Chapter 16

Ping Polling of Device Reachability

Introduction

Ping polling lets the router regularly check whether it can reach a device. You can then configure a trigger to activate on the router when the device becomes unreachable. While the device is unreachable, the router continues to monitor the device's reachability, and you can configure another trigger to activate when the device becomes available again. For example, the first trigger's script could open and configure an alternative link if the device at the other end of a preferred link became unavailable. The second trigger's script would automatically return traffic to the preferred link as soon as it was available again.

Configuring Ping Polling

To determine the device's reachability, the router regularly sends ICMP Echo Request packets ("pings") to the device. As long as the router receives ping responses from the device, it considers the device to be reachable. After the router has not received a reply to a set number of ICMP Echo Requests, it considers the device to be unreachable. It continues to try to ping the device, at an increased rate. After it receives a set number of responses, it considers the device to be reachable again.

By default, the router sends a ping every 30 seconds as long as it is receiving replies. When a reply is not received, the router increases the frequency at which it polls the device (by default, to sending a packet every 1 second). The router maintains this higher rate of polling until it has received sufficient consecutive replies (by default, 30). All these defaults can be changed.

On some operating systems, some servers may respond to a ping even if no other functionality is available, and therefore remain in an Up state while malfunctioning.

Configuring the router to determine a device's reachability and respond to changes in reachability involves the following steps:

■   Create a polling instance to periodically ping the device

■   Create scripts to run when the device becomes unreachable and when it becomes reachable again

■   Configure triggers to run these scripts.

To create a polling instance, use the command:

```
add ping poll=poll-id ipaddress={ipadd|ipv6add[%interface]}
    [criticalinterval=1..65535]
    [description=poll-description] [failcount=1..100]
    [length=4..1500] [normalinterval=1..65535]
    [samplesize=1..100] [sipaddress={ipadd|ipv6add}]
    [timeout=1..30] [upcount=1..100]
```

poll-id is a number from 1 to 100, and identifies the polling instance in the trigger commands and in other ping poll commands. The router can poll up to 100 IP addresses at once.

The **ipaddress** parameter specifies the IP address of the device whose reachability you want to determine.
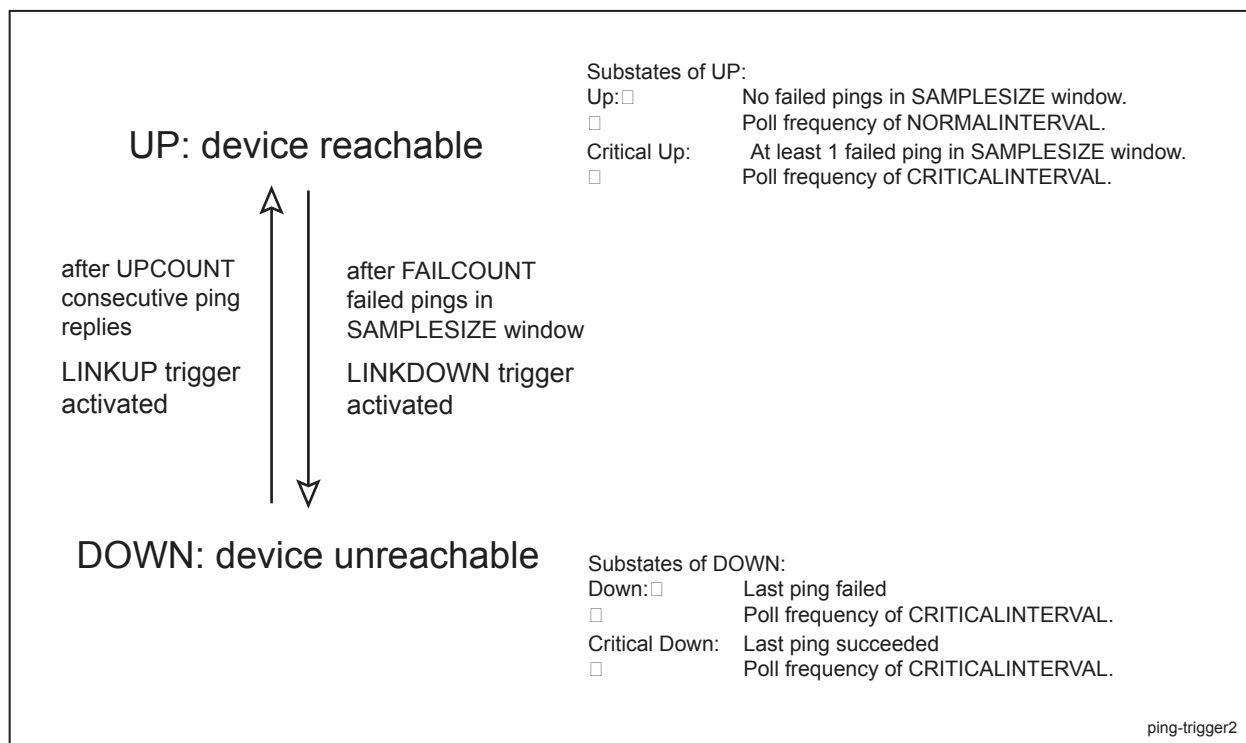
The **normalinterval** parameter specifies the time period between pings when the device is reachable. By default, this is set to 30 seconds. The **criticalinterval** parameter specifies the time period between pings when the router has not received a reply to at least one ping and when the device is unreachable. The default is 1 second. The **criticalinterval** enables the router to quickly observe changes in the state of the device, and should be set to a much lower value than the **normalinterval**.

The number of pings that the router examines to consider a change in state is controlled by three parameters: **failcount**, **samplesize**, and **upcount**. The **failcount** is the number of pings that must be unanswered for the router to consider the device unreachable. The default is 5.

The **samplesize** is the total number of pings within which the **failcount** number of pings must be unanswered. If **samplesize** and **failcount** are the same, the unanswered pings must be consecutive. If **samplesize** is greater than **failcount**, a device that does not always reply to pings may be declared unreachable. By default, **samplesize** is equal to **failcount**.

The **upcount** is the number of consecutive pings that must be answered for the router to consider the device reachable again. The default is 30. The interaction between these parameters is shown in Figure 16-1 on page 16-3.

Figure 16-1: The interaction between states and parameters for ping polling.

After you have configured the ping polling instance, specify a script or scripts to run when the device becomes unreachable by using the command:

```
create trigger=trigger-id module=ping event=devicedown
    poll=poll-id script=filename... [other-options...]
```

Then specify a script or scripts to run when the device becomes reachable again by using the command:

```
create trigger=trigger-id module=ping event=deviceup
    poll=poll-id script=filename... [other-options...]
```

where *filename* is the name of the script file and has an SCP extension. For more information, see Triggers on page 4. For information about creating scripts, see Chapter 34, Scripting.

If you use these triggers to open a backup link to a remote device in the event of the primary link failing (rather than the remote device failing), the backup link and primary link must point to different IP addresses on the remote device. Otherwise, when the backup link points to the IP address that the router is polling, the router receives ping replies through the backup link, considers the device to be reachable again, and attempts to reopen the primary link instead of using the backup link.

Finally, enable the polling instance by using the command:

```
enable ping poll=poll-id
```

Ping polling is available for IP and IPv6 (ICMP and ICMP6 Echo Request and Reply packets), not for IPX, AppleTalk or OSI.

Triggers

The Trigger Facility automatically runs specific command scripts when particular triggers are activated. When a trigger is activated by an event, parameters specific to the event are passed to the script that is run. For a full description of the Trigger Facility, see Chapter 30, Trigger Facility.

To create or modify a ping polling trigger, use the commands:

```
create trigger=trigger-id module=ping event={devicedown|
    deviceup} poll=poll-id [after=hh:mm] [before=hh:mm]
    [date=date|days=day-list] [name=name] [repeat={yes|no|
    once|forever|count}] [script=filename...] [state={enabled|
    disabled}] [test={yes|no|on|off|true|false}]

set trigger=trigger-id [module] [poll=poll-id] [after=hh:mm]
    [before=hh:mm] [date=date|days=day-list] [name=name]
    [repeat={yes|no|once|forever|count}] [test={yes|no|on|
    off|true|false}]
```

This section lists:

■ The value you need to specify for the **module** parameter (of the **create trigger** command), to identify ping polling

■ The events you may specify in the **event** parameter for ping polling

■ The parameters you may specify as module-specific parameters for ping polling

■ The arguments passed to the script that is activated by the trigger.

Module To identify ping polling in trigger commands use the parameter **module={ping|58}**.

Event DEVICEDOWN

Description The ping poll specified for this trigger has determined that the polled device has become unreachable.

Parameters The following command parameter can be specified in the **create**/**set trigger** commands.

Parameter	Description
POLL=*poll-id*	The ID number of the ping poll to which this trigger relates.

Script Arguments The trigger passes the following argument to the script:

Argument	Description
%1	The ID number of the ping poll to which this trigger relates.

Event DEVICEUP

Description The ping poll specified for this trigger has determined that the polled device has become reachable.

Parameters The following command parameter can be specified in the **create**/**set trigger** commands.

Parameter	Description
POLL=*poll-id*	The ID number of the ping poll to which this trigger relates.

Script Arguments The trigger passes the following argument to the script:

Argument	Description
%1	The ID number of the ping poll to which this trigger relates.

Example To create trigger 1 that activates whenever the ping poll with the ID of 3 determines that the polled device is unreachable, initiating the script RESPONSE.SCP, use the command:

```
create trigger=1 module=ping event=devicedown poll=3
    script=response.scp
```

Logging

Log messages are generated when a device is determined to be unreachable, and when it becomes reachable again. These messages have a severity of 3 (INFO). To view the log messages, use the command:

```
show log module=ping
```

Interaction with Other Protocols

Ping polling does not work if the polled device, this router, or any intermediate routers or switches are configured to drop ICMP Echo Requests and Replies.

Ping and Traceroute

Ping and Traceroute are not affected by ping polling. You can enter **ping** and **trace** commands at any time and independent of the polling.

Firewalls

By default, the router's firewall implementation processes ICMP Echo Requests and Replies sourced from or destined for the IP address of one of the router's interfaces. If you have disabled this for a policy that the interface is attached to, the router does not send ICMP Echo Requests over an interface. The command that disables ICMP Echo messages is:

```
disable firewall policy=policy ping
```

To re-enable ping processing, use the command:

```
enable firewall policy=policy ping
```

The firewalls on all intermediate routers and switches must also be configured to allow pings. By default, the firewall on Allied Telesyn routers and Layer 3 switches does not forward pings between devices on each side of the firewall. To enable this, use the command:
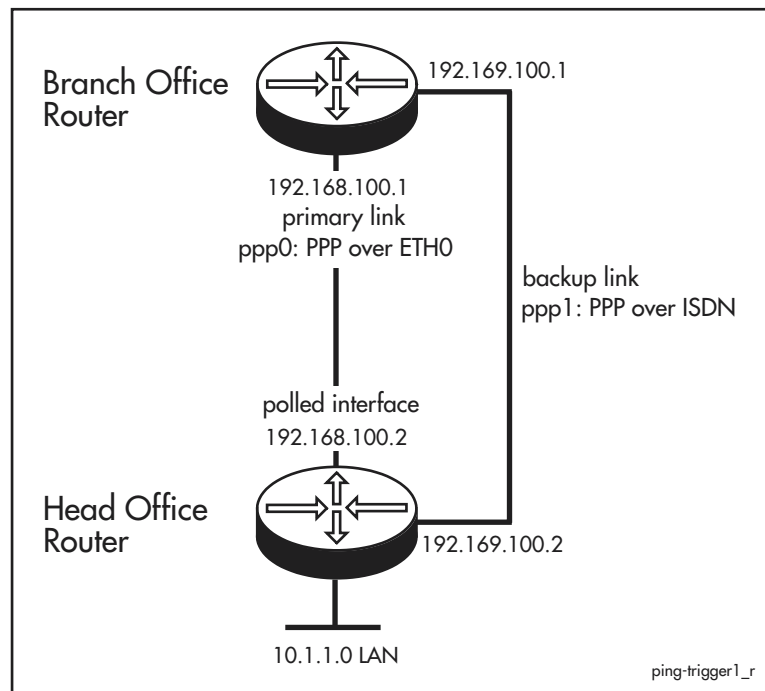
```
enable firewall policy=policy icmp_forwarding=ping
```

Configuration Example

In this example, the router is a branch office router and is connected to a head office router via a PPPoE primary link. If the PPPoE link goes down, a backup link is available over ISDN. The PPPoE link connects the branch office router to the IP address 192.168.100.2 on the head office router, so the router polls this IP address to determine the state of the PPPoE link. The Branch Office has access to the 10.1.1.0 LAN at the Head Office.

This example assumes that an Ethernet port on the router is connected to a device (for example, a cable modem) to supply the PPPoE link, and that the router has a configured PRI or BRI interface. It shows the branch office router's configuration, not the configuration required for the head office router.

Figure 16-2: Example configuration for ping polling.

To configure ping polling on the branch office router

1. **Enable IP**

   ```
   enable ip
   ```

2. **Create the primary link**

   Create a PPPoE interface and give it an IP address. Give it a route to the LAN at the head office end of the PPP link.

   ```
   create ppp=0 over=eth0-any

   add IP interface=ppp0 ipaddress=192.168.100.1

   add IP route=10.1.1.0 interface=ppp0 nexthop=0.0.0.0
   ```

3. **Create the backup link**

    Configure an ISDN call to the number 3456789, and a second PPP interface over that ISDN call.

    For ISDN, also ensure that your *router*'s territory is set correctly by using the **set system territory** command.

    ```
    add isdn call=backup precedence=in number=3456789 inany=on

    create ppp=1 over=isdn-backup idle=3600 lor=on

    add IP interface=ppp1 ip=192.169.100.1
    ```

4. **Save the configuration**

    Save the configuration and set the router to use it on restart.

    ```
    create config=ping-poll.cfg

    set config=ping-poll.cfg
    ```

5. **Create the polling instance**

    Create a polling instance to check the reachability of the interface on the head office router that has the IP address 192.168.100.2. This checks that the ppp0 link is up.

    ```
    add ping poll=1 ipaddress=192.168.100.2
    ```

6. **Create a script to trigger when the device becomes unreachable**

    Create a script to activate the ISDN call. Call the script (for example) linkdown.scp. Include the following command in the script:

    ```
    add ip route=10.1.1.0 interface=ppp1 nexthop=0.0.0.0

    activate isdn call=backup
    ```

7. **Create a script to trigger when the device becomes reachable again**

    Create a script to deactivate the ISDN call. Call the script (for example) linkup.scp. Include the following command in the script:

    ```
    deactivate isdn call=backup

    delete ip route=10.1.1.0 interface=ppp1 nexthop=0.0.0.0
    ```

8. **Create triggers to activate these scripts**

    Create a trigger to activate when the device becomes unreachable.

    ```
    create trigger=1 module=ping event=devicedown poll=1
        script=linkdown.scp
    ```

    Create a second trigger to activate when the device becomes reachable again.

    ```
    create trigger=2 module=ping event=deviceup poll=1
        script=linkup.scp
    ```

9. **Enable the polling instance**

    ```
    enable ping poll=1
    ```

Command Reference

This section describes the commands available to configure and manage ping polling on the router.

The shortest valid command is denoted by capital letters in the Syntax section. See "Conventions" on page xcv of Preface in the front of the Software Reference for details of the conventions used to describe command syntax. See Appendix A, Messages for a complete list of messages and their meanings.

add ping poll

Syntax
```
ADD PING POLl=poll-id IPaddress={ipadd|
    ipv6add[%interface]} [CRIticalinterval=1..65535]
    [DESCription=poll-description] [FAIlcount=1..100]
    [Length=4..1500] [NORmalinterval=1..65535]
    [SIPAddress={ipadd|ipv6add}] [TIMEOut=1..30]
    [UPCount=1..100] [SAMplesize=1..100]
```

where:

■ *poll-id* is an integer from 1 to 100

■ *ipadd* is an IP address in dotted decimal notation.

■ *ipv6add* is a valid IPv6 address.

■ *interface* applies to a request to ping an IPv6 link-local address, and is the interface the ping request is sent (e.g. eth0)

■ *poll-description* is a character string 1 to 32 characters long. Valid characters are any printable character. If the string includes spaces, it must be in double quotes.

Description
This command adds a new polling instance. The specified IP address is polled with ICMP Echo Requests (pings) to determine whether it is reachable at the intervals specified by the **normalinterval** and **criticalinterval** parameters. Figure 16-1 on page 16-3 shows the interaction between the polling interval, the device's state and the **failcount**, **samplesize**, and **upcount** parameters. Polling instances are disabled by default and must be enabled with the **enable ping poll** command.

The **poll** parameter specifies the ID of the new polling instance.

The **ipaddress** parameter specifies the address of the device to be polled. To poll an IPv6 link-local address, you must supply interface information as well as the address because a single link-local address can belong to several interfaces. To poll a link-local address, specify the router's interface where ping requests will be sent, as well as the destination address (see the *Internet Protocol Version 6 (IPv6)* chapter of the Software Reference for a diagram of this interface). An example of the syntax for specifying an IPv6 link local address is `fe80::7c27%eth0`.

The **criticalinterval** parameter specifies the time in seconds between pings when the router has not received one or more reply packets, or the polled device is considered to be unreachable. It enables the router to quickly observe changes in the state of the device, and should be set to a much lower value than the **normalinterval** parameter. The default for **criticalinterval** is 1 second.

The **description** parameter specifies a string that describes the polling instance. The description allows the polling instance to be recognised easily, and is optional.

The **failcount** parameter specifies the number of pings that must be unanswered, within the total number of pings specified by the **samplesize** parameter, for the router to consider the device unreachable. If **samplesize** and **failcount** are the same, the unanswered pings must be consecutive. If **samplesize** is greater than **failcount**, a device that does not always reply to pings may be declared unreachable. The default is 5.

If you are polling a dial-up link (for example, an ISDN call), the fail count must be high enough to allow pings that are lost while the router dials up the link.

The **length** parameter specifies the number of data bytes to include in the data portion of the ping packet. The default is 32.

The **normalinterval** parameter specifies the time in seconds between ping packets when the polled device is considered to be reachable. Packets are sent at this rate until one or more ping replies are not received. The ping packets are then sent at the rate specified by the **criticalinterval** parameter until the device becomes reachable again. We recommend that the value for the **normalinterval** parameter be more than the value for the **criticalinterval** parameter. The default **normalinterval** is 30 seconds.

The **samplesize** parameter specifies the number of pings inspected in order to determine whether the device is reachable. If the number of pings specified by **failcount** go unanswered within the sample window, then the device is declared unreachable. Therefore, if **samplesize** and **failcount** are the same, the unanswered pings must be consecutive. If there are zero failed pings within the **samplesize** window and the state of this polling instance is Up, the rate of sending pings is the normal rate (determined by the **normalinterval** parameter). Otherwise, the device is considered critical and pings are sent at the critical rate (determined by the **criticalinterval** parameter). Pings continue to be sent at the critical rate until the instance re-enters the Up state in order to quickly determine whether the device has become unreachable and when the device becomes reachable again. The value for the **samplesize** parameter must not be less than the value for the **failcount** parameter. If the **samplesize** parameter is not specified, it is set to the value of **failcount**.

The **sipaddress** parameter specifies the source IP address to use in ping packets. If the source address is not specified, the default is to use the address of the interface from which the ping packets are transmitted. The router's local interface IP address is used when it is set. Otherwise, the IP address of the interface from which the ping packets are transmitted is used. If the ping request is to an IPv6 link-local address, the sipaddress must be on the outgoing interface and cannot be a link-local address. If the **sipaddress** parameter has previously been set, it can be restored to its default "not set" state by specifying values of 0.0.0.0 (for IPv4 addresses) or :: (for IPv6 addresses).

The **timeout** parameter specifies the time in seconds to wait for a response to a ping packet. The **timeout** parameter cannot be set to zero. A higher **timeout** may be useful in networks where ping packets have been given a low priority. The default is 1 second.

Configuring many polling instances with a high ratio of timeout to poll time (for example, a timeout of 30 seconds and a poll frequency of 1 second) may result in a large proportion of the router's memory being used in tracking ping responses.

The **upcount** parameter specifies the number of ping replies that must be received in an unbroken sequence in order for the polled device to be declared reachable. The default is 30.

Examples   To add a polling instance with an ID of 5 that polls the IP address 10.32.16.22 every 60 seconds under normal conditions and every 2 seconds under critical conditions, allowing 3 seconds to receive a response, use the command:

```
add ping pol=5 cri=2 nor=60 timeo=3 ip=10.32.16.22
```

Related Commands   delete ping poll
enable ping poll
set ping poll
show ping poll

delete ping poll

Syntax   DELete PING POLl=*poll-id*

where *poll-id* is an integer from 1 to 100

Description   This command deletes a polling instance. Its configuration settings are destroyed.

The **poll** parameter specifies the ID of the polling instance to delete.

Examples   To delete the polling instance with the ID of 5, use the command:

```
del ping pol=5
```

Related Commands   add ping poll
disable ping poll
enable ping poll
reset ping poll
set ping poll
show ping poll

disable ping poll

Syntax   `DISable PING POLl=poll-id`

where *poll-id* is an integer from 1 to 100

Description   This command disables a polling instance. The router stops polling the IP address specified by that instance, but the instance's settings are retained. Polling instances are disabled by default.

The **poll** parameter specifies the ID of the polling instance to disable.

Examples   To disable the polling instance with the ID of 5, use the command:

```
dis ping pol=5
```

Related Commands   enable ping poll
reset ping poll
set ping poll
show ping poll

disable ping poll debug

Syntax   `DISable PING POLl=poll-id DEBug`

where *poll-id* is an integer from 1 to 100

Description   This command disables the debug output for a polling instance. The operating status of the polling instance is not affected by this command.

The **poll** parameter specifies the ID of the polling instance to disable debugging on.

Examples   To disable debugging for the polling instance with the ID of 5, use the command:

```
dis ping pol=5 deb
```

Related Commands   disable ping poll
enable ping poll debug
reset ping poll
show ping poll

enable ping poll

Syntax   `ENAable PING POLl=poll-id`

where *poll-id* is an integer from 1 to 100

Description   This command enables a polling instance and therefore starts the router polling the IP address specified by that polling instance. Counters for that polling instance are reset. Polling instances are disabled by default.

The **poll** parameter specifies the ID of the polling instance to enable.

Examples   To enable the polling instance with the ID of 5, use the command:

    ena ping pol=5

Related Commands   disable ping poll
reset ping poll
set ping poll
show ping poll

enable ping poll debug

Syntax   `ENAble PING POLl=poll-id DEBug`

where *poll-id* is an integer from 1 to 100

Description   This command enables the debug output for a polling instance. The operating status of the polling instance is not affected by this command.

The **poll** parameter specifies the ID of the polling instance to enable debugging of.

Examples   To enable debugging of the polling instance with the ID of 5, use the command:

    enable ping pol=5 deb

Related Commands   disable ping poll debug
reset ping poll
show ping poll

reset ping poll

Syntax   `RESET PING POLl=`*poll-id*

where *poll-id* is an integer from 1 to 100

Description   This command resets a polling instance and all counters are reset. If the polling instance is enabled, the state is returned to Up, and the router re-starts polling the IP address specified in the instance.

If you reset a polling instance that is in a Down state, it enters the Up state but does not activate the "Up" trigger.

The **poll** parameter specifies the ID of the polling instance to reset.

Examples   To reset the polling instance with the ID of 5, use the command:

    reset ping pol=5

Related Commands   delete ping poll
disable ping poll
disable ping poll debug
enable ping poll debug
show ping poll

set ping poll

Syntax   ```
SET PING POLl=poll-id [CRIticalinterval=1..65535]
    [DESCription=poll-description] [FAIlcount=1..100]
    [IPaddress={ipadd|ipv6add[%interface]}]
    [Length=4..1500] [NORmalinterval=1..65535]
    [SAMplesize=1..100] [SIPAddress={ipadd|ipv6add}]
    [TIMEOut=1..30] [UPCount=1..100]
```

where:

■   *poll-id* is an integer from 1 to 100

■   *poll-description* is a character string 1 to 32 characters long. Valid characters are any printable character. If the string includes spaces, it must be in double quotes.

■   *ipadd* is an IP address in dotted decimal notation.

■   *ipv6add* is a valid IPv6 address.

■   *interface* is the interface the ping request is sent for a request to ping an IPv6 link-local address, e.g. eth0

**Description**   This command sets parameters associated with a specific poll. Figure 16-1 on page 16-3 shows the interaction between the polling interval, the device's state, and the **failcount**, **samplesize**, and **upcount** parameters.

The **poll** parameter specifies the ID of the polling instance.

The **criticalinterval** parameter specifies the time in seconds between pings when the router has not received one or more reply packets, or the polled device is considered to be unreachable. It enables the router to quickly observe changes in the state of the device, and should be set to a much lower value than the **normalinterval** parameter. The default for **criticalinterval** is 1 second.

The **description** parameter specifies a string that describes the polling instance. The description allows the polling instance to be recognised easily, and is optional.

The **failcount** parameter specifies the number of pings that must be unanswered, within the total number of pings specified by the **samplesize** parameter, for the router to consider the device unreachable. If **samplesize** and **failcount** are the same, the unanswered pings must be consecutive. If **samplesize** is greater than **failcount**, a device that does not always reply to pings may be declared unreachable. The default is 5.

If you are polling a dial-up link (for example, an ISDN call), the fail count must be high enough to allow pings that are lost while the router dials up the link.

The **ipaddress** parameter specifies the address of the device to be polled. To poll an IPv6 link-local address, you need to supply interface information as well as the address, because a single link-local address can belong to several interfaces. To poll a link-local address, specify the router's interface where ping requests will be sent, as well as the destination address (see the *Internet Protocol Version 6 (IPv6)* chapter of the Software Reference for a diagram of this interface). An example of the syntax for specifying an IPv6 link local address is `fe80::7c27%eth0`.

The **length** parameter specifies the number of data bytes to include in the data portion of the ping packet. The default is 32.

The **normalinterval** parameter specifies the time in seconds between ping packets when the polled device is considered to be reachable. Packets are sent at this rate until one or more ping replies are not received. The ping packets are then sent at the rate specified by the **criticalinterval** parameter until the device becomes reachable again. We recommend that the value for the **normalinterval** parameter be more than the value for the **criticalinterval** parameter. The default **normalinterval** is 30 seconds.

The **samplesize** parameter specifies the number of pings that are inspected in order to determine whether the device is reachable. If the number of pings specified by **failcount** go unanswered within the sample window, then the device is declared unreachable. Therefore, if **samplesize** and **failcount** are the same, the unanswered pings must be consecutive. If there are zero failed pings within the **samplesize** window and the state of this polling instance is Up, the rate of sending pings is the normal rate (determined by the **normalinterval** parameter). Otherwise, the device is considered critical and pings are sent at the critical rate (determined by the **criticalinterval** parameter). Pings continue to be sent at the critical rate until the instance re-enters the Up state in order to quickly determine whether the device has become unreachable and when the device becomes reachable again. The value for the **samplesize** parameter must not be less than the value for the **failcount** parameter.

The **sipaddress** parameter specifies the source IP address to use in ping packets. If the source address is not specified, the default is to use the address of the interface from which the ping packets are transmitted. The router's local interface IP address is used when it is set. Otherwise, the IP address of the interface from which the ping packets are transmitted is used. If the ping

request is to an IPv6 link-local address, the **sipaddress** must be on the outgoing interface and cannot be a link-local address. If the **sipaddress** parameter has previously been set it can be restored to its default "not set" state by specifying values of 0.0.0.0 (for IPv4 addresses) or :: (for IPv6 addresses).

The **timeout** parameter specifies the time in seconds to wait for a response to a ping packet. The **timeout** parameter cannot be zero. A higher **timeout** may be useful in networks where ping packets have been given a low priority. The default is 1 second.

Configuring many polling instances with a high ratio of timeout to poll time (for example, a timeout of 30 seconds and a poll frequency of 1 second) may result in a large proportion of the router's memory being used in tracking ping responses.

The **upcount** parameter specifies the number of ping replies that must be received in an unbroken sequence in order for the polled device to be declared reachable. The default is 30.

**Examples**    To set the ping poll with ID 5 to send ping packets every 10 seconds under normal conditions and every second under critical conditions, use the command:

```
set ping pol=5 cri=1 nor=5
```

Related Commands   add ping poll
delete ping poll
reset ping poll
show ping poll

show ping poll

Syntax   SHow PING POLl[=*poll-id*] [COUnter] [FULl] [STAte={UP|DOwn|
    CRItical}]

where *poll-id* is an integer from 1 to 100

Description   This command displays information about polling instances, either in summary (Figure 16-3 on page 16-17, Table 16-2 on page 16-18) or in full detail (Figure 16-4 on page 16-18, Figure 16-5 on page 16-19, Table 16-3 on page 16-19). Table 16-1 on page 16-17 shows the effect of specifying the **full** and the **counter** parameters, with and without specifying a poll ID. Figure 16-1 on page 16-3 shows the interaction between the polling interval, the device's state, and the **failcount**, **samplesize**, and **upcount** settings.

The **poll** parameter specifies the particular polling instance to display. If no value is specified, then all instances are displayed. However, if the **state** parameter is specified, then all instances that match its value are displayed.

If you specify **counter**, the command also displays diagnostic counters (Figure 16-5 on page 16-19, Table 16-3 on page 16-19). The counters give information about the number and state of packets relevant to ping polling since the router last restarted, since the polling instance was last enabled, or

since the polling instance was last reset using the **reset ping poll** command.

If you specify **full** and do not specify a polling instance, more detailed information is shown for all polling instances (Figure 16-5 on page 16-19, Table 16-3 on page 16-19). The **full** parameter has no effect if you specify a polling instance.

Table 16-1: The effect of different parameter combinations

Optional parameters	POLL=*poll-id*	POLL
—	full information about that polling instance	summary information about all polling instances (including summary of counters)
FULL	full information about that polling instance	full information about all polling instances
COUNTER	full information about that polling instance, plus counters	summary information about all polling instances (including summary of counters)
COUNTER FULL	full information about that polling instance, plus counters	full information about all polling instances, plus counters

The **state** parameter filters the output of this command based on the state of the devices being polled. If **up**, devices currently reachable are displayed. If **down**, devices currently unreachable are displayed. If **critical**, devices are displayed that are not currently confirmed as either reachable or unreachable.

Figure 16-3: Example output from the **show ping poll** command.

```
 Ping Status
 -------------------------------------------------------------------------
 ID    State                     Destination
       upCountCurrent    Upcount    failCountCurrent    Failcount/Sample Size
 -------------------------------------------------------------------------
 1     Up                        10.32.16.3
       30                30         0                   5/5
 -------------------------------------------------------------------------
```

Table 16-2: Parameters in the output of the **show ping poll** command.

Parameter	Meaning
Poll ID	The number used to identify the polling instance.
State	The state of the device being polled: Up - device is reachable Down - device is unreachable Critical Up - device is reachable but recently some ping replies have not been received (so the device may be going down) Critical Down - device is unreachable but the router received a reply to the last ping packet (so the device may be coming back up) Figure 16-1 on page 16-3 shows the interaction between the polling interval, the device's state, and the Failcount, Samplesize, and Upcount settings. Pings are sent at the critical rate for all but the Up state, when they are sent at the normal rate.
Destination	The IP or IPv6 address of the device that is being polled.
upCountCurrent	The current number of ping replies received in an unbroken sequence.
Upcount	The number of ping replies that must be received in an unbroken sequence in order for the polled device to be declared reachable.
failCountCurrent	The number of ping requests that have not received a ping reply in the current Samplesize window.
Failcount	The number of pings that must go unanswered (within the Sample size) for the device to be considered unreachable.
Sample size	The total number of consecutive pings that the router inspects in order to determine whether the device is reachable.

Figure 16-4: Example output from the **show ping poll full** command.

```
  Ping Polling Information
  ----------------------------------------------------------
  Poll 1:
    Destination IP address........... 10.1.1.10
    Description .................... Primary Radar Dish
    State ......................... Up
    Poll enabled .................... Yes
    Normal interval (seconds)........ 30
    Critical interval (seconds)...... 2
    Samplesize ...................... 10
    Failcount ....................... 5
    Upcount ......................... 5
    Timeout (seconds)................ 1
    Source IP address ............... 10.1.2.23
    Length (bytes)................... 32
  ----------------------------------------------------------
```

Figure 16-5: Example output from the **show ping poll counter full** command.

```
Ping Polling Information
--------------------------------------------------------------
Poll 1:
 Destination IP address...... 10.1.1.10
 Description ................ Primary Radar Dish
 State ..................... Up
 Poll enabled .............. Yes
 Normal interval (seconds)... 30
 Critical interval (seconds)..2
 Samplesize ................ 10
 Failcount ................. 5
 Upcount ................... 5
 Timeout (seconds).......... 1
 Source IP address ......... 10.1.2.23
 Length (bytes) ............ 32

Counters:
 upStateEntered ............ 0     downStateEntered .... 1
 pingsSent ................. 727   pingsFailedUpstate .. 5
 pingsFailedDownstate ....... 722
 upCountCurrent ............ 0     failCountCurrent .... 5
--------------------------------------------------------------
```

Table 16-3: Parameters in the output of the **show ping poll full** and **show ping poll counter full** commands.

Parameter	Meaning
Destination IP address	The IP or IPv6 address of the device that is being polled.
Description	A description of the polling instance for easy recognition. When no description is defined, then "not set" is displayed.
State	The state of the device being polled:
	Up - device is reachable
	Down - device is unreachable
	Critical Up - device is reachable but recently some ping replies have not been received (so the device may be going down)
	Critical Down - device is unreachable but the router received a reply to the last ping packet (so the device may be coming back up)
	Figure 16-1 on page 16-3 shows the interaction between the polling interval, the device's state, and the Failcount, Samplesize, and Upcount settings.
	Pings are sent at the critical rate for all but the Up state when they are sent at the normal rate.
Poll enabled	Whether polling instance is enabled.
Normal interval	The time in seconds between ping packets when the device is in the Up state.
Critical interval	The time in seconds between ping packets when the device is not in the Up state.
Samplesize	The total number of consecutive pings that the router inspects in order to determine whether the device is reachable.

Table 16-3: Parameters in the output of the **show ping poll full** and **show ping poll counter full** commands. (continued)

Failcount	The number of pings that must go unanswered (within the sample size) for the device to be considered unreachable.
Upcount	The number of ping replies that must be received in an unbroken sequence in order for the polled device to be declared reachable.
Timeout	The time in seconds that the router waits for a response to a ping packet.
Source IP address	The IP address to be used as the source address in pings sent by this poll. If "not set" is displayed, the router uses the IP address of the interface the ping is sent from.
Length	The number of data bytes included in the data portion of the ping packet.
upStateEntered	The number of times the device has entered the Up state.
downStateEntered	The number of times the device has entered the Down state.
pingsSent	The total number of pings sent.
pingsFailedUpstate	The total number of unanswered pings while in the Up State.
pingsFailedDownstate	The total number of unanswered pings while in the Down state.
upCountCurrent	The current number of ping replies received in an unbroken sequence.
failCountCurrent	The number of ping requests that have not received a ping reply in the current Samplesize window.

Examples   To display summary information about all polling instances, use the command:

```
sh ping pol
```

To display detailed information about Poll 1 use the command:

```
sh ping pol=1
```

To display information and counters for Poll 1 use the command:

```
sh ping pol=1 cou
```

Related Commands   add ping poll
delete ping poll
disable ping poll
disable ping poll debug
enable ping poll
enable ping poll debug
reset ping poll
set ping poll