535 Default is 1 seconds</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled</p>
<b>logging event interface-ip   link-status  </b>	Configure interface logging events and link status.
<b>mtu &lt;256-1500&gt;  </b>	Configure Maximum Transmission Unit (MTU) size. Values are 256-1500 bytes Default is 1500 bytes
<b>ntp [broadcast client   destination &lt;A.B.C.D&gt;   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]  </b>	Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the .

	<p>Configure Network Time Protocol (NTP) for this interface.</p> <p><b>broadcast client</b>—listens to NTP broadcasts.</p> <p><b>destination broadcast</b>—Configure broadcast destination address.</p> <p><b>multicast client</b>—listens to NTP multicasts.</p> <p><b>destination multicast</b>—multicast IPv4 or IPv6 address.</p> <p><b>key</b>—Configure broadcast authentication key.</p> <p><b>versions</b> 1 to 4 are support.</p> <p><b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s) Default is 6</p>
<b>radio-mode</b> <0-1>	Select 0 for 2.4Ghz and 1 for 5Ghz. Default is 2.4Ghz
<b>role lan</b>   <b>trusted</b>   <b>wan</b>	Select the role for this interface. <b>LAN</b> —management access is from the LAN side
	<b>WAN</b> —management access is from the WAN side <b>Trusted</b> —management access from either the LAN or WAN side
	Assign traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
<b>shutdown</b>	Shutdown this interface.
<b>interface-ip</b>	Configure SNMP traps for interface and link status.
	Configure radio service set parameters.
<b>station-role non-root</b>   <b>root</b>	Configure role of the radio.
	Configure an ISO 3166-1 Alpha-2 code. Two characters. Default is ac (United States)
	This interface is a member of this zone security.
<b>Command Modes</b>	PerleRouter(config-if)#

---

**Usage Guidelines**

Setup options for Dot11Radio.

---

**Examples**

This example sets up this interface to use DHCP.

```
PerleRouter(config-if)# ip address dhcp
```

---

**Related Commands****(config-if)#ethernet**

```

{alarm profile <WORD> |
arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-
ignore | enable-proxy-arp | timeout <1-2147483> |
authentication [host-mode | multi-auth | multi-host | single-host] | [periodic] |
[port-control auto | forced-authorized | force-unauthorized] | [timer
reauthenticate <1-65535> | restart <1-65535>] |
bridge-group <1-9999> |
description <LINE> |
dot1x [credential <WORD>] | [max-auth-req <1-10>] | [max-req <1-10>] | [pae
authenticator | supplicant] | [supplicant eap profile <WORD>] | [timeout quiet-
period <1-65535> | supp-period <1-65535> | tx-period <1-65535>] |
duplex auto | half | full |
ip address [<A.B.C.D> <A.B.C.D> | dhcp] | [ddns service dyndns | use-web skip
<WORD> | url <WORD>] | [dhcp client class-id <LINE> | auto | client-id
ethernet <1-2> | acsii <WORD> | auto | hex <HEX-STRING> | hostname
<WORD>] | [dhcp-relay] | [dns dhcp] | [firewall in | local | out <WORD>] |
[health-profile <WORD> nexthop <A.B.C.D>] | [ospf authentication message-
digest | null | authentication-key 0 <WORD> | 7 <WORD> | <WORD> | [cost <1-
65535>] | [ ead-interval <1-65535>] | [hello-interval <1-65535>] | [message-
digest-key <1-255> md5 0 <WORD> | 7 <WORD> | <WORD>] | [mtu-ignore |
network broadcast | non-broadcast | point-to-point | point-to-multipoint] |
[priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-
65535>] | [policy route-policy <WORD>] | [rip authentication key-chain
<WORD> | mode md5 | text string 0 <WORD> | 7 <WORD> | <WORD> | split-
horizon disable | poison-reverse]
ipsec restrict |
ipv6 [address <X:X:X:X::X/<0-128> | autoconfig | dhcp] [enable] | [firewall in |
out | local <WORD>] | [nd dad attempt <0-500> | managed config-flag | other-
config-flag | prefix <X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-
autoconfig | no-onlink] | [ra dns server <X:X:X:X::X>] | [hop-limit <1-255> |
unspecified] | [interval <4-1800> <3-1350> | [lifetime <0> | <4-9000>] | [suppress] |
[reachable time <0-3600000>] | [retransmission-time <0-3600000>] | [router-

```

**preference** **high** | **low** | **medium**] | [**ospf cost** <1-65535> | **dead-interval** <1-65535> | **hello-interval** <1-65535> | **ifmtu** | **instance-id** <0-255> | **mtu-ignore** | **passive** | **priority** <0-255> | **retransmit-interval** <1-65535> | **transmit-delay** <1-65535> | [**policy route-policy** <WORD>] | [**rip enable** | **split-horizon** | **disable poisoned-reverse**] |  
**lldp max-neighbors** <1-50> | **receive** | **ttl-select mac-phy-cfg** | **management-address** | **max-frame-size** | **port-description** | **system -capabilities** | **system-description** | **system-name** | **transmit** |  
**logging event interface-ip** | **link-status** |  
**mab eap** |  
**mac access-group** <word> **deny** | **disable** | **permit** |  
**mtu** <64-9000> |  
**ntp** [**broadcast client** | **destination** <A.B.C.D>] | [**key** <1-65534>] | [**minpoll** <4-17>] | [**version** <1-4>] | [**disable**] | [**multicast** [<A.B.C.D> | <X:X:X:X::X> | **client** <A.B.C.D> | <X:X:X:X::X>] | [**key** <1-65534>] | [**minpoll** <4-17>] | [**version** <1-4>] |  
**power efficient-ethernet auto** |  
**role lan** | **trusted** | **wan** |  
**service-policy in** | **out** |  
**shutdown** |  
**snmp trap interface-ip** | **link-status** |  
**spanning-tree** [**bpdufilter enable** | **disable**] | [**bpduguard** [**disable** | **enable**] | [**cost** <1-200000000>] | [**guard loop** | **none** | **root** | **topology-change**] | [**link-type auto** | **point-to-point** | **shared**] | **mcheck** | [**mst cost** <1-200000000>] | [**port-priority** <0-240>] | [**portfast disable** | **edge** | **network**] |  
**speed** |  
**vrrp** <1-255> |  
**zone-member security** <WORD>}  
 Use the no form of this command to negate a command or set to defaults.

---

**Syntax Description**
**(config-if)ethernet#**


---

**{alarm profile** <WORD> |

Use this alarm profile for this interface.



---

```
arp disable-arp-filter | enable-
arp-accept | enable-arp-
announce | enable-arp-ignore |
enable-proxy-arp | timeout <1-
2147483> |
```

Configure ARP parameters.

**Disable ARP filter**—If enabled the IOLAN responds to same ARP requests coming from multiple interfaces.

**Enable ARP Accept**—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table:

0—don't create new entries in the ARP table

1—create new entries in the ARP table

**Enable ARP Announce**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

---

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**ARP Timeout**—If an ARP entry is not used for a specific amount of time the entry is removed from the caching table.

**Enable Proxy ARP**—Enable Proxy ARP if you need your IOLAN to respond to local networks with its MAC address. Default is Disabled

---

```

authentication [host-mode |
multi-auth | multi-host |
single-host] | [periodic] |
[port-control auto | forced-
authorized | force-
unauthorized] | [timer
reauthenticate <1-65535> |
restart <1-65535>] |

```

Selects authentication mode to use on this interface when using Dot1x devices.

### Host Mode

#### Single host

- Only one device can authenticate and connect on the port

This is the default mode of operation.

#### Multiple host

- Unlimited number of devices can connect on the port once a single device has been authenticated on the port. This single device must be a data (as opposed to voice) device

#### Multiple authentication

- Each device connecting to your IOLAN is required to authenticate.
- No limit as to the number of devices which can authenticate on the port

**periodic reauthentication**—When enabled, the supplicant will be asked to re-authenticated based on the Advanced setting -> re-authentication timeout value.

#### Port control

- Auto—the port is locked expecting authentication from either a connected 802.1X client or if MAB is enabled, it will authenticate the MAC to the RADIUS server.

- Force authorized—the port is unsecure/unlocked meaning normal operation where no 802.1X client or MAB authentication via RADIUS is required. This is the default setting.
- Force unauthorized – the port is secured/locked and will NEVER allow any traffic to ingress into our Ethernet port/s.

### Timer

**Maximum re-authentication retries**—Set the number of times the authenticator will attempt to re-authenticate a supplicant.

Range is 1-10 seconds

Default is 2 seconds

### Restart timeout—

Interval in seconds after which an attempt should be made to authenticate an unauthorized port. If the parameter “server” is specified, the time is derived from the “Session-Timeout value” (RADIUS Attribute 27).

Range is 1-65535 seconds

Default is 60 seconds

<b>bridge-group</b> <1-9999>	Adds this interface to the specified bridge-group.
<b>description</b> <LINE>	Description for this interface.
<b>dot1x</b> [credential <WORD>]   [max-auth-req <1-10>]   [max-req <1-10>]   [pae authenticator   supplicant]   [supplicant eap profile <WORD>]   [timeout quiet-	Sets the Port Access Entity (PAE) type. <b>Supplicant</b> —The interface acts only as a supplicant and does not respond to messages that are meant for an authenticator.
<b>period</b> <1-65535>   <b>supp-period</b> <1-65535>   <b>tx-period</b> <1-65535>	<b>Authenticator</b> —The interface acts only as an authenticator and does not respond to any messages meant for a supplicant. <b>Both</b> —The interface behaves both as a supplicant and as an authenticator and thus does respond to all dot1x messages.
<b>duplex</b> auto   half   full	Select duplex for this interface. In most cases this parameter should be left at auto.

```

ip address [<A.B.C.D>
<A.B.C.D> | dhcp] | [ddns
service dyndns | use-web skip
<WORD> | url <WORD>] |
[dhcp client class-id <LINE> |
auto | client-id ethernet <1-5> |
acsii <WORD> | auto | hex
<HEX-STRING | hostname
<WORD>] | [dhcp-relay] | [dns
dhcp] | [firewall in | local | out
<WORD>] | [health-profile
<WORD> nexthop <A.B.C.D>]
| [ospf authentication message-
digest | null | authentication-
key 0 <WORD> | 7 <WORD> |
<WORD>] | [cost <1-65535>] | [
ead-interval <1-65535>] | [
hello-interval <1-65535>] | [
message-digest-key <1-255>
md5 0 <WORD> | 7 <WORD> |
<WORD>] | [mtu-ignore |
network broadcast | non-
broadcast | point-to-point |
point-to-multipoint] | [priority
<0-255>] | [retransmit-interval
<1-65535>] | [transmit-delay
<1-65535>] | [policy route-
policy <WORD>] | [rip
authentication key-chain
<WORD> | mode md5 | text
string 0 <WORD> | 7
<WORD> | <WORD> | split-
horizon disable | poison-
reverse] |

```

Configure IP parameters.

**IP address/IP mask**—Configure the IP address/mask of this interface.

**DHCP**—your address is assigned from a DHCP server.

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dyndns server.

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service.

**skip**—skip everything before this on the given URL.

**Use-web URL**—Enter the URL that you want to obtain an IP address from.

This allows the IOLAN to be seen on the Internet as a public address.

**DHCP client** —

**Class ID:**

- Auto
- Line

Specify a Hex string or ASCII text. This same hex string or text would be configured on the server side and associated with an address to give the client.

**Client ID:**

This can be configured to be the Ethernet interface number, ASCII text, Hex string or set to Auto.

option—60—Vendor class

identifier<oem-

name>:<model>:<serial#> in ASCII

**Hostname:**

Specify a value for hostname option.

**DHCP-relay**—set DHCP-relay for this interface.

**DNS dhcp**—use DNS servers received from DHCP server for specified interface.

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

---

**health-profile**—use this health profile for this interface, configure a nexthop interface.

**OSPF**—

**authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>.

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0 to 16777214

Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

**authentication.**

- 0-unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).  
The default is none

---

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—**Configure the network type**  
**broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities  
**point-to-multipoint**— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required.

- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all.. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts

**priority**—a router with a high priority will always win the DR/BDR election process  
Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit**—**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface.

	<p>Link state advertisements in the update packet have their age incremented by this amount before transmission Range is 1–65535</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled Default is 1 seconds</p>
<p><b>ipsec restrict</b>  </p>	<p>Restrict IPsec on this interface.</p>
<p><b>ipv6</b> [address &lt;X:X:X:X::X/&lt;0-128&gt;   autoconfig   dhcp] [enable]   [firewall in   out   local &lt;WORD&gt;]   [nd dad attempt &lt;0-500&gt;   managed config-flag   other-config-flag   prefix &lt;X:X:X:X::X/&lt;0-128&gt; &lt;0-4294967294&gt;   infinite]   [ra dns server &lt;X:X:X:X::X&gt;]   [hop-limit &lt;1-255&gt;   unspecified]   [interval &lt;4-1800&gt; &lt;3-1350&gt;   lifetime &lt;0&gt;   &lt;4-9000&gt;]   [suppress]   [reachable time &lt;0-3600000&gt;]   [retransmission-time &lt;0-3600000&gt;]   [router-preference high   low   medium] [policy route-policy &lt;WORD&gt;]   [rip enable   split-horizon disable   poisoned-reverse]  </p>	<p>Configure IPv6 parameters.</p> <p><b>IPv6 address</b>—configure the IPv6 address eui-64, autoconfig, or dhcp.</p> <p><b>enable</b>—enable IPv6 on this interface.</p> <p><b>firewall</b>—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.</p> <p><b>nd</b>—IPv6 Interface Neighbor Discovery sub-commands.</p> <p>dad (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages.</p> <p>Use this command to specify the number of consecutive Neighbor Solicitation messages (dad_attempts) to be sent before this address can be configured Range 1–600 Default is 1</p> <ul style="list-style-type: none"> <li>• managed config flags—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)</li> <li>• other-config-flags—specify whether hosts use the administrated protocol for non-address auto-configuration information.</li> </ul>

---

Default is disabled (hosts use stateless auto-configuration of no-address information)

- **prefix**—specifies the IPv6 prefix advertised on the interface  
Configure the prefix length.  
Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.

Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.

Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.

Range of minimum is 3 to  $*0.75 \text{ max}$  (dynamic range)

Default maximum 600 seconds, minimum is  $0.33*\text{max}$

Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements



	<p><b>reachable time</b>—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation Default is 0 (unspecified by this router) Range is 0-360000 milliseconds</p>
	<p><b>router-preference</b>—set the default router preference. A High value means this will be preferred.</p> <ul style="list-style-type: none"> <li>• High</li> <li>• Medium</li> <li>• Low</li> </ul> <p>Default is medium</p> <p><b>transmit-delay</b>—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission Range is 1–65535 Default is 1 seconds</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received Default is enabled</p>
<p><b>lldp max-neighbors &lt;1-50&gt;   receive   tvl-select mac-phy-cfg   management-address   max-frame-size   port-description   system -capabilities   system-description   system-name   transmit  </b></p>	Configure LLDP parameters.
<p><b>logging event interface-ip   link-status  </b></p>	Configure logging events for interface and link status.
<p><b>mab eap  </b></p>	Sets MAC authentication bypass interface commands.
<p><b>mac access-group &lt;word&gt; deny   disable   permit  </b></p>	Sets interface MAC access-list parameters.

<b>mtu</b> <64-9000>	Sets maximum transmission unit (MTU). Values are 64 t 9000 bytes Default is 1500 bytes
<b>ntp</b> [broadcast client   destination <A.B.C.D>]   [key <1-65534>]   [minpoll <4-17>]   [version <1-4>]   [disable]   [multicast [<A.B.C.D>   <X:X:X:X::X>]   client <A.B.C.D>   <X:X:X:X::X>]   [key <1-65534>]   [minpoll <4-17>]   [version <1-4>]	Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN. Configure Network Time Protocol (NTP) for this interface. <b>broadcast client</b> —listens to NTP broadcasts. <b>destination broadcast</b> —Configure broadcast destination address. <b>multicast client</b> —listens to NTP multicasts. <b>destination multicast</b> —multicast IPv4 or IPv6 address. <b>key</b> —Configure broadcast authentication key. <b>versions</b> 1 to 4 are supported. <b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17m, 4s), 11 (34m,8s) Default is 6
<b>power efficient-ethernet auto</b>	Configure interface power settings.
<b>role lan</b>   trusted   wan	Select the role for this interface. <b>LAN</b> — management access is from the LAN side <b>WAN</b> —management access is from the WAN side <b>Trusted</b> —management access from either the LAN or WAN side
<b>service-policy in</b>   out	Assigns traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.

<b>shutdown</b>	Shutdown this interface.
<b>snmp trap interface-ip</b>   <b>link-status</b>	Configure SNMP traps for interface and link status.
<b>spanning-tree</b> [ <b>bpdufilter</b> <b>enable</b>   <b>disable</b> ]   [ <b>bpduguard</b> <b>[disable   enable]</b>   [ <b>cost</b> < <b>1-200000000</b> >]   [ <b>guard loop</b>   <b>none</b>   <b>root</b>   <b>topology-change</b> ]   [ <b>link-type</b> <b>auto</b>   <b>point-to-point</b>   <b>shared</b> ]   [ <b>mcheck</b>   [ <b>mst cost</b> < <b>1-200000000</b> >]   [ <b>port-priority</b> < <b>0-240</b> >]   [ <b>portfast</b> <b>disable</b>   <b>edge</b>   <b>network</b> ]	<p>Configure interface parameters for spanning tree.</p> <p><b>bpdufilter</b>—don't send or receive BPDUs on this interface. Default is Disabled</p> <p><b>bpduguard</b>—don't accept BPDUs on this interface. Default is Disabled</p> <p><b>cost</b>—change port path cost. Value is 1 to 200000000 Default is auto (defined by STP protocol)</p> <ul style="list-style-type: none"> <li>● loop</li> <li>● none</li> <li>● root</li> <li>● topology-change</li> </ul> <p><b>link-type</b></p> <ul style="list-style-type: none"> <li>● auto—this interface is point-to-point if configured for full duplex operation</li> <li>● point-to-point</li> <li>● shared</li> </ul> <p><b>mcheck</b>—force the mode from STP to RSTP/MSTP mode.</p> <p><b>mst</b>—change path cost and port priority for multiple spanning tree mode.</p> <p><b>port-priority</b>—change the port priority for an instance. (increments of 16) Default is 128</p> <p><b>portfast network</b>—this feature causes the to enter the STP forwarding-state immediately or upon a linkup event, thus passing the listening and learning states. Some applications need to connect to the network immediately, else they will timeout.</p> <p><b>portfast edge</b>—is used to configure a port on which an end device is connected, such as a PC. All ports directly connected to end devices cannot create bridging loops in the network.</p>

	Therefore, the edge port directly transitions to the forwarding state, and skips the listening and learning stages. <b>portfast disable</b> —when enabled an interface will jump to the forwarding state of spanning-tree.
<b>speed</b> <b>10</b>   <b>100</b>   <b>1000</b>   <b>auto</b>	Configure the Ethernet speed.. <ul style="list-style-type: none"> <li>• auto</li> </ul>
<b>vrrp</b> <b>&lt;1-255&gt;</b>	This interface is part of VRRP group number.
<b>zone-member security</b> <b>&lt;WORD&gt;</b> }	This interface is a member of zone security.
<b>Command Modes</b>	(config-if)#
<b>Usage Guidelines</b>	
Set up Ethernet parameters for this interface.	
<b>Examples</b>	
This example sets the speed for this interface to 1000. (config-if)#speed 1000	
<b>Related Commands</b>	
<i>(config-if)#bvi</i>	
<i>(config-if)#openvpn-tunnel</i>	
<i>(config-if)#tunnel</i>	
<i>(config-if)#ethernet</i>	

## (config-subif)#

```
{arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-
ignore | enable-proxy-arp | timeout <1-2147483> |
bridge-group <1-9999> |
description <LINE> |
ip [address <A.B.C.D> <A.B.C.D> | dhcp] | [dhcp client class-id <LINE> | auto |
client-id ethernet <1-2> | acsii <WORD> | auto | hex <HEX-STRING | hostname
<WORD>] | [dhcp-relay] | [firewall in | local | out <WORD>] | [policy route-
policy <WORD>] | [rip authentication key-chain <WORD> | mode md5] | text
string 0 <WORD> | 7 <WORD> | <WORD> | split-horizon disable | poison-
reverse]
ipsec restrict |
```

```

ipv6 [address <X:X:X:X::X/<0-128> | autoconfig | dhcp] [enable] | [firewall in |
out | local <WORD>] | [nd dad attempt <0-500> | managed config-flag | other-
config-flag | prefix <X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-
autoconfig | no-onlink | [ra dns server <X:X:X:X::X>] | [hop-limit <1-255> |
unspecified] | [interval <4-1800> <3-1350>] | [lifetime <0> | <4-9000>] |
[suppress] | [reachable time <0-3600000>] | [retransmission-time <0-3600000>] |
[router-preference high | low | medium] | [ospf [cost <1-65535>] | [dead-interval
<1-65535>] | [hello-interval <1-65535>] | [ifmtu] | [instance-id <0-255>] | [mtu-
ignore] | [passive] | [priority <0-255>] | [retransmit-interval <1-65535>] |
[transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip enable | split-
horizon disable | poisoned-reverse] |
lldp max-neighbors <1-50> | receive | tvl-select mac-phy-cfg | management-
address | max-frame-size | port-description | system -capabilities | system-
description | system-name | transmit |
logging event interface-ip | link-status |
mac access-group <word> deny | disable | permit |
mtu <64-9000> |
ntp [broadcast client | destination <A.B.C.D>] | [key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] | [disable] | [multicast [<A.B.C.D> | <X:X:X:X::X>] | client
<A.B.C.D> | <X:X:X:X::X>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-
4>] |
role lan | trusted | wan |
service-policy in | out |
shutdown |
snmp trap interface-ip | link-status |
spanning-tree [bpdufilter enable | disable] | [bpduguard [disable | enable] | [cost
<1-200000000>] | [guard loop | none | root | topology-change] | link-type aut |
point-to-point | shared] | mcheck | [mst cost <1-200000000> | port-priority <0-
240>] | [portfast disable | edge | network] |
vrrp <1-255> |
zone-member security <WORD>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-subif)#
{arp disable-arp-filter   enable-arp-accept   enable-arp-announce   enable-arp-ignore   enable-proxy-arp   timeout <1-2147483>	Configure ARP parameters. <b>Disable ARP filter</b> —If enabled the responds to same ARP requests coming from multiple interfaces.

	<p><b>Enable ARP Accept</b>—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table: 0—don't create new entries in the ARP table 1—create new entries in the ARP table</p>
	<p><b>Enable ARP Announce</b>—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface</p>
	<ul style="list-style-type: none"> <li>• 0—(default) Use any local address, configured on any interface</li> <li>• 1—Try to avoid local addresses that are not in the target's subnet for this interface</li> </ul>
	<p><b>Enable ARP Ignore</b>—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface</p>
	<ul style="list-style-type: none"> <li>• 0—(default) Use any local address, configured on any interface</li> <li>• 1—Try to avoid local addresses that are not in the target's subnet for this interface</li> </ul>
	<p><b>ARP Timeout</b>—If an ARP entry is not used for a specific amount of time the entry is removed from the caching table.</p>
	<p><b>Enable Proxy ARP</b>—Enable Proxy ARP if you need your IOLAN to respond to local networks with its MAC address. Default is Disabled</p>
<p><b>bridge-group</b> &lt;1-9999&gt;  </p>	<p>Add this interface to the specified bridge group.</p>
<p><b>description</b>  </p>	<p>Configure sub-interface description.</p>
<p><b>ip</b> [address &lt;A.B.C.D&gt; &lt;A.B.C.D&gt;   dhcp]   [dhcp client class-id &lt;LINE&gt;   auto   client-id ethernet &lt;1-2&gt;&gt;   acsii &lt;WORD&gt;   auto   hex &lt;HEX-STRING   hostname &lt;WORD&gt;]   [dhcp-relay]   [firewall in   local   out &lt;WORD&gt;]   [policy route-policy &lt;WORD&gt;]   [rip authentication key-chain &lt;WORD&gt;   mode md5  text string 0 &lt;WORD&gt;   7 &lt;WORD&gt;   &lt;WORD&gt;] split-</p>	<p>Configure IP parameters.</p> <p><b>IP address/IP mask</b>—Configure the IP address/mask of this interface</p> <p><b>DHCP</b>—your address is assigned from a DHCP server</p> <p><b>DHCP client</b> —</p> <p><b>Class ID:</b></p> <ul style="list-style-type: none"> <li>• Auto</li> <li>• Line</li> </ul> <p>Specify a Hex string or ASCII text. This same hex string or text would be configured on the server side and associated with an address to give the client.</p>

**horizon disable | poison-reverse |**

**Client ID:**

This can be configured to be the Ethernet interface number, ASCII text, Hex string or set to Auto.

option—60—Vendor class identifier<oem-name>:<model>:<serial#> in ASCII

**Hostname:**

Specify a value for hostname option

**DHCP-relay**—set DHCP-relay for this interface.

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic

**health-profile**—use this health profile for this interface, configure a nexthop interface

**OSPF—**

**authentication/authentication-key**—enables message-digest authentication, text, or null.  
Authentication-key 0 | 7 <WORD>

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.  
Range is 0 to 16777214  
Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead).

As with the hello interval, this value must be the same for all attached to a common network

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password

- **Key-ID**—Configure an authentication key  
**md5**—Identifies the key (password) used between this router and neighboring routers for MD5 authentication.
  - 0—unencrypted key will follow
  - specifies a hidden key will follow
  - specifies a password (key) will follow (max 16 characters).  
The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—**Configure the network type**

- **broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities
- **point-to-multipoint**— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all.
- **point-to-point**—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all.. (most common type)
- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts.

**priority**—a router with a high priority will always win the DR/BDR election process  
Priority Range is 0-255  
Default is 1



---

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission

Range is 1–65535

Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled

---

**ipsec restrict** |

Restrict IPv6 on this interface.

```

ipv6 [address
<X:X:X:X::X/<0-128> |
autoconfig | dhcp] [enable] |
[firewall in | out | local
<WORD>] | [nd dad attempt
<0-500> | managed config-flag
| other-config-flag | prefix
<X:X:X:X::X/<0-128> <0-
4294967294> | infinite | [ra dns
server <X:X:X:X::X>] | [hop-
limit <1-255> | unspecified] |
[interval <4-1800> <3-1350>] |
[lifetime <0> | <4-9000>] |
[suppress] | [reachable time
<0-3600000>] |
[retransmission-time <0-
3600000>] | [router-preference
high | low | medium] | [ospf
[cost <1-65535>] | [dead-
interval <1-65535>] | [hello-
interval <1-65535>] | [ifmtu] |

```

Configure IPv6 parameters.

**IPv6 address or DHCP**—configure the IPv6 address and prefix length or obtain an IPv6 address using DHCP

**enable**—enable IPv6 on this interface

**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic

**nd**—IPv6 Interface Neighbor Discovery sub-commands

- **dad** (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (**dad\_attempts**) to be sent before this address can be configured. Range 1–600  
Default is 1

[instance-id <0-255>] | [mtu-  
ignore] | [passive] | [priority  
<0-255>] | [retransmit-interval  
<1-65535>] | [transmit-delay  
<1-65535>] | [policy route-  
policy <WORD>] | [rip enable |  
split-horizon disable |  
poisoned-reverse] |

- managed config flags—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)
- other-config-flags—specify whether hosts use the administrated protocol for non-address auto-configuration information. Default is disabled (hosts use stateless auto-configuration of no-address information)
- prefix—specifies the IPv6 prefix advertised on the interface. Configure the prefix length. Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination. Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix. Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets. Range is 1–255. Default is 64

**interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements. Range of minimum is 3 to \*0.75 max (dynamic range). Default maximum 600 seconds, minimum is 0.33\*max. Range is 1–1800 in seconds

---

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**OSPF**—

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0–16777214

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

---

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

Default is none

The default is 10 second

**ifmtu**—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.

**instance-id**—instance ID for this interface

Values are 0–255

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**passive**—no adjacency will be formed on this interface

**priority**—a router with a high priority will always win the DR/BDR election process

Priority Range is 0-255

Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface,

The expected round-trip delay between any two routers in the attached network.

Range is 1–65535

Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission

Range is 1–65535

Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received

Default is enabled

<b>logging event interface-ip   link-status  </b>	Configure logging events for interface and link status.
<b>mtu &lt;64-9000&gt;  </b>	Configure Maximum Transmission Unit (MTU). Values are 64-9000 bytes Default is 1500 bytes
<b>ntp [broadcast client   destination &lt;A.B.C.D&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]  </b>	<p>Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc ). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.</p> <p>Configure Network Time Protocol (NTP) for this interface.</p> <p><b>broadcast client</b>—listens to NTP broadcasts</p> <p><b>destination broadcast</b>—Configure broadcast destination address</p> <p><b>multicast client</b>—listens to NTP multicasts</p> <p><b>destination multicast</b>—multicast IPv4 or IPv6 address</p> <p><b>key</b>—Configure broadcast authentication key</p> <p><b>versions</b>—1 to 4 are support.</p> <p><b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s) Default is 6</p>
<b>role lan   trusted   wan  </b>	<p>Select the role for this interface.</p> <p><b>LAN</b>—management access is from the LAN side</p> <p><b>WAN</b>—management access is from the WAN side</p> <p><b>Trusted</b>—management access from either the LAN or WAN side</p>
<b>service-policy in   out  </b>	Assign traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
<b>shutdown  </b>	Shut down this interface.

<b>snmp trap interface-ip   link-status  </b>	Set SNMP traps for interface and link status.
<b>spanning-tree [bpdufilter enable   disable]   [bpduguard [disable   enable]   [cost &lt;1-200000000&gt;]   [guard loop   none   root   topology-change]   link-type aut   point-to-point   shared]   mcheck   [mst cost &lt;1-200000000&gt;   port-priority &lt;0-240&gt;   [portfast disable   edge   network]  </b>	<p>Set interface parameters for spanning tree.</p> <p><b>bpdufilter</b>—don't send or receive BPDUs on this interface. Default is Disabled</p> <p><b>bpduguard</b>—don't accept BPDUs on this interface. Default is Disabled</p> <p><b>cost</b>—change port path cost. Value is 1 to 200000000. Default is auto (defined by STP protocol)</p> <p><b>guard</b></p> <ul style="list-style-type: none"> <li>• loop</li> <li>• none</li> <li>• root</li> <li>• topology-change</li> </ul> <p><b>link-type</b></p> <ul style="list-style-type: none"> <li>• auto—this interface is point-to-point if configured for full duplex operation</li> <li>• point-to-point</li> <li>• shared</li> </ul> <p><b>mcheck</b>—force the mode from STP to RSTP/MSTP mode</p> <p><b>mst</b>—change path cost and port priority for multiple spanning tree mode</p> <p><b>port-priority</b>—change the port priority for an instance. (increments of 16) Default is 128</p> <p><b>portfast network</b>—this feature causes the to enter the STP forwarding-state immediately or upon a linkup event, thus passing the listening and learning states. Some applications need to connect to the network immediately, else they will timeout.</p> <p><b>portfast edge</b>—is used to configure a port on which an end device is connected, such as a PC. All ports directly connected to end devices cannot create bridging loops in the network. Therefore, the edge port directly transitions to the forwarding state, and skips the listening and learning stages.</p>

	<b>Portfast disable</b> —when enabled an interface will jump to the forwarding state of spanning-tree.
<b>vrrp</b> <I-255>	This interface is part of VRRP group number.
<b>zone-member security</b> <WORD>}	Set interface to be a member of this security zone.
<b>Command Modes</b>	(config)#interface ethernet 1.2 (config-subif)#
<b>Usage Guidelines</b>	Set a sub interface within an Ethernet interface.
<b>Examples</b>	This example sets a sub interface of 100 on Ethernet 1 interface. Perle(config)# interface ethernet 1.100
<b>Related Commands</b>	<i>(config-if)#ethernet</i>

## (config-if-range)#

{alarm profile <WORD> |  
 arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-  
 ignore | enable-proxy-arp | timeout <I-2147483> |  
 authentication host-mode | multi-auth | multi-host | single-host | periodic | port-  
 control auto | forced-authorized | force-unauthorized | timer reauthenticate <I-  
 65535> | restart <I-65535> |  
 bridge-group <I-9999> |  
 description <LINE> |  
 dot1x [credential <WORD>] | [max-auth-req <I-10>] | [max-req <I-10>] | [pae  
 authenticator | supplicant] | [supplicant eap profile <WORD>] | [timeout quiet-  
 period <I-65535> | supp-period <I-65535> | tx-period <I-65535>] |  
 duplex auto | half | full |  
 ip [address <A.B.C.D> | dhcp] | [ddns service dyndns | use-web skip <WORD> |  
 url <WORD>] | [dhcp client class-id <LINE> | auto | client-id ethernet <I-2> |  
 acsii <WORD> | auto | hex <HEX-STRING> | hostname <WORD>] | [dhcp-relay] |  
 [firewall in | local | out <WORD>] | [health-profile <WORD> nexthop <A.B.C.D>  
 | dhcp] | [ospf authentication [message-digest | null | authentication-key  
 <LINE>] | [cost <I-65535> | dead-interval <I-65535> | hello-interval <I-65535> |  
 message-digest-key <I-255> md5 <LINE>] | [mtu-ignore] | [network broadcast |  
 non-broadcast | point-to-point | point-to-multipoint] | [priority <0-255>] |



```

[retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [policy route-
policy <WORD>] | [rip authentication key-chain <WORD> | mode md5 | text
string <0 | 7 | WORD> | split-horizon disable | poisoned-reverse] |
ipsec restrict |
ipv6 address <X:X:X:X::X/<0-128> | autoconfig | dhcp [enable] | [firewall in |
out | local <WORD>] | [nd dad attempt <0-500> | managed config-flag | other-
config-flag | prefix <X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-
autoconfig | no-onlink] | [ra dns server <X:X:X:X::X> | [hop-limit <1-255> |
unspecified] | [interval <4-1800> <3-1350>] | [lifetime <0> | <4-9000>] |
[suppress] | [reachable time <0-3600000>] | retransmission-time <0-3600000> |
router-preference high | low | medium] | [ospf [cost <1-65535>] | [dead-interval
<1-65535>] | [hello-interval <1-65535>] | [ifmtu] | [instance-id <0-255>] | [mtu-
ignore] | [passive | priority <0-255>] | [retransmit-interval <1-65535>] |
[transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip | split-horizon
disable | poisoned-reverse] |
lldp max-neighbors <1-50> | receive | tvl-select mac-phy-cfg | management-
address | max-frame-size | port-description | system -capabilities | system-
description | system-name | transmit |
logging event interface-ip | link-status |
mab eap |
mtu <64-9000> |
ntp [broadcast client | destination <A.B.C.D>] | [key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] | [disable] | [multicast [<A.B.C.D> | <X:X:X:X::X> | client
<A.B.C.D> | <X:X:X:X::X>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-
4>] |
power efficient-ethernet auto |
role lan | trusted | wan |
service-policy in <WORD> | out <WORD> |
shutdown |
snmp trap interface-ip | link-status |
spanning-tree [bpduguard enable | disable] | [bpduguard [disable | enable] | [cost
<1-200000000>] | [guard loop | none | root | topology-change] | [link-type auto |
point-to-point | shared] | [mcheck] | [mst cost <1-200000000>] | port-priority <0-
240>] | [portfast disable | edge | network] |
speed |
vrrp <1-255> |
zone-member security <WORD>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
{alarm profile <WORD>	(config-if-range)# Use this alarm profile for this interface.

---

**arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-ignore | enable proxy-arp | timeout <1-2147483> |**

Configure ARP parameters.

**Disable ARP filter**—If enabled the IOLAN responds to same ARP requests coming from multiple interfaces.

**Enable ARP Accept**—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table: 0—don't create new entries in the ARP table 1—create new entries in the ARP table

**Enable ARP Announce**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**ARP Timeout**—If an ARP entry is not used for a specific amount of time the entry is removed from the caching table.

**Enable Proxy ARP**—Enable Proxy ARP if you need your IOLAN to respond to local networks with its MAC address. Default is Disabled

---

**authentication host-mode | multi-auth | multi-host | single-host | periodic | port-control auto | forced-authorized | force-unauthorized | timer reauthenticate <1-65535> | restart <1-65535> |**

Configure authentication parameters to use on this interface when using Dot1x devices. Selects authentication mode to use on this interface when using Dot1x devices.

**Host Mode**

**Single host**

- Only one device can authenticate and connect on the port.
- This is the default mode of operation.

---

**Multiple host**

- Unlimited number of devices can connect on the port once a single device has been authenticated on the port. This single device must be a data (as opposed to voice) device.

**Multiple authentication**

- Each device connecting to your IOLAN is required to authenticate.
- No limit as to the number of devices which can authenticate on the port.

**Multiple authentication**

- Each device connecting to your IOLAN is required to authenticate.
- No limit as to the number of devices which can authenticate on the port.

**Port control**

- Auto—the port is locked expecting authentication from either a connected 802.1X client or if MAB is enabled, it will authenticate the MAC to the RADIUS server.
- Force authorized—the port is unsecure/unlocked meaning normal operation where no 802.1X client or MAB authentication via RADIUS is required. This is the default setting.
- Force unauthorized – the port is secured/locked and will NEVER allow any traffic to ingress into our Ethernet port/s.

**Timer****Maximum re-authentication retries—**

Set the number of times the authenticator will attempt to re-authenticate a supplicant.  
Range is 1-10 seconds  
Default is 2 seconds

**Restart timeout—**

Interval in seconds after which an attempt should be made to authenticate an unauthorized port. If the parameter “server” is specified, the time is derived from the “Session-Timeout value” (RADIUS Attribute 27)  
Range is 1-65535 seconds  
Default is 60 seconds

<b>bridge-group</b> <1-9999>	Add this interface to the specified bridge-group.
<b>description</b> <LINE>	Add this interface to the specified bridge-group.
<b>dot1x</b> [credential <WORD>]   [max-auth-req <1-10>]   [max-req <1-10>]   [pae authenticator   supplicant]   [supplicant eap profile <WORD>]   [timeout quiet-period <1-65535>]   supp-period <1-65535>   tx-period <1-65535>]	Sets the Port Access Entity (PAE) type. <b>Supplicant</b> —The interface acts only as a supplicant and does not respond to messages that are meant for an authenticator. <b>Authenticator</b> —The interface acts only as an authenticator and does not respond to any messages meant for a supplicant. <b>Both</b> —The interface behaves both as a supplicant and as an authenticator and thus does respond to all dot1x messages
<b>duplex</b> auto   half   full	Select duplex for this interface. In most cases this parameter should be left at auto
<b>ip</b> [address <A.B.C.D>   dhcp]   [ddns service dyndns   use-web-skip <WORD>   url <WORD>]   [dhcp client class-id <LINE>]   auto   client-id ethernet <1-2>   acsii <WORD>   auto   hex <HEX-STRING>   hostname <WORD>]   [dhcp-relay]   [firewall in   local   out <WORD>]   [health-profile <WORD> nexthop <A.B.C.D>]   dhcp   [ospf authentication [message-digest   null   authentication-key <LINE>]   [cost <1-65535>]   dead-interval <1-65535>]   hello-interval <1-65535>]   message-digest-key <1-255> md5 <LINE>]   [mtu-ignore]   [network broadcast   non-broadcast   point-to-point   point-to-multipoint]   [priority <0-255>]   [retransmit-interval <1-65535>]   [transmit-delay <1-65535>]   [policy route-policy <WORD>]   [rip authentication key-chain <WORD>]   mode md5   text string <0   7   WORD>]   split-horizon disable   poisoned-reverse]	Configure IP parameters. <b>IP address/IP mask</b> —Configure the IP address/mask of this interface <b>DHCP</b> —your address is assigned from a DHCP server <b>DHCP client</b> — <b>DNS dhcp</b> —use DNS servers received from DHCP server for specified interface <b>Firewall</b> —set firewall for inbound, traffic destined for this IOLAN or outbound traffic <b>health-profile</b> —use this health profile for this interface, configure a nexthop interface. <b>OSPF</b> — <b>authentication/authentication-key</b> —enables message-digest authentication, text, or null. Authentication-key 0   7 <WORD> <b>cost</b> —Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214 Default is none <b>dead-interval</b> —Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead).

---

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication.

- 0-unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).

The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—Configure the network type

- broadcast—a designated router and backup designated router are elected using OSPF multicasting capabilities
- point-to-multipoint— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all.
- point-to-point—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)

- **non-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts.

**priority**—a router with a high priority will always win the DR/BDR election process  
Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface.  
Link state advertisements in the update packet have their age incremented by this amount before transmission.  
Default is enabled  
Range is 1–65535  
Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Link state advertisements in the update packet have their age incremented by this amount before transmission.  
Default is enabled  
Range is 1–65535  
Default is 1 seconds

---

**ipsec restrict** |

Restrict IPsec on this interface.

```

ipv6 address <X:X:X:X::X/<0-128> | autoconfig | dhcp
[enable] | [firewall in | out |
local <WORD>] | [nd dad
attempt <0-500> | managed
config-flag | other-config-flag |
prefix <X:X:X:X::X/<0-128>
```

```

<0-4294967294> | infinite | no-
autoconfig | no-onlink] | [ra
dns server <X:X:X:X::X> |
[hop-limit <1-255> |
unspecified] | [interval <4-
```

```

1800> <3-1350>] | [lifetime <0>
| <4-9000>] | [suppress] |
[reachable time <0-3600000>] |
retransmission-time <0-
```

```

3600000> | router-preference
high | low | medium] | [ospf
[cost <1-65535>] | [dead-
interval <1-65535>] | [hello-
interval <1-65535>] | [ifmtu] |
[instance-id <0-255>] | [mtu-
ignore] | [passive | priority <0-
```

```

255>] | [retransmit-interval
<1-65535>] | [transmit-delay
<1-65535>] | [policy route-
policy <WORD>] | [rip | split-
horizon disable | poisoned-
reverse]|

```

Configure IPv6 parameters.

**IPv6 address or DHCP**—configure the IPv6 address and prefix length or obtain an IPv6 address using DHCP

**enable**—enable IPv6 on this interface

**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic

**nd**—IPv6 Interface Neighbor Discovery sub-commands

- **dad** (duplicate address detection) **attempts**—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (**dad\_attempts**) to be sent before this address can be configured.  
Range 1–600  
Default is 1
- **managed config flags**—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)
- **other-config-flags**—specify whether hosts use the administrated protocol for non-address auto-configuration information. Default is disabled (hosts use stateless auto-configuration of non-address information)
- **prefix**—specifies the IPv6 prefix advertised on the interface Configure the prefix length.  
Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.

Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.

Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**Interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.

Range of minimum is 3 to  $*0.75 \text{ max}$  (dynamic range)

Default maximum 600 seconds, minimum is  $0.33 * \text{max}$

Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list. The router lifetime applies only to the router's usefulness as a default router; it does not apply to information contained in other message fields or options.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0–360000 milliseconds



	<p><b>retransmission-time</b>—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE). Range 1–3600000 in milliseconds Default is 0</p> <p><b>router-preference</b>—set the default router preference. A High value means this will be preferred.</p> <ul style="list-style-type: none"> <li>• High</li> <li>• Medium</li> <li>• Low</li> </ul> <p>Default is medium</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received. Default is enabled</p>
<p><b>lldp max-neighbors &lt;1-50&gt;   receive   tvl-select mac-phy-cfg   management-address   max-frame-size   port-description   system -capabilities   system-description   system-name   transmit  </b></p>	Configure LLDP parameters.
<p><b>logging event interface-ip   link-status  </b></p>	Configure logging events for interface and link status.
<p><b>mab eap  </b></p>	Sets MAC authentication bypass interface commands.
<p><b>mtu &lt;64-9000&gt;  </b></p>	Configure maximum transmission unit (MTU). Values are 64-9000 Default is
<p><b>ntp [broadcast client   destination &lt;A.B.C.D&gt;   [key &lt;1-65534&gt;   [minpoll &lt;4-17&gt;   [version &lt;1-4&gt;   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;   client</b></p>	Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc )

---

```
<A.B.C.D> | <X:X:X:X::X> |
[key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] |
```

You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.

Configure Network Time Protocol (NTP) for this interface.

Network Time Protocol (NTP) is used distribute and maintain synchronization of time information between nodes in a network

The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc ).

You can run the SNTP client and the NTP server concurrently on your system.

Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.

Configure Network Time Protocol (NTP) for this interface.

**broadcast client**—listens to NTP broadcasts

**destination broadcast**—Configure broadcast destination address

**multicast client**—listens to NTP multicasts

**destination multicast**—multicast IPv4 or IPv6 address

**key**—Configure broadcast authentication key.

**versions** 1 to 4 are support.

**minimum poll interval** is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s). Default is 6

---

```
power efficient-ethernet auto |
```

Configure Ethernet interface power settings.

---

```
role lan | trusted | wan |
```

Select the role for this interface.

**LAN**—management access is from the LAN side.

**WAN**—management access is from the WAN side.

**Trusted**—management access from either the LAN or WAN side.

<b>service-policy in</b> <WORD>   <b>out</b> <WORD>	Assign traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
<b>shutdown</b>	Shutdown this interface.
<b>snmp trap interface-ip</b>   <b>link-status</b>	Set SNMP traps for interface and link status.
<b>spanning-tree</b> [ <b>bpdufilter</b> <b>enable</b>   <b>disable</b> ]   [ <b>bpduguard</b> [ <b>disable</b>   <b>enable</b> ]   [ <b>cost</b> <1-200000000>]   [ <b>guard loop</b>   <b>none</b>   <b>root</b>   <b>topology-change</b> ]   [ <b>link-type</b> <b>auto</b>   <b>point-to-point</b>   <b>shared</b> ]   [ <b>mcheck</b> ]   [ <b>mst cost</b> <1-200000000>]   [ <b>port-priority</b> <0-240>]   [ <b>portfast</b> <b>disable</b>   <b>edge</b>   <b>network</b> ]	<p>Configure interface parameters for spanning tree.</p> <p><b>bpdufilter</b>—don't send or receive BPDUs on this interface. Default is Disabled</p> <p><b>bpduguard</b>—don't accept BPDUs on this interface. Default is Disabled</p> <p><b>cost</b>—change port path cost. Value is 1 to 200000000. Default is auto (defined by STP protocol)</p> <p><b>guard</b></p> <ul style="list-style-type: none"> <li>• loop</li> <li>• none</li> <li>• root</li> <li>• topology-change</li> </ul> <p><b>link-type</b></p> <ul style="list-style-type: none"> <li>• auto—this interface is point-to-point if configured for full duplex operation</li> <li>• point-to-point</li> <li>• shared</li> </ul> <p><b>mcheck</b>—force the mode from STP to RSTP/MSTP mode</p> <p><b>mst</b>—change path cost and port priority for multiple spanning tree mode</p> <p><b>port-priority</b>—change the port priority for an instance. (increments of 16) Default is 128</p> <p><b>portfast network</b>—this feature causes the to enter the STP forwarding-state immediately or upon a linkup event, thus passing the listening and learning states. Some applications need to connect to the network immediately, else they will timeout</p>

	<b>portfast edge</b> —is used to configure a port on which an end device is connected, such as a PC. All ports directly connected to end devices cannot create bridging loops in the network. Therefore, the edge port directly transitions to the forwarding state, and skips the listening and learning stages.
<b>speed</b>	Configure the Ethernet speed <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>
<b>vrrp &lt;1-255&gt;</b>	This interface is part of VRRP group number.
<b>zone-member security &lt;WORD&gt;</b> }	This interface is a member of zone security.
<b>Command Modes</b>	<b>(config-if-range)#</b>

### Usage Guidelines

Set parameters for multiple Ethernet ports.

### Examples

This example restricts IPv6 on Ethernet port range 1-2.

```
(config)#interface range ethernet 1 , 2
(config-if-range)#ipsec restrict
```

### Related Commands

```
(config-if)#bvi
(config-if)#dialer
(config-if)#openvpn-tunnel
(config-if)#tunnel
```

## (config-if)#openvpn-tunnel

```
{<0-999> tap | tun |
bridge-group <1-9999> |
description <LINE> |
ip [ddns service dyndns | use-web skip <WORD> | url <WORD>] | [dhcp-relay] |
[firewall in | local | out <WORD>] | [health-profile <WORD> nexthop <A.B.C.D>] |
[dhcp] | [ospf authentication message-digest | null] | [authentication-key
<LINE>] | [cost <1-65535>] | [dead-interval <1-65535>] | [hello-interval <1-
65535>] | [message-digest-key <1-255> md5 <LINE>] | [mtu-ignore | network
broadcast | non-broadcast | point-to-point | point-to-multipoint] | [priority <0-
```

255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip authentication key-chain <WORD> | mode md5 | text string <0 | 7 | WORD> | split-horizon disable | poisoned-reverse] |  
 ipv6 [enable] | [firewall in | local | out] | | [nd dad attempt <0-500> | managed config-flag | other-config-flag | prefix <X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-autoconfig | no-onlink | [ra dns server <X:X:X:X::X> | [hop-limit <1-255> | unspecified] | [interval <4-1800> <3-1350> | [lifetime <0> | <4-9000>] | [suppress] | [reachable time <0-3600000>] | [retransmission-time <0-3600000>] | [router-preference high | low | medium] | [ifmtu] | [instance-id <0-255>] | [mtu-ignore] | [passive] | [priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [ospf cost <1-65535>] | [dead-interval <1-65535>] | [hello-interval <1-65535>] | [instance-id <0-255>] | [mtu-ignore] | [passive] | [priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip | split-horizon disable | poisoned-reverse] | logging event interface-ip | link-status |  
 ntp [broadcast client | destination <A.B.C.D>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-4>] | [disable] | [multicast [<A.B.C.D> | <X:X:X:X::X> | client <A.B.C.D> | <X:X:X:X::X>] | [key <1-65534>] | [minpoll <4-17>] | [version <1-4>] |  
 role lan | trusted | wan |  
 service-policy in <WORD> | out <WORD> |  
 snmp trap interface-ip | link-status |  
 zone-member security <WORD>}  
 Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>(config-if)# openvpn-tunnel</b> {<0-999> tap   tun	Tunnel interface number. Choose tap or tun device. tap (L2 link layer) tun (L3 network layer)
<b>bridge-group &lt;1-9999&gt;  </b>	Sets transparent bridging interface parameters.
<b>description &lt;LINE&gt;  </b>	Description for this interface.
<b>ip</b> [ddns service dyndns   use-web skip <WORD>   url <WORD>]   [dhcp-relay]   [firewall in   local   out <WORD>]   [health-profile <WORD> nexthop <A.B.C.D>]   [dhcp]   [ospf authentication	Configure IP parameters. <b>DDNS</b> — <b>Service</b> —use dyndns login/password—configure the login id and password for the dnydns server <b>Host/host-group</b> —Hostname/list of hostnames registered with the DDNS service

```

message-digest | null |
[authentication-key <LINE>] |
[cost <1-65535>] | [dead-
interval <1-65535>] | [hello-
interval <1-65535>] |
[message-digest-key <1-255>
md5 <LINE>] | [mtu-ignore |
network broadcast | non-
broadcast | point-to-point |
point-to-multipoint] |
[priority<0-255>] |
[retransmit-interval <1-
65535>] | [transmit-delay <1-
65535>] | [policy route-policy
<WORD>] | [rip
authentication key-
chain<WORD> | mode md5 |
text string <0 | 7 | WORD> |
split- horizon disable |
poisoned-reverse] |

```

Configure IP parameters.

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dnydns server

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service

**skip**—skip everything before this ont he given URL

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the IOLAN to be seen on the Internet as a public address

**DHCP-relay**—set DHCP-relay for this interface

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic

**health-profile**—use this health profile for this interface, configure a nexthop interface

**OSPF**—

**authentication/authentication-key**—enables message-digest authentication, text, or null.

Authentication-key 0 | 7 <WORD>

**cost**—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214  
Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters.

There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication.

- 0—unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).

The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—Configure the network type

**broadcast**—a designated router and backup designated router are elected using OSPF multicasting capabilities point-to-multipoint — configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required.

Routers on an interface becoming neighbors should match the network type all.

- point-to-point—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)
- non-broadcast—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts.

**priority**—a router with a high priority will always win the DR/BDR election process

Priority Range is 0-255

Default is 1

	<p><b>retransmit-interval</b>—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network. Range is 1–65535 Default is 5 second</p> <p><b>transmit-delay</b>—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface.</p> <p><b>route-policy</b>—enable this policy route for this interface</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received Default is enabled</p>
<p><b>ipv6</b> [enable]   [firewall in   local  out]     [nd dad attempt &lt;0-500&gt;   managed config-flag   other-config-flag   prefix &lt;X:X:X:X::X/&lt;0-128&gt; &lt;0-4294967294&gt;   infinite   [ra dns server &lt;X:X:X:X::X&gt;   [hop-limit &lt;1-255&gt;   unspecified]   [interval &lt;4-1800&gt; &lt;3-1350&gt;]   [lifetime &lt;0&gt;   &lt;4-9000&gt;]   [suppress]   [reachable time &lt;0-3600000&gt;]   [retransmission-time &lt;0-3600000&gt;]   [router-preference high   low  medium]   [ifmtu]   [instance-id &lt;0-255&gt;]   [mtu-ignore]   [passive]   [priority &lt;0-255&gt;]   [retransmit - interval &lt;1-65535&gt;]   [transmit-delay &lt;1-65535&gt;]   [ospf [cost &lt;1-65535&gt;]   [dead-interval &lt;1-65535&gt;]   [hello-interval &lt;1-65535&gt;]   [instance-id &lt;0-255&gt;]   [mtu-ignore]   [passive]   [priority &lt;0-255&gt;]   [retransmit -</p>	<p>Configure IPv6 parameters.</p> <p><b>enable</b>—enable IPv6 on this interface</p> <p><b>firewall</b>—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.</p> <p><b>nd</b>—IPv6 Interface Neighbor Discovery sub-commands</p> <ul style="list-style-type: none"> <li>• dad (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (dad_attempts) to be sent before this address can be configured. Range 1–600 Default is 1</li> <li>• managed config flags—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)</li> <li>• prefix—specifies the IPv6 prefix advertised on the interface Configure the prefix length. Range is 0–128</li> </ul>



```

interval <1-65535> |
[transmit-delay <1-65535> |
ospf [cost <1-65535> | [dead-
interval <1-65535> | [hello-
interval <1-65535> |
[instance-id <0-255> | [mtu-
ignore] | [passive] |
[priority<0-255> |
[retransmit-interval <1-
```

```

65535> | [transmit-delay <1-
```

```

65535> | [policy route-policy
<WORD> | [rip | split-horizon
disable | poisoned-reverse] |
```

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination. Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix. Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**Interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.

Range of minimum is 3 to \*0.75 max (dynamic range)

Default maximum 600 seconds, minimum is 0.33\*max

Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list.

The router lifetime applies only to the router's usefulness as a default router, it does not apply to information contained in other message fields or options.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

---

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**OSPF**—

**authentication/authentication-key**—enables message-digest authentication, text, or null.

Authentication-key 0 | 7 <WORD>

**cost**—Configure a default metric to be applied to routes being distributed into OSPF.

Range is 0 to 16777214

Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**ifmtu**—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.

**instance-id**—instance ID for this interface  
Values are 0–255

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

	<p><b>passive</b>—no adjacency will be formed on this interface</p> <p><b>priority</b>—a router with a high priority will always win the DR/BDR election process Priority Range is 0-255 Default is 1</p> <p><b>retransmit-interval</b>—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface,</p> <p><b>policy route-policy</b>—enable this policy route for this interface.</p> <p><b>rip</b>—enable split horizon to prevent a routing loop in your network. <b>Basically, information about the routing for a</b> particular packet is never sent back in the direction from which it was received. Default is enabled</p>
<p><b>logging event interface-ip   link-status  </b></p>	<p>Configure logging events for interface and link status.</p>
<p><b>ntp [broadcast client   destination &lt;A.B.C.D&gt;   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]  </b></p>	<p>Network Time Protocol (NTP) is used distribute and maintain synchronization of time information between nodes in a network The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOAN's etc ). You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.</p> <p>Configure Network Time Protocol (NTP) for this interface.</p> <p><b>broadcast client</b>—listens to NTP broadcasts <b>destination broadcast</b>—Configure broadcast destination address <b>multicast client</b>—listens to NTP multicasts <b>destination multicast</b>—multicast IPv4 or IPv6 address. <b>key</b>—Configure broadcast authentication key. <b>versions</b> 1 to 4 are support.</p>

	<b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s). Default is 6
<b>role lan   trusted   wan  </b>	Select the role for this interface. <b>LAN</b> —management access is from the LAN side. <b>WAN</b> —management access is from the WAN side. <b>Trusted</b> —management access from either the LAN or WAN side.
<b>service-policy in &lt;WORD&gt;   out &lt;WORD&gt;  </b>	Assign traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.
<b>snmp trap interface-ip   link-status</b>	Set SNMP traps for interface and link status.
<b>zone-member security &lt;WORD&gt; }</b>	This interface is a member of this zone security.
<b>Command Modes</b>	(config-if)#

### Usage Guidelines

Set configuration parameters for OpenVPN tunnel.

### Examples

This example sets SNMP to trap for link-status.

```
(config-if)#snmp trap link-status
```

### Related Commands

*(config-if)#bvi*

*(config-if)#tunnel*

*(config-if)#ethernet*

## (config-if)#tunnel

```
{<0-999> mode [gre | ipv6ip] |
arp disable-arp-filter | enable-arp-accept | enable-arp-announce | enable-arp-
ignore | enable-proxy-arp |
ip [address <A.B.C.D> <A.B.C.D>] | [ddns service dyndns | use-web skip
<WORD> | url <WORD>] | [dhcp-relay] | [firewall in | local | out <WORD>] |
[health-profile <WORD> nexthop <A.B.C.D>] | [ospf authentication message-
digest | null] | [authentication-key <LINE>] | [cost <1-65535>] | [dead-interval
<1-65535>] | [hello-interval <1-65535>] | [message-digest-key <1-255> md5
<LINE>] | [mtu-ignore] | [network broadcast | non-broadcast | point-to-point] |
```

```

point-to-multipoint] | [priority <0-255>] | [retransmit-interval <1-65535>] |
[transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip authentication
key-chain <WORD> | mode md5 | text string 0 <WORD> | 7 <WORD> |
<WORD>] | [split-horizon disable | poisoned-reverse] |
ipsec restrict |
ipv6 [address <X:X:X:X::X/<2-128>] | [enable] | [firewall in | local | out
<WORD>] | [nd dad attempts <0-600> | managed config-flag | other-config-flag |
prefix <X:X:X:X::X/<0-128> <0-4294967294> | infinite | no-autoconfig | on-
onlink] | [ra dns server <X:X:X:X::X> | hop-limit <1-255> | unspecified] |
interval <4-1800> <3-1350>] | [lifetime <0> <4-9000>] | [suppress] | [reachable
time <0-3600000>] | [retransmission-time <0-3600000>] | [router-preference
high | low | medium] | [ospf cost <1-65535>] | [dead-interval <1-65535>] | [hello-
interval <1-65535>] | [ifmtu] | [instance-id <0-255>] | [mtu-ignore] | [passive] |
[priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-
65535>] | [policy route-policy <WORD>] | [rip | split-horizon disable | poisoned-
reverse] |
logging event interface-ip | link-status |
mtu <64-1500> |
ntp broadcast client | destination <A.B.C.D> | key <1-65534> | minpoll <4-17> |
version <1-4> | disable | multicast <A.B.C.D> | <X:X:X:X::X> | client <A.B.C.D>
| <X:X:X:X::X> | key <1-65534> | minpoll <4-17> | version <1-4> |
role lan | trusted | wan |
service-policy in <WORD> | out <WORD> |
shutdown |
snmp interface-ip | link-status |
tunnel destination <A.B.C.D> | multicast source <A.B.C.D> source <A.B.C.D> |
| ethernet <1-2> . <1-4000> | tos <0-99> | ttl <1-255> |
zone-member security <WORD>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax Description	(config-if)# tunnel
{tunnel <0-999> mode [gre ip   ipv6ip 6in4]	Sets mode gre and ipv6up tunnel interface parameters.
arp disable-arp-filter   enable-arp-accept   enable-arp-announce   enable-arp-ignore   enable-proxy-arp   timeout <1-2147483>	Configure ARP parameters. <b>Disable ARP filter</b> —If enabled the IOLAN responds to same ARP requests coming from multiple interfaces.

**Enable ARP Accept**—Define behavior for gratuitous ARP frames who's IP is not already present in the ARP table:

0—don't create new entries in the ARP table

1—create new entries in the ARP table

**Enable ARP Announce**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface.

**Enable ARP Ignore**—Define different restriction levels for announcing the local source IP address from IP packets in ARP requests sent on interface

- 0—(default) Use any local address, configured on any interface
- 1—Try to avoid local addresses that are not in the target's subnet for this interface

**ARP Timeout**—If an ARP entry is not used for a specific amount of time the entry is removed from the caching table.

**Enable Proxy ARP**—Enable Proxy ARP if you need your IOLAN to respond to local networks with its MAC address. Default is Disabled

```
ip [address <A.B.C.D>
<A.B.C.D>] | [ddns service
dyndns | use-web skip
<WORD> | url <WORD>] | [
dhcp-relay] | [firewall in | local
| out <WORD>] | [health-
profile <WORD> nexthop
<A.B.C.D>] | [ospf
authentication message-digest
| null] | [authentication-key
<LINE>] | [cost <1-65535>] |
[dead-interval <1-65535>] |
[hello-interval <1-65535>] |
[message-digest-key <1-255>
md5 <LINE>] | [mtu-ignore] |
```

Configure IP parameters.

**IP address/IP mask**—Configure the IP address/mask of this interface

**DHCP**—your address is assigned from a DHCP server

**DDNS**—

**Service**—use dyndns

login/password—configure the login id and password for the dnydns server

**Host/host-group**—Hostname/list of hostnames registered with the DDNS service

**skip**—skip everything before this ont he given URL

[network broadcast | non-broadcast | point-to-point] | [priority <0-255>] | [retransmit-interval <1-65535>] | [transmit-delay <1-65535>] | [policy route-policy <WORD>] | [rip authentication key-chain <WORD> | mode md5 | text string 0 <WORD> | 7 <WORD> | <WORD>] | [split-horizon disable | poisoned-reverse]

**Use-web URL**—Enter the URL that you want to obtain an IP address from. This allows the IOLAN to be seen on the Internet as a public address

**DHCP client** —

**Class ID:**

- Auto
- Line

Specify a Hex string or ASCII text. This same hex string or text would be configured on the server side and associated with an address to give the client.

**Client ID:**

This can be configured to be the Ethernet interface number, ASCII text, Hex string or set to Auto.

option—60—Vendor class identifier<oem-name>:<model>:<serial#> in ASCII

**Hostname:**

Specify a value for hostname option

**DHCP-relay**—set DHCP-relay for this interface

**DNS dhcp**—use DNS servers received from DHCP server for specified interface

**Firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**health-profile**—use this health profile for this interface, configure a nexthop interface

**OSPF—**

**authentication/authentication-key**—enables message-digest authentication, text, or null. Authentication-key 0 | 7 <WORD>

**cost**—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0 to 16777214  
Default is none

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead). As with the hello interval, this value must be the same for all attached to a common network.

Default is 4 times the hello interval

Default is 40 seconds

---

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

The default is 10 seconds.

**message-digest-key**—Configure a password used by neighboring routers for simple password authentication. It can be any continuous string of up to eight characters. There is no default value.

- None—no password
- Key-ID—Configure an authentication key
- md5—Identifies the key (password) used between this router and neighboring routers for MD5

authentication.

- 0—unencrypted key will follow
- specifies a hidden key will follow
- specifies a password (key) will follow (max 16 characters).

The default is none

**mtu-ignore**—By default, OSPF checks whether neighbors are using the same MTU on a common interface. Use this command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

**network**—Configure the network type

- broadcast—a designated router and backup designated router are elected using OSPF multicasting capabilities point-to-multipoint— configures selected routers with neighbor/cost parameters, identifying a specific cost for the connection to the specified peer neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all.
- point-to-point—there are only two neighbors and multicast is not required. Routers on an interface becoming neighbors should match the network type all. (most common type)



- **nnon-broadcast**—use this type of network on networks having no broadcast/multicast capability, such as frame-relay, ATM, SMDS, & X.25. The key point is that these layer 2 protocols are unable to send broadcasts/multicasts.

**priority**—a router with a high priority will always win the DR/BDR election process  
Priority Range is 0-255  
Default is 1

**retransmit-interval**—configure the time between retransmitting lost link advertisements) Time in seconds between link state advertisement retransmissions for adjacencies belonging to the interface, The expected round-trip delay between any two routers in the attached network.  
Range is 1–65535  
Default is 5 second

**transmit-delay**—configure the transmit delay. The estimated time in seconds required to transmit a link state update packet on the interface. Link state advertisements in the update packet have their age incremented by this amount before transmission  
Range is 1–65535  
Default is 1 seconds

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received.  
Default is enabled

---

### ipsec restrict |

Restrict IPsec on this interface.

---

**ipv6** [**address** <X:X:X:X::X/<2-128> **eui-64**] | [**enable**] | [**firewall** **in** | **local** | **out** <WORD>] | [**nd** **dad** **attempts** <0-600> | **managed** **config-flag** | **other-config-flag** | **prefix** <X:X:X:X::X/<0-128> <0-4294967294> | **infinite**] | [**ra** **dns** **server** <X:X:X:X::X> | **hop-limit** <1-255> | **unspecified**] | **interval** <4-

**address**—specify an IPv6 address.  
**enable**—enable IPv6 on this interface.  
**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic  
**nd**—IPv6 Interface Neighbor Discovery sub-commands

- **dad** (duplicate address detection) **attempts**—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages.

```

1800> <3-1350 | lifetime <0>
<4-9000> | suppress |
reachable time <0-3600000> |
retransmission-time <0-
3600000> | router-preference
high | low | medium | [ospf
cost <1-65535> | [dead-interval
<1-65535>] | [hello-interval
<1-65535>] | [ifmtu] |
[instance-id <0-255>] | [mtu-
ignore] | [passive] | [priority
<0-255>] | [retransmit-interval
<1-65535>] | [transmit-delay
<1-65535>] | [policy route-
policy <WORD>] | [rip | split-
horizon disable | poisoned-
reverse] |

```

- Use this command to specify the number of consecutive Neighbor Solicitation messages (dad\_attempts) to be sent before this address can be configured.  
Range 1–600  
Default is 1
- managed config flags—specify whether hosts use the administrated protocol for address auto-configuration.  
Default is disabled (host uses stateless)
- other-config-flags—specify whether hosts use the administrated protocol for non-address auto-configuration information.  
Default is disabled (hosts use stateless auto-configuration of no-address information)
- prefix—specifies the IPv6 prefix advertised on the interface. Configure the prefix length.  
Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.  
Default is off

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.  
Default is off

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.  
Range is 1–255  
Default is 64

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

---

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**Interval**—Specifies the maximum/minimum time allowed between sending unsolicited multicast router advertisements.

Range of minimum is 3 to  $*0.75 \text{ max}$  (dynamic range)

Default maximum 600 seconds, minimum is  $0.33*\text{max}$

Range is 1–1800 in seconds

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list. The router lifetime applies only to the router's usefulness as a default router; it does not apply to information contained in other message fields or options.

Range is 1–9000 seconds

Default is 1800 seconds

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- High
- Medium
- Low

Default is medium

**OSPF—**

**cost**—Configure a default metric to be applied to routes being distributed into OSPF. Range is 0–16777214

Default is 4 times the hello interval

Default is 40 seconds

**dead-interval**—Configure the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down (dead.) As with the hello interval, this value must be the same for all attached to a common network.

**hello interval**—Configure the hello packet time interval for hello packets sent on an interface.

Default is none

Default is enabled

The default is 10 second

**ifmtu**—The range is dynamic (depending on the interface type) and it will match with the MTU value set on the interface.

**instance-id**—instance ID for this interface  
Values are 0–255

**passive**—no adjacency will be formed on this interface

**priority**—a router with a high priority will always win the DR/BDR election process  
Priority Range is 0-255

Default is 1

**policy route-policy**—enable this policy route for this interface.

**rip**—enable split horizon to prevent a routing loop in your network. Basically, information about the routing for a particular packet is never sent back in the direction from which it was received

---

**logging event interface-ip | link-status |**

Configure logging events for interface and link status.

---

**mtu <64-9000> |**

Configure maximum transmission unit (MTU).

Values are 64-9000

Default is 1476

---

```
ntp [broadcast client |
destination <A.B.C.D>] | [key
<1-65534>] | [minpoll <4-17>]
| [version <1-4>] | [disable] |
[multicast [<A.B.C.D> |
<X:X:X:X::X>] | client
<A.B.C.D> | <X:X:X:X::X>] |
[key <1-65534>] | [minpoll <4-
17>] | [version <1-4>] |
```

Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc ).

You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.

Configure Network Time Protocol (NTP) for this interface.

**broadcast client**—listens to NTP broadcasts

**destination broadcast**—Configure broadcast destination address

**multicast client**—listens to NTP multicasts

**destination multicast**—multicast IPv4 or IPv6 address

**key**—Configure broadcast authentication key  
versions 1 to 4 are supported.

**minimum poll interval** is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s)  
Default is 6

---

```
role lan | trusted | wan |
```

Select the role for this interface.

**LAN**—management access is from the LAN side

**WAN**—management access is from the WAN side

**Trusted**—management access from either the LAN or WAN side

---

```
service-policy in <WORD> |
out <WORD> |
```

Assign traffic policy to this interface. Select whether the policy will apply to inbound or outbound traffic.

---

```
shutdown |
```

Shutdown this interface.

---

```
snmp interface-ip | link-status
|
```

Configure SNMP traps for interface and link status.

<b>tunnel destination</b> <A.B.C.D>   <b>multicast source</b> <A.B.C.D> <b>source</b> <A.B.C.D>   <b>cellular</b> <0-0>   <b>dot11radio</b> <0-4>   <b>ethernet</b> <1-2> . <1-4000>   <b>tos</b> <0-99>   <b>ttl</b> <1-255>	Configure tunnel parameters.
<b>zone-member security</b> <WORD> }	This interface is a member of this zone security.
<b>Command Modes</b>	(config-if)#

### Usage Guidelines

Use this command to configure tunnel interface parameters.

### Examples

This example enables ARP accepts on this interface.

```
(config-if)# arp enable-accepts
```

### Related Commands

*(config-if)#bvi*

*(config-if)#dialer*

*(config-if)#openvpn-tunnel*

*(config-if)#ethernet*

## (config-if-vrrp)#

```
{[authentication 0 <WORD> | 7 <WORD>] | [md5 key-string 0 <WORD> | text] |  
[text 0 <WORD> | 7 <WORD>]  
description <LINE> |  
ip <A.B.C.D> <A.B.C.D> | [firewall in | local | out <WORD>] | [health-profile  
<WORD> nexthop <A.B.C.D>] | [policy route-policy <WORD>] |  
ipsec restrict |  
ipv6 [address <X:X:X:X::X/<0-128>] | [enable] | [firewall in | out | local] | [nd  
dad attempts <0-600>| managed-config-flag | other-config-flag | prefix  
<X:X:X:X::X/<0-128> | <0-4294967294> | infinite] | no-autoconfig | no-onlink] |  
[ra dns server <X:X:X:X::X>] | [hop-limit <1-255> | unspecified] | [interval <4-  
1800> <3-1350>] | [lifetime <0> | <4-9000>] | [suppress] | [reachable time <0-  
3600000>] | [retransmission-time <0-3600000>] | [router-preference high | low  
| medium] | [policy route-policy <WORD>] | [rip enable | split-horizon disable |  
poisoned-reverse]  
logging event interface-ip | link-status |  
mtu <68-1500> |
```

```

ntp broadcast client | destination <A.B.C.D> | key<1-65534> | minpoll <4-17> |
version <1-4> | disable | multicast <A.B.C.D> | <X:X:X:X::X> | client <A.B.C.D>
| <X:X:X:X::X> | key <1-65534> | minpoll <4-17> | version <1-4>
peer-address <A.B.C.D> |
preempt delay <0-1000> |
priority <1-254> |
role lan | trusted | wan |
shutdown |
snmp trap interface-ip | link status |
sync-group |
timers advertise <10-255000> |
version <2-3> |
zone-member security <WORD>}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description	(config-if-vrrp)#
{[authentication 0 <WORD>   7 <WORD>]   [md5 key-string 0 <WORD>   text]   [text 0 <WORD>   7 <WORD>]}	Configure VRRP authentication parameters. Configure the VRRP authentication clear text/cipher password for the VRRP group on an interface. If this option is not set, the interface is not required to authenticate to the VRRP group.	
description <LINE>	Configure VRRP description.	
ip <A.B.C.D> <A.B.C.D>   [firewall in   local   out <WORD>]   [health-profile <WORD> nexthop <A.B.C.D>]   [policy route-policy <WORD>]	Configure IP parameters. <b>IP address/IP mask</b> —Configure the IP address/mask of this interface <b>Firewall</b> —set firewall for inbound, traffic destined for this IOLAN or outbound traffic <b>health-profile</b> —use this health profile for this interface, configure a nexthop interface <b>policy route-policy</b> —enable this policy route for this interface.	
ipsec restrict	Restrict IPsec on this interface.	

```

ipv6 [address
<X:X:X:X::X/<0-128>] |
[enable] | [firewall in | out |
local] | [nd dad attempts <0-
600>] managed-config-flag |
other-config-flag | prefix
<X:X:X:X::X/<0-128> | <0-
4294967294> | infinite] | no-
autoconfig | no-onlink] | [ra
dns server <X:X:X:X::X>] |
[hop-limit <1-255> |
unspecified] | [interval <4-
1800> <3-1350>] | [lifetime
<0> | <4-9000>] | [suppress] |
[reachable time <0-3600000>]
| [retransmission-time <0-
3600000>] | [router-
preference high | low | medium]
| [policy route-policy
<WORD>] | [rip enable | split-
horizon disable | poisoned-
reverse] |

```

Configure IPv6 parameters.

**IPv6 address/IP mask**—Configure the IP address/mask of this interface

**enable**—enable IPv6 on this interface.

**firewall**—set firewall for inbound, traffic destined for this IOLAN or outbound traffic.

**nd**—IPv6 Interface Neighbor Discovery sub-commands.

- **dad** (duplicate address detection) attempts—To check the uniqueness of an IPv6 address, a node sends Neighbor Solicitation messages. Use this command to specify the number of consecutive Neighbor Solicitation messages (`dad_attempts`) to be sent before this address can be configured. Range 1–600  
Default is 1
- **managed config flags**—specify whether hosts use the administrated protocol for address auto-configuration. Default is disabled (host uses stateless)
- **other-config-flags**—specify whether hosts use the administrated protocol for non-address auto-configuration information.

Default is disabled (hosts use stateless auto-configuration of no-address information)

- **prefix**—specifies the IPv6 prefix advertised on the interface Configure the prefix length.  
Range is 0–128

**no-autoconfig**—A prefix is onlink when it is assigned to an interface on a specified link. Enable or disable prefix for onlink determination.  
Default is off

Default is disabled (hosts use stateless auto-configuration of no-address information)

- **prefix**—specifies the IPv6 prefix advertised on the interface Configure the prefix length.  
Range is 0–128



---

**no-onlink**—The sending router can indicate that a prefix is to be used for address autoconfiguration by setting the autonomous flag and specifying a nonzero Valid Lifetime value for the prefix.

**ra**—Router Advertisement Control

**dns server**—specify the name server in RA.

**hop-limit**—Specifies the Hop Count field of the IP header for outgoing (unicast) IP packets.

Range is 1–255

Default is 64

**interval**—The maximum time interval between sending unsolicited multicast router advertisements from the interface, in seconds.

Range is 4-1800 seconds

minimum 3-1350

Default is 1800 seconds

0 = not a default route

**lifetime**—The lifetime associated with the default router in seconds. A value of 0 indicates that the router is not a default router and doesn't appear on the default router list. The router lifetime applies only to the router's usefulness as a default router; it does not apply to information contained in other message fields or options.

Range is 4-9000 seconds

Default is 3 x the max-interval

0 = not a default route

**suppress**—enable or disable IPv6 Router advertisements.

Default is send router advertisements

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**reachable time**—specifies the length in time (milliseconds) a node assumes a neighbor is reachable after receiving a reachability confirmation

Default is 0 (unspecified by this router)

Range is 0-360000 milliseconds

**retransmission-time**—The retransmission timer is used to control the time (in milliseconds) between retransmissions of neighbor solicitation messages from the user equipment (UE).

Range 1–3600000 in milliseconds

Default is 0

**router-preference**—set the default router preference. A High value means this will be preferred.

- **High**
- **Medium**
- **Low**

Default is medium

**policy route-policy**—enable this policy route for this interface.

---

**logging event interface-ip | link-status |**

Configure logging events for interface and link status.

---

**mtu <64-9000> |**

Configure maximum transmission unit (MTU).

Values are 64 to 9000 bytes

Default is 1500 bytes

<pre>ntp [broadcast client   destination &lt;A.B.C.D&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4-17&gt;]   [version &lt;1-4&gt;]   [disable]   [multicast [&lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   client &lt;A.B.C.D&gt;   &lt;X:X:X:X::X&gt;]   [key &lt;1-65534&gt;]   [minpoll &lt;4- 17&gt;]   [version &lt;1-4&gt;]  </pre>	<p>Network Time Protocol (NTP) is used to distribute and maintain synchronization of time information between nodes in a network. The IOLAN can provide the time to NTP/SNTP capable client devices (or other Perle routers and IOLAN's etc ).</p> <p>You can run the SNTP client and the NTP server concurrently on your system. Therefore you can obtain time from an outside source and serve that time to the devices connected to the IOLAN.</p> <p>Configure Network Time Protocol (NTP) for this interface.</p> <p><b>broadcast client</b>—listens to NTP broadcasts</p> <p><b>destination broadcast</b>—Configure broadcast destination address.</p> <p><b>multicast client</b>—listens to NTP multicasts.</p> <p><b>destination multicast</b>—multicast IPv4 or IPv6 address.</p> <p><b>key</b>—Configure broadcast authentication key.</p> <p><b>versions</b> 1 to 4 are supported.</p> <p><b>minimum poll interval</b> is 4(16s), 5(32 s), 6 (1m 4s), 7(2m,8s), 8(4m,16s), 9(8m, 32s), 10 (17,m, 4s), 11 (34,m,8s) Default is 6</p>
<pre>peer-address &lt;A.B.C.D&gt;  </pre>	<p>Configure an unicast VRRP peer IP address.</p>
<pre>preempt delay &lt;0-1000&gt;  </pre>	<p>By default, the preemption delay is 0, indicating immediate preemption. In immediate preemption mode, a backup immediately switches to the master when detecting that its priority is higher than the master's priority.</p> <p>Delay is 0 to 1000 in seconds.</p> <p><b>Disabled</b>—Even if a VRRP router with a higher priority than the current master is up, it does not replace the current master. Only the original master (when it becomes available) replaces the backup.</p> <p>Values 1-000 seconds Default is 0 (no delay)</p>
<pre>priority &lt;1-255&gt;  </pre>	<p>The priority value for the VRRP router that owns the IP address(es) associated with the virtual router.</p> <p>Values are 1-255 Default is 100</p>

<b>role lan   trusted   wan  </b>	<p>Select the role for this interface.</p> <p><b>LAN</b>—management access is from the LAN side.</p> <p><b>WAN</b>—management access is from the WAN side.</p> <p><b>Trusted</b>—management access from either the LAN or WAN side.</p>
<b>shutdown  </b>	Shutdown this interface.
<b>snmp trap interface-ip   link status  </b>	Configure SNMP traps for interface and link status.
<b>sync-group &lt;WORD&gt;  </b>	<p>Adds this sync VRRP group to a sync group. Sync groups are used to link VRRP groups together in order to propagate transition changes from one group to another group.</p>
<b>sync-group &lt;WORD&gt;  </b>	<p>Assign this interface to a sync group. Adds this sync VRRP group to a sync group. Sync groups are used to link VRRP groups together in order to propagate transition changes from one group to another group. To clarify, in a VRRP synchronization group (“sync group”) are synchronized such that, if one of the interfaces in the group fails over to backup, all interfaces in the group fail over to backup.</p> <p>For example, if one interface on a master router fails,</p> <p><b>Note:</b> VRRP groups in a sync group must have similar priority and preemption configurations. Before enabling a sync-group you should verify that one is master of both groups and the other is backup of both groups. If both side think they are master of the same group, then enabling a sync group can cause endless transitioning to get in sync.</p>
<b>timers &lt;10-255000&gt;  </b>	<p>Configure the time interval between the advertisement packets that are being sent to other Virtual Router Redundancy Protocol (VRRP) routers in the same group</p> <p>Values are 10–255000 milliseconds</p> <p>Default is 1000 milliseconds</p>
<b>version  </b>	<p>Configure the version number.</p> <p>Values are 2–3</p> <p>Default is 3</p>

---

<b>zone-member security</b> <WORD>}	This interface is a member of this zone security.
--	---

---

<b>Command Modes</b>	(config-if-vrrp)#
----------------------	-------------------

---

### Usage Guidelines

Use this command to configure VRRP parameters.

Your switch supports the Virtual Router Redundancy Protocol (VRRP).

VRRP is an election and redundancy protocol that dynamically assigns the responsibility of a virtual router to one of the physical routers on a LAN.

---

This increases the availability and reliability of routing paths in the network. In VRRP, one physical router in a virtual router is elected as the master, with the other physical router of the same virtual router acting as backups in case the master fails. The physical routers are referred to as VRRP routers.

---

The default gateway of a participating host is assigned to the virtual router instead of a physical router. If the physical router is routing packets on behalf of the virtual router fails, another physical router is selected to automatically replace it. The physical router forwarding packets at any given time is called the master router.

### Examples

This example sets VRRP for version 2.

```
(config)#interface ethernet 2
```

```
(config-if)#vrrp 10
```

```
(config-if-vrrp)#version 2
```

---

### Related Commands

*show vrrp*

# 6 Interface line mode

This chapter defines all the CLI commands associated with configuring the console and tty ports. Some CLI commands may not be applicable to your model or running software.

## line

**line** {**console** <0-0> | **tty** | **vty**}

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
{ <b>console</b> <0-0>	Configure console port parameters.
<b>tty</b>	Configure tty port parameters.
<b>vty</b> }	Configure vty port parameters.
<b>Command Modes</b>	>enable >config #line

### Usage Guidelines

Use this command to change to line mode.

### Examples

This example set terminal width to 80.

```
#line vty  
#width 80
```

### Related Commands

[\(config-line\)#tty](#)

[\(config-line\)#vty](#)

### (config-line)#console

{**accounting exec** <WORD> | **default** |  
**authorization exec** <WORD> | **default** |  
**databits** 7 | 8 |  
**exec** |  
**exec-timeout** <0-35791> <0-2147483> |  
**history size** 0-256> |  
**length** 0-512> |  
**login authentication** <WORD> | **default** |  
**parity** even | odd | none |  
**speed** | 115200 | 19200 | 38400 | 57600 | 9600 |  
**stopbits** 1 | 2 |  
**timeout login response** <1-300> |  
**transport output** all | none | ssh | telnet |  
**width** <0-512>}

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>(config-line)#console</b>	
<b>{accounting exec &lt;WORD&gt;   default  </b>	Use an accounting list with a specified name or default list.
<b>authorization exec &lt;WORD&gt;   default  </b>	Use an authorization with a specified name or default list.
<b>databits 7   8  </b>	Type 7 or 8 to set data bits.
<b>exec  </b>	Enables EXEC CLI session
<b>exec-timeout &lt;0-35791&gt; &lt;0-2147483&gt;  </b>	Configure the console session CLI timeout. Values are 0 to 35791 in minutes Default is 5 minutes
<b>history size 0-256&gt;  </b>	Configure the size of the history buffer.
<b>length 0-512&gt;  </b>	Configure the number of lines displayed on the screen. Type 0 for no pausing at end of page.
<b>login authentication &lt;WORD&gt;   default  </b>	Use the specified list for authentication requests or use the default list.
<b>parity even   odd   none  </b>	Configure parity for console mode.
<b>speed   115200   19200   38400   57600   9600  </b>	Set the speed for this interface. <ul style="list-style-type: none"> <li>• 115200</li> <li>• 19200</li> <li>• 38400</li> <li>• 57600</li> <li>• 9600</li> </ul>
<b>stopbits 1   2  </b>	Configure stop bits for console mode.
<b>timeout login response &lt;1-300&gt;  </b>	Configure timeout for user responses during the login sequence.
<b>transport output all   none   ssh   telnet  </b>	Allows the user on the console port to telnet or ssh out of the .
<b>width &lt;0-512&gt;}</b>	Configure the width of the terminal display.

---

<b>Command Default</b>	console 0 timeout login response 30 login authentication default databits 8 parity none stopbits 1 speed 9600
------------------------	---

---

<b>Command Modes</b>	>enable >config #line config 0 (config-line)#
----------------------	--

---

### Usage Guidelines

Use these commands to set parameters for console mode.

---

### Examples

These commands sets your console to speed 38400, databits 7 and stopbits 2.

```
(config-line)#speed 38400
```

```
(config-line)#databits 7
```

```
(config-line)#stopbits 2
```

---

### Related Commands

*(config-line)#tty*

### **(config-line)#tty**

```
{break break-interrupted | local | off | remote |
break-delay <1-65535> |
break-length <1-65535> |
connection-method dial-in | dial-out | dial-in-out | direct-connect | ms-direct-
guest | ms-direct-host |
cts-toggle off | on |
cts-toggle-final-delay <0-1000> |
cts-toggle-inital-delay <0-1000> |
databits 5 | 6 | 7 | 8 |
data-logging off | on |
dial-retries <0-99> |
dial-timeouts <0-99> |
discard-characters-rxd-with-errors off | on |
echo-suppression off | on |
flow both | hard | none | soft |
flowin off | on |
flowout off | on |
full-duplex
```



**half-duplex**

**hotkey-prefix** <0-ff> |  
**idle-timer** <0-4294967> |  
**initiate-connection** any-char | specific-char <0-ff> |  
**internet address** <A.B.C.D> | <X:X:X::X> |  
**keepalive** off | on |  
**line-termination** off | on |  
**lock** off | on |  
**map-cr-crlf** off | on |  
**media-type** [straight | rolled | eia-232 | eia-422 | eia-485 |  
**modbus** [master crlf | entry | protocol] | [slave cflf | protocol | uid-range |  
**modem-init-string** <WORD> |  
**monitor-dsr-dtr** on | off |  
**motd** off | on |  
**multihost entry** <1-49> <A.B.C.D> | <X:X:X::X> port <1-65535> |  
**multisessions** <1-8>]]  
**name** <WORD> |  
**packet-forwarding** delay-between-messages <1-65535> | [enable-end-tigger1 on |  
off] | [enable-end-tigger2 on | off] | [enable-eof1 on | off] | [enable-eof2 on | off] |  
[enable-sof1 on | off] | [enable-sof2 on | off] | end-trigger1 <0-0xff> | end-trigger2  
<0-0xff> | eof1 <0-0xff> | eof2 <0-0xff> | force-transmit-timer <1-65535> |  
[forwarding-rule strip-trigger | trigger | trigger+1 | trigger+2] | idle-timer <1-  
65535> | [mode custom-on-frame-definition | custom-on-specific-events |  
minimize-latency | optimize-network-throughput | prevent-message-  
fragmentation] | packet-size <1-1024> | sof1 <0-0xff> | sof2 <0-0xff> | start-frame-  
transmit off | on]]  
**pages** <1-7> |  
**parity** even | mark | none | odd | space |  
**phone -number** <WORD> |  
**ppp accm** <8 hex digits> | [address-comp on | off] | auth-tmout <1-255> |  
[authentication chap | pap | none] | challenge-interval <0-255> | cr-retry <0-255>  
| cr-timeout <1-255> | [dynamic-dns on | off | hostname | password | username  
<WORD>] echo-retry <0-255> | echo-timeout <0-255> | [ipaddr-neg on | off] |  
**ipv6-global-network-prefix** <WORD> | **ipv6-local-interface** <WORD> | **ipv6-**  
**remote interface** <WORD> | **lipaddr** <A.B.C.D> | magic-neg on | off | mtu <64-  
1500> | [ms-direct host | guest] | nak-retry <0-255> | netmask <A.B.C.D> |  
password <WORD> | [proto-comp off | on] | ripaddr <A.B.C.D> | [roaming-  
callback off | on] | [routing listen | none | send | send-and-listen] | rpassword  
<WORD> | ruser <WORD> | tr-retry <0-255> | tr-timeout <1-255> | user  
<WORD> | vj-comp on | off] |  
**reset** off | on |  
**rev-session-security** off | on |  
**rlogin-client** termtype <WORD> |  
**rts-toggle** off | on |  
**rts-toggle-final-delay** <0-1000> |  
**rts-toggle-inal-delay** <0-1000> |

```

send-name off | on |
send-port-id off | on |
service bidir <A.B.C.D> <I-65535> <I-65535> |
service client-tunnel <A.B.C.D> <I-65535> |
service direct raw <A.B.C.D> | rlogin <A.B.C.D> | ssh <I-65535> | telnet
<A.B.C.D> <I-65535> |
service dslogin |
service modbus-master |
service modbus-slave |
service ppp |
service printer |
service reverse raw [multihost on | off | tcp-port <I-65535> | multihost] | ssh <I-
65535> | telnet <I-65535> |
service server-tunnel <I-65535> | [service silent raw <I-65535> | multihost all |
backup <A.B.C.D> <I-65535> <I-65535> | none |
service slip |
service trueport client-initiated off <A.B.C.D> <I-65535> [multihost all | backup
| none] signal-active off | on] | on <I-65535> [multihost all | backup | none] |
signal-active off | on] |
service udp <I-65535> |
service vmodem <I-65535> |
sess-timer <0-4294967> |
session-strings delay <0-65535> | initiate <WORD> | terminate <WORD> |
slip lipaddr | mtu <A.B.C.D> | netmask <A.B.C.D> | ripaddr <A.B.C.D> routing
listen | none | send | send-and-listen | vj-comp on | off |
speed 115200 | 1200 | 1800 | 19200 | 230400 | 2400 | 28800 | 300 | 38400 | 4800 |
57600 | 600 | 9600 | custom |
ssh-client authentication [dsa on | off] | [keyboard-interactive on|off] | [rsa on |
off] | [compression on | off] | [login on | off] | name <WORD> | password
<WORD> | [ssh-2-cipher-list 3des | aes | aes-ctr | aes-gcm | arcfour | blowfish |
cast | chacha20-poly1305] | strict-host-key-checking on | off | termtype <WORD>
| verbose on | off |
ssl cipher-suite option <I-5> | [encryption 3des | aes | aes-gcm | any | arcfour |
arctwo | des min-key-size 128 | 168 | 256 | 40 | 56 | 64] | [max-key-size 128 | 168 |
256 | 40 | 56 | 64] | [key-exchange adh | any | ecdh-ecdsa | edh-dss | edh-rsa | rsa] |
[hmac any | md5 | sha1 | sha256 | sha384] | [enable on | off] | [type client | server]
| validation-criteria common-name <WORD> | country <WORD> | email
<WORD> | locality <WORD> | organisaton <WORD> | organisation-unit
<WORD> | state-province <WORD> | [verify-peer off | on] | [version any tlsv1 |
tlsv1.1 | tlsv1.2] |
stop-bits 1 | 2 |
telnet-client echo <0-0x7f> | eof <0-0x7f> | erase <0-0x7f> | escape <0-0x7f> | intr
<0-0x7f> | line-mode off | on | local-echo off | on | map-cr-crlf on | off | quit <0-
0x7f> |
termtype ansi | dumb | hp700 | ibm3151te | term1 | term2 | term3 | tvi925 | vt100 |
vt320 | wyse60 |

```

```

tx-driver-control auto | rts |
udp entry <I-4> | both auto-learn <A.B.C.D> | <X:X:X:X::X> specific <I-65535>
<WORD> | in any-port <A.B.C.D> | <X:X:X:X::X> | <A.B.C.D> | <X:X:X:X::X> |
none | out <I-65535> | <A.B.C.D> | <X:X:X:X::X> |
user <WORD> |
vmodem echo off | on | [failure-string <WORD>] | [host <A.B.C.D> |
<X:X:X:X::X>] | [init-string <WORD>] | mode [auto | manual] | port <I-65535> |
response-delay <I-999> | [signals cts always-high | represent-ri] | dcd always-
high | follow-connection | [style numeric | verbose] | success-string <WORD> |
suppress off | on}

```

Use the no form of this command to negate a command or set to defaults.

Syntax	Description
<b>(config-line)#tty</b>	
<b>{break break-interrupted   local   off   remote  </b>	<p>Configure how the break signal is interpreted from the peer.</p> <p>Data Range:</p> <ul style="list-style-type: none"> <li>• None—The ignores the break key completely and it is not passed through to the host.</li> <li>• Local—The deals with the break locally. If the user is in a session, the break key has the same effect as a hot key.</li> <li>• Remote—When the break key is pressed, the translates this into a telnet break signal which it sends to the host machine.</li> <li>• Break Interrupt—On some systems such as SunOS, XENIX, and AIX, a break received from the peripheral is not passed to the client properly. If the client wishes to make the break act like an interrupt key (for example, when the stty options—ignbrk and brkintr are set.</li> </ul> <p>Default is None</p>
<b>break-delay &lt;I-65535&gt;  </b>	<p>This parameter defines the delay between the termination of a a break condition and the time data is sent out the serial port.</p> <p>Default is 0 ms (no delay).</p>

<b>break-length</b> <i>1-65535</i> >	When the receives a command from its peer to issue a break signal, this parameters defines the length of time the break condition is asserted on the serial port Default is 1000ms (1 second)
<b>connection-method</b> <b>dial-in</b>   <b>dial-out</b>   <b>dial-in-out</b>   <b>direct-connect</b>   <b>ms-direct-guest</b>   <b>ms-direct-host</b>	<b>Dial in</b> —Enable this parameter if the device is remote and is dialing via a modem or ISDN TA Default is Disabled <b>Dial out</b> —Enable this parameter if the device if you want the modem to dial a number when the serial port is started. Default is Disabled
<b>cts-toggle</b> <b>off</b>   <b>on</b>	Configure CTS toggle. Default is Off
<b>cts-toggle-final-delay</b> < <i>0-1000</i> >]	Configure CTS final delay in milliseconds. Value is 1–1000
<b>cts-toggle-inital-delay</b> < <i>0-1000</i> >	Configure CTS initial delay in milliseconds. Value is 1–1000
<b>databits</b> <b>5</b>   <b>6</b>   <b>7</b>   <b>8</b>	Configure the data bits for this connection. Data bit options are
<b>data-logging</b> <b>off</b>   <b>on</b>	When enabled, serial data is buffered if the TCP connection is lost. When the TCP connection is re-established, the buffered serial data is sent to its destination. If using the Trueport profile, data logging is only supported in Lite mode. When the data buffer fills, incoming serial data overwrites the oldest data. The minimum data buffer size is 4K. The maximum data buffer size is 256K. <b>Note:</b> A kill line or a reboot of the causes all buffered data to be lost. Some profile features are not compatible with the data logging feature.

<b>dial-retries</b> <0-99>	Configure the number of times the attempts to re-establish a connection with a remote modem. Range is 0–99 Default is 2
<b>dial-timeouts</b> <0-99>	Configure the number of seconds the waits to establish a connection to a remote modem. Range is 1–99 Default is 45 seconds
<b>discard-characters-rxd-with-errors</b> off   on	When enabled, the discards characters received with a parity or framing error. Default is Disabled
<b>echo-suppression</b> off   on	This parameter applies to EIA-485 half-duplex mode, all characters are echoed to the user and transmitted across the serial ports. Some EIA-485 applications require local echo to be enabled in order to monitor the loopback data to determine that line contention has occurred. If your application cannot handle loopback data, echo suppression should be enabled. Default is Off
<b>flow</b> both   hard   none   soft	Configure handling of the data flow. Choose software (soft), hardware (hard), both or none. If you are using SLIP, set to Hard only. If you are using PPP set to either soft or hard (hard is recommended). If you select soft with PPP, you must set the ACCM parameter when you configure PPP for the serial port. Note: For USB ports or RS-422 or RS485 ports the only valid options are none or soft. Default is None
<b>flowin</b> off   on	Configure for flowin control. Default is On
<b>flowout</b> off on	Configure for flowout control. Default is On
<b>full-duplex</b>	Configure the RS-485 connection as full duplex. (separate Tx and Rx differential pairs).

---

<b>half-duplex</b>	Configure the RS-485 connection as half duplex. (same differential pair is used for both Tx and Rx).
<b>hotkey-prefix</b> <0-ff>	<p>Configure the prefix that a user types to lock a serial port or redraw the Menu.</p> <p>Data Range:</p> <ul style="list-style-type: none"> <li>• ^a l—(Lowercase L) Locks the serial port until the user unlocks it.</li> </ul>
	<ul style="list-style-type: none"> <li>• ^a l—(Lowercase L) Locks the serial port until the user unlocks it. The user is prompted for a password (any password, excluding spaces) and locks the serial port. Next, the user must retype the password to unlock the serial port.</li> <li>• ^r—When you switch from a session back to the Menu, the screen may not be redrawn correctly. If this happens, use this command to redraw it properly. This is always Ctrl R, regardless of the Hot Key prefix.</li> </ul> <p>You can use the Hotkey Prefix to lock a serial port only when the Allow Port Locking parameter is enabled.</p> <p>Default is hexadecimal 01 (Ctrl-a, ^a)</p>
<b>idle-timer</b> <0-4294967>	<p>Configure the inactivity timer to close a connection due to inactivity. When the idle timeout expires, the ends the connection.</p> <p>Range is 0–4294967 seconds (about 49 days)</p> <p>Default is 0 seconds so the port never times out.</p>
<b>initiate-connection any-char   specific-char</b> <0-ff>	<p>Configure the initiate a connection parameter</p> <ul style="list-style-type: none"> <li>• Initiates a connection to the specified host when any data is received on the serial port.</li> <li>• Initiates a connection to the specified host only when the specified character is received on the serial port. Default is Disabled</li> </ul> <p>Default is Disabled</p>
<b>internet address</b> <A.B.C.D>   <X:X:X::X>	Configure the Internet address of this serial port.

<b>keepalive off   on  </b>	Configure the TCP keepalive option. This parameter is used in conjunction with the Monitor Connection Status Interval parameter found under config <i>serial</i> .
	The connection is monitored based on the monitor connection status interval timer. This timer specifies the inactivity period before "testing" the connection. Should the end device not respond, the connection will be dropped. Note: If a network connection is accidentally dropped, it can take as long as the specified interval before reconnecting to the serial port. Default is Off
<b>line-termination off   on  </b>	Only available on a "multi-protocol" module and when running the port in RS-485, half duplex mode. When enabled, will put a 120Ohm resistance between the differential pairs. This should only be done on end points of the 485 line. Default is Off.
<b>lock off   on  </b>	When enabled, the user can lock his terminal with a password using the hotkey prefix (ctrl-a) ^a (lowercase L). The prompts the user for a password and a confirmation. Default is Off.
<b>map-cr-crlf off   on  </b>	Configure to map carriage returns (CR) to carriage return line feed (CRLF). Default is off
<b>media-type [straight   rolled]</b>	When using RS-232, you can set the IOLAN port to act as a DCE or a DTE. Select "straight" if you want the port to act as a DCE. Select "rolled" if you want the port to act as a DTE. Default is straight
<b>media-type [eia-232   eia-422   eia-485]</b>	Select the electrical interface you will be using. Default is eia-232
<b>modbus [master crlf   entry   protocol]   [slave cflf   protocol   uid-range]  </b>	Configure Modbus master/ slave parameters. Default is enabled

<b>modem-init-string</b> <i>&lt;WORD&gt;</i>	Configure the initialization string to send to the modem.
<b>monitor-dsr-dtr</b> on   off	Configure monitor for dsr-dtr signals.
<b>motd</b> off   on	Configure enables/disables the message of the day. Default is Disabled
<b>multihost entry</b> <i>&lt;1-49&gt;</i> <i>&lt;A.B.C.D&gt;</i>   <i>&lt;X:X:X::X&gt;</i> port <i>&lt;1-65535&gt;</i>	Adds a multihost entry to the multihost table. Range 1 to 49 Port number 1 to 65535
<b>multisessions</b> <i>&lt;1-8&gt;</i>	Configure the number of extra network connections available on a serial port, in addition to the single session that is always available. Enabling multisessions permits multiple users to monitor the same console port. Range is 1 to 8 Default is 0
<b>name</b> <i>&lt;WORD&gt;</i>	Configure a name.
<b>packet-forwarding delay-between-messages</b> <i>&lt;1-65535&gt;</i>   [enable-end-tigger1 on   off]   [enable-end-tigger2 on   off]   [enable-eof1 on   off]   [enable-eof2 on   off]   [enable-soft1 on   off]   [enable-soft2 on   off]   end-trigger1 <i>&lt;0-0xff&gt;</i>   end-trigger2 <i>&lt;0-0xff&gt;</i>   eof1 <i>&lt;0-0xff&gt;</i>   eof2 <i>&lt;0-0xff&gt;</i>   force-transmit-timer <i>&lt;1-65535&gt;</i>   [forwarding-rule strip-trigger   trigger   trigger+1   trigger+2]   idle-timer <i>&lt;1-65535&gt;</i>   [mode custom-on-frame-definition   custom-on-specific-events   minimize-latency   optimize-network-throughput   prevent-message-fragmentation]   packet-size <i>&lt;1-1024&gt;</i>   soft1 <i>&lt;0-0xff&gt;</i>   soft2 <i>&lt;0-0xff&gt;</i>   start-frame-transmit off   on	Configure packet forwarding rules. The packet is transmitting on the first criteria that is met.  For example, if you set a force transmit timer of 1000 ms and a packet size of 100 bytes whichever criteria is first causes the packet to be transmitted.  Default is Disabled



<b>pages</b> <1-7>	Configure the number of video pages the terminal supports. Range: 1 to 7 Default is 5 pages
<b>parity</b> even   mark   none   odd   space	Configure the parity type. Data Options are: <ul style="list-style-type: none"> <li>• Even</li> <li>• Odd</li> <li>• Mark</li> <li>• space</li> <li>• none</li> </ul>
<b>phone-number</b> <number>	Configure the phone number to use when Dial Out is enabled.
<b>ppp acm</b> <8 hex digits>   [ <b>address-comp</b> on   off]   <b>auth-tmout</b> <1-255>   [ <b>authentication chap</b>   pap   none]   <b>challenge-interval</b> <0-255>   <b>cr-retry</b> <0-255>   <b>cr-</b>	Configure PPP parameters. <b>SLIP</b> —The IPv4 address of the end of the SLIP link. For routing to work you must enter an IP address in this field. Choose an address that is part of the same network or subnetwork as the remote end; for example, if the remote end is address
<b>timeout</b> <1-255>   [ <b>dynamic-dns</b> on   off hostname   <b>password</b>   <b>username</b> <WORD>] <b>echo-retry</b> <0-255>   <b>echo-timeout</b> <0-255>   [ <b>ipaddr-neg</b> on   off]   <b>ipv6-global-network-prefix</b> <WORD>   <b>ipv6-local-interface</b> <WORD>   <b>ipv6-remote interface</b> <WORD>   <b>lipaddr</b> <A.B.C.D>   <b>magic-neg</b> on   off   <b>mtu</b> <64-1500>   [ <b>ms-direct</b> host   guest]   <b>nak-retry</b> <0-255>   <b>netmask</b> <A.B.C.D>   <b>password</b> <word>   [ <b>proto-comp</b> off   on]   <b>ripaddr</b> <A.B.C.D>   [ <b>roaming-callback</b> off   on]   [ <b>routing</b> listen   none   send   send-and-listen]   <b>rpassword</b> <WORD>   <b>ruser</b> <WORD>   <b>tr-retry</b> <0-255>   <b>tr-timeout</b> <1-255>   <b>user</b> <WORD>   <b>vj-comp</b> on   off	192.101.34.146, your local IP address can be 192.101.34.145. Do not use the (main) IP address in this field; if you do so, routing does not take place correctly. <b>MTU</b> —The Maximum Transmission Unit (MTU) parameter restricts the size of individual SLIP packets being sent by the . Enter a value between 256 and 1500. The default value is 256. If your user is authenticated by Radius, this value is overwritten when you have set a Framed MTU in the RADIUS server.

<b>reset off   on  </b>	When enabled, resets the terminal definition connected to the serial port when a user logs out. Default is Disabled
<b>rev-session-security off   on  </b>	Configure reverse telnet session authentication.
<b>rlogin-client termtype &lt;WORD&gt;  </b>	Configure the terminal type for rlogin sessions.
<b>rts-toggle off   on  </b>	Configure RTS toggle. Default is Off
<b>rts-toggle-final-delay &lt;0-1000&gt;  </b>	Configure RTS final delay in milliseconds. Value is 1–1000
<b>rts-toggle-inital-delay &lt;0-1000&gt;  </b>	Configure RTS initial delay in milliseconds. Value is 1–1000
<b>send-name off   on  </b>	Configure the port name to be sent to the host when session is initiated. This is done before any other data is sent or received to/from the host. Default is Disabled
<b>send-port-id off   on  </b>	Configure port-id to send.
<b>service bidir &lt;A.B.C.D&gt; &lt;1-65535&gt; &lt;1-65535&gt;  </b>	Configure service type for bidir. Use bidir for TCP Sockets, Reverse and Silent connections. Configure the host to connect to, server port number and host port number.
<b>service client-tunnel &lt;A.B.C.D&gt; &lt;1-65535&gt;  </b>	Configure service type to client-tunnel. Configure the Enter the host to connect to and host port number.
<b>service direct raw &lt;A.B.C.D&gt;   rlogin &lt;A.B.C.D&gt;   ssh &lt;1-65535&gt;   telnet &lt;A.B.C.D&gt; &lt;1-65535&gt;  </b>	Configure service type as direct raw.
<b>service dslogin  </b>	Connects to the serial port in Command Line Interface (CLI) mode on this port.
<b>service modbus-master  </b>	Configure service type as modbus master.
<b>service modbus-slave  </b>	Configure service type as modbus slave.

<code>service ppp  </code>	Configure service type as PPP for this serial port.
<code>service printer  </code>	Configure service type as printer.
<code>service reverse raw [multihost on   off   tcp-port &lt;1-65535&gt;   multihost]   ssh &lt;1-65535&gt;   telnet &lt;1-65535&gt;  </code>	Configure parameters for a reverse raw connection.
<code>service server-tunnel &lt;1-65535&gt;  </code>	Configure service to server tunnel connection.
<code>service silent raw &lt;1-65535&gt;   multihost all   backup &lt;A.B.C.D&gt; &lt;1-65535&gt; &lt;1-65535&gt;   none  </code>	<p>Configure service type as silent raw parameters.</p> <p><b>Multihost</b>—used for connections coming from the network to the serial port for Trueport or Raw. Multihost all allows multiple hosts to connect to the serial device.</p> <p><b>Backup</b>—Used for connections going from the serial port to the network for Trueport or Silent Raw services, allows the serial port to communicate to either all the hosts in the multi-host list or a primary/backup host.</p>
<code>service slip  </code>	Configure service type as slip.
<code>service trueport client-initiated off &lt;A.B.C.D&gt; &lt;1-65535&gt; [multihost all   backup   none] signal-active off   on]   on &lt;1-65535&gt; [multihost all   backup   none]   signal-active off   on]  </code>	Configure service type as trueport.
<code>service udp &lt;1-65535&gt;  </code>	Configure service type as udp.
<code>service vmodem &lt;1-65535&gt;  </code>	Configure service type as modem.
<code>sess-timer &lt;0-4294967&gt;  </code>	<p>Configure session timer to forcibly close the session/connection when the Session Timeout expires.</p> <p>Default is 0 seconds so that the port never timeouts.</p> <p>Range is 0 to 294967 seconds (about 49 days)</p>

---

**session-strings delay**<0-65535> | **initiate** <WORD> | **terminate** <WORD> |

Configure session string delay options.

**Delay after Send**—If configured, a delay time is sent to the device. This delay is used to provide the serial device time to process the string before the session is initiated.

**Initiate at Start**—If configured, this string is sent to the serial device on the power-up of the or when a kill line command is issued on this serial port. If the "monitor DSR" or "monitor DCD" options are set, the string is also sent when the monitored signal is raised.

**Range is** 0–127 alpha-numeric characters. Non printable ascii characters must be entered in this format <027>. The decimal numbers within the brackets must be 3 digits long (example 003 not 3)

**Send at Terminate**—If configured, this string is sent to the serial device when the TCP session on the LAN is terminated. If multi-host is configured, this string is only sent in listen mode to the serial device when all multi-host connections are terminated.

---

**Range is** 0–127 alpha-numeric characters. Non printable ascii characters must be entered in this format <027>. The decimal numbers within the brackets must be 3 digits long (example 003 not 3)

---

**slip lipaddr** | **mtu** <A.B.C.D> | **netmask** <A.B.C.D> | **ripaddr** <A.B.C.D> | **routing listen** | **none** | **send** | **send-and-listen** | **vj-comp on** | **off**

Configure SLIP parameters.

<b>speed</b> 115200   1200   1800   19200   230400   2400   28800   300   38400   4800   57600   600   9600   custom	Configure the speed for this interface. <ul style="list-style-type: none"> <li>• 115200</li> <li>• 1200</li> <li>• 1800</li> <li>• 19200</li> <li>• 230400</li> <li>• 2400</li> <li>• 28800</li> <li>• 300</li> <li>• 38400</li> <li>• 4800</li> <li>• 57600</li> <li>• 600</li> <li>• 9600</li> <li>• custom</li> </ul>
<b>ssh-client authentication</b> [dsa on   off]   [keyboard-interactive on off]   [rsa on   off]   [compression on   off]   [login on   off]   name <WORD>   password <WORD>   [ssh-2-cipher-list 3des   aes   aes-ctr   aes-gcm   arcfour   blowfish   cast   chacha20-poly1305]   strict-host-key-checking on   off   termtype <WORD>   verbose on   off	Configure SSH client parameters.
<b>ssl</b> [cipher-suite   enable   type   validation-criterial   verify-peer  version]	Enables or disables SSL
<b>enable</b> on   off	Enables or disables SSL
<b>type</b> client   server	Select mode for SSL <ul style="list-style-type: none"> <li>• client</li> <li>• server</li> </ul>
<b>verify-peer</b> off   on	Configure for peer validation.
<b>version</b> any tlsv1   tlsv1.1   tlsv1.2	Configure TLSV version.

---

**stop-bits 1 | 2 |**

Configure the stop bits.

- 1
- 2

---

**telnet-client echo <0-0x7f> | eof <0-0x7f> | erase <0-0x7f> | escape <0-0x7f> | intr <0-0x7f> | line-mode off | on | local-echo off | on | map-cr-crlf on | off | quit <0-0x7f> | termtype <WORD> |**

**echo**—toggles between local echo of entered characters and suppressing local echo. Local echo is used for normal processing, while suppressing the echo is convenient for entering text that should not be displayed on the screen, such as passwords. This parameter can be used only when Enable Line mode is enabled.

Default is Disabled

**eof**—Defines the end-of-file character. When enabled Line mode is enabled, entering the EOF character as the first character on a line sends the character to the remote host.

This value is in hexadecimal.

Default is 4 (ASCII value ^D)

This parameter can be used only when Enable Line mode is enabled.

Default is Disabled

**erase**—Defines the erase character. When Line mode is off, typing the erase character erases one character.

This value is in hexadecimal.

Default is 8 (ASCII value ^H)

**escape**—Defines the escape character. Returns you to the command line mode.

This value is hexadecimal.

Default is 1d (ASCII value GS)

**line mode**—When enabled, keyboard input is not sent to the remote host until Enter is pressed, otherwise input is sent every time a key is pressed.

Default is Disabled

	<p><b>local echo</b>—Toggles between local echo of entered character and suppressing local echo. Local echo is used for normal processing, while suppressing the echo is convenient for entering text that should not be displayed on the screen such as passwords.</p> <p>This parameter can only be used when Enable Line Mode is enabled. Default is Disabled</p> <p><b>map cr to crlf</b>—When enabled, maps carriage return (CR) to carriage return/line feed (CR/LF). Default is Disabled</p> <p><b>quit</b>—defines the quit character. Typing the quit character closes and exits the current telnet session.</p> <p>This value is in hexadecimal. Default is 1c (ASCII value FS)</p>
<pre>termtype ansi   dumb   hp700   ibm3151te   term1   term2   term3   tvi925   vt100   vt320   wyse60  </pre>	<p>Configure a terminal type.</p>
<pre>udp entry &lt;1-4&gt;   [both   in   out   none]   auto-learn &lt;A.B.C.D&gt;   &lt;X.X.X.X::X&gt; specific &lt;1-65535&gt; &lt;A.B.C.D&gt;   &lt;X.X.X.X::X&gt;   in any-port &lt;A.B.C.D&gt;   &lt;X.X.X.X::X&gt; &lt;A.B.C.D&gt;   &lt;X.X.X.X::X&gt;   none   out &lt;1-65535&gt; &lt;A.B.C.D&gt;   &lt;X.X.X.X::X&gt;  </pre>	<p>Configure a udp entry— For each entry you specify a different IP address range, udp port, and the direction of data flow.</p> <p><b>both   in   out   none</b></p> <p>The direction in which information is received or relayed:</p> <p><b>both</b>—both directions</p> <p><b>in</b>—LAN to serial. The listens on the port value configured in the DS Port parameter for messages coming from the learned or configured port.</p>

	<p><b>out</b>—Serial to LAN. The forwards data received on the serial port to the IP address range, UDP port configured for this entry.</p> <p><b>none</b>—UDP service not enabled.</p> <p><b>auto-learn</b>—The only listens to the first port that it receives a UDP packet from. Auto learn is applicable when direction is set to In or Both.</p> <p><b>any-port</b>—The receives messages from any port sending UDP packets Applicable when direction is set to In.</p> <p><b>specific</b>—The port that the</p> <p><b>&lt;start_IP_address&gt;</b> The first host IP address in the range of IP addresses (for IPV4 or IPV6) that the listens for messages from and/or send messages to.</p> <p><b>&lt;end_IP_address&gt;</b> The last host IP address in the range of IP addresses (for IPV4, not required for IPV6) that the listens for messages from and/or send messages to.</p>
<p><b>user</b> <i>&lt;WORD&gt;</i>  </p>	<p>Configure a user name.</p>
<p><b>vmodem echo</b> off   on]    <b>[failure-string</b> <i>&lt;WORD&gt;</i>]    <b>[host</b> <i>&lt;A.B.C.D&gt;</i>    <i>&lt;X:X:X:X::X&gt;</i>]   <b>[init-string</b>  <i>&lt;WORD&gt;</i>   <b>mode</b> [auto    manual]   <b>port</b> <i>&lt;1-65535&gt;</i>    <b>response-delay</b> <i>&lt;1-999&gt;</i>    <b>[signals</b> cts always-high    represent-ri]   <b>dcd</b> always-high    follow-connection]   <b>[style</b>  numeric   verbose]   <b>success-</b>  <b>string</b> <i>&lt;WORD&gt;</i>   <b>suppress</b> off    on}</p>	<p><b>echo</b>—Configure echoes to have the terminal echo back typed characters. (equivalent to ATE0/ATE1 commands). Disabled by default</p> <p><b>failure String</b>—Configure the string sent to the serial device when a connection fails. If no string is entered, the string NO CARRIER is sent.</p> <p><b>host</b>—Configure the target host name.</p> <p><b>init-string</b>—Configure additional vmodem commands that affects how vmodem starts. The following commands are supported: ATQn, ATVn, ATEn, ATS0, AT&amp;Z1, AT&amp;Sn, AT&amp;Rn, AT&amp;Cn, AT&amp;F, ATS2, ATS12, and ATDS1.</p>



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See *VModem Initialization Commands* in the *Router's User's Guide* for a more detailed explanation of the supported initialization commands.

**mode**—Configure auto mode to establish the connection when the line becomes active. You must supply the AT command or phone number to start the connection.

**port**—Configure the port number the target host is listening on for messages.

**response-delay**—The amount of time, in milliseconds, before an AT response is sent to the requesting device. The default is 250 ms.

**signals dcd**

Controls the state of the DCD signal.

- **always-high**—DCD signal always stays high
- **follow-connection**—DCD signal is high when an end to end connection is established and low when it is not

Since the does not have a physical DCD pin, you need to re-map the DTR or RTS signal to DCD to have the signal present. (see next option).

**signals dtr**—You can specify how the DTR signal pin acts during your modem application connection, as itself (DTR), as DCD, or as RI.

**signals rts**—You can specify how the RTS signal pin acts during your modem application connection, as itself (RTS), as DCD, or as RI.

**style**

One of the following:

- **Verbose**—Return codes (strings) are sent to the connected device.
- **Numeric**—The following characters are sent to the connected device:
  - 0 OK
  - 1 CONNECTED

- 2 RING
- 3 NO CARRIER
- 4 ERROR
- 6 INTERFACE DOWN
- 7 CONNECTION REFUSED
- 8 NO LISTENER

**success-string**

String that is sent to the serial device when a connection succeeds. If no string is entered, then the string CONNECT is sent with the connecting speed. For example CONNECT 9600

- **suppress**  
When enabled, the connection success/failure indication strings are sent to the connected device, otherwise, these indications are suppressed.  
The default is Disabled

**Command Modes**

(config-line)#

**Usage Guidelines**

Use this command to configure line tty parameters.

**Examples**

This example disables CLI mode for tty .  
(config)#tty mode disable

**Related Commands***(config-line)#console**(config-line)#tty***(config-line)#vty**

{**accounting exec** <WORD> | **default** | **authorization exec** <WORD> | **default** | | **exec-timeout** <0-35791> <0-2147483> | **history size** 0-256 | **length** 0-512 | **login** <WORD> **default** | **width** <0-512>}

Use the no form of this command to negate a command or set to defaults.

**Syntax Description****(config-line)#vty**

**accounting exec** <WORD> |  
**default** |

Configure accounting parameters.

**authorization exec** <WORD> |  
**default** ] |

Configure authorization parameters.

---

<b>exec-timeout</b> <0-35791> <0-2147483>	Configure the time in minutes and seconds for CLI to timeout on the vty session.
<b>history size</b> <0-256>	Configure the size of the history buffer.
<b>length</b> <0-512>	Configure the number of lines displayed on the screen. Type 0 for no pausing at end of page.
<b>login</b> <WORD> default	Configure login authentication parameters.
<b>width</b> <0-512> }	Configure terminal screen width.

---

### Command Modes

>enable  
>config  
(config)#line vty  
(config-line)#

---

### Usage Guidelines

Configure vty line parameters.

---

### Examples

Configure the terminal width to 132.

```
config)#line vty
(config-line)#width 132
```

---

### Related Commands

*(config-line)#tty*  
*(config-line)#console*