Chapter 16

Use the ping and traceroute Commands

This chapter describes how to use the ping command to check the availability of various routers in a network topology, and how to use the traceroute command to check the path that packets travel between routers. (See Table 38.)

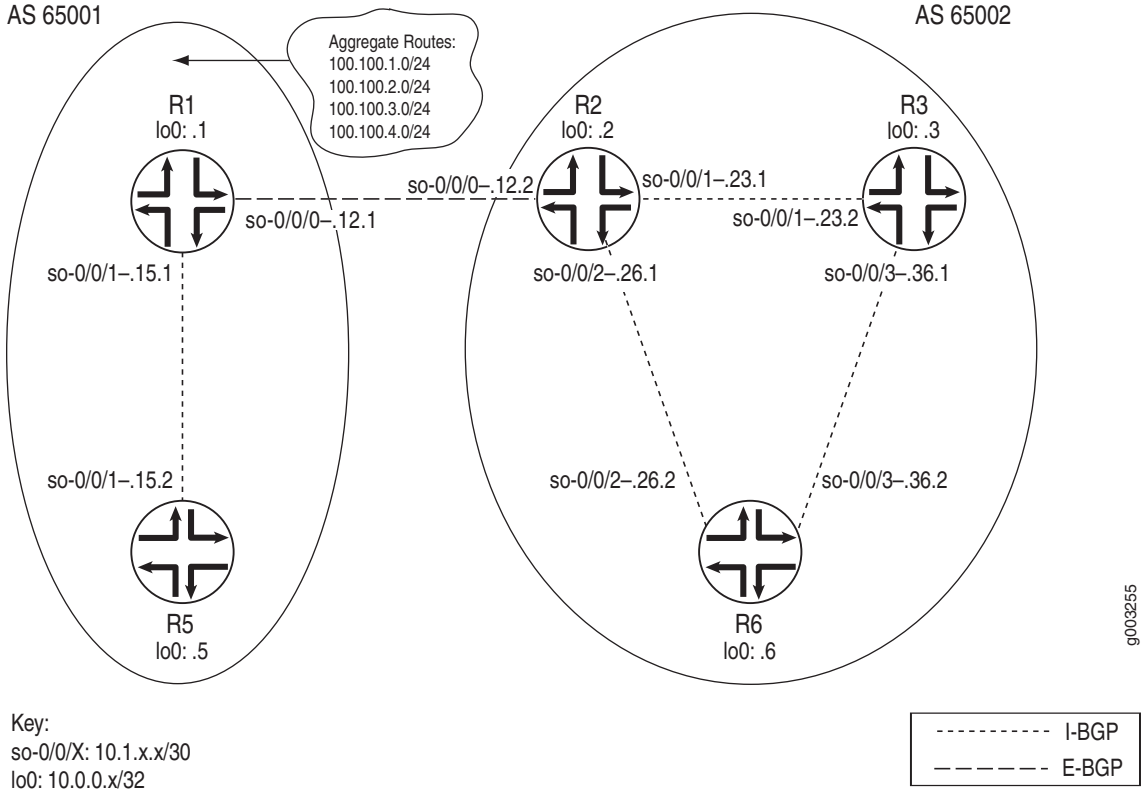
Table 38: Checklist for Using the ping and traceroute Commands

ping and traceroute Command Tasks	Command or Action
Check the Accessibility of Two Routers on the Edge on page 200	
Use Loopback Addresses on page 201	ping *remote-host* count *requests* traceroute *remote-host*
Use Interface Addresses on page 202	ping *interface-address* count *requests* traceroute *interface-address*
Examples of Unsuccessful ping and traceroute Commands on page 203	

Check the Accessibility of Two Routers on the Edge

Purpose This section provides examples of how to use the ping command to check the reachability of various routers in a network topology, and how to use the traceroute command to check the path that packets travel between routers. The topology shown in Figure 17 illustrates these commands.

Figure 17: Topology for ping and traceroute Command Examples



The network in Figure 17 consists of two autonomous systems (ASs). AS 65001 includes two routers, and AS 65002 includes three routers. The border router (R1) in AS 65001 announces aggregated prefixes 100.100/24 to the AS 65002 network.

Steps To Take To check the reachability of routers and the path to the routers, follow these steps:

1. Use Loopback Addresses on page 201
2. Use Interface Addresses on page 202

Step 1: Use Loopback Addresses

Purpose You can ping one router from another router by specifying the other router's loopback address as the IP address in the ping and traceroute commands. In this step, R6 and R5 both ping and traceroute each other.

Action To ping and traceroute between R5 and R6, enter the following JUNOS command-line interface (CLI) operational mode commands:

```
user@host> ping remote-host count requests
user@host> traceroute remote-host
```

Sample Output The following sample output is from R6 to R5, as shown in the network topology in Figure 17:

```
user@R6> ping 10.0.0.5 count 3
PING 10.0.0.6 (10.0.0.6): 56 data bytes
64 bytes from 10.0.0.6: icmp_seq=0 ttl=255 time=0.298 ms
64 bytes from 10.0.0.6: icmp_seq=1 ttl=255 time=0.237 ms
64 bytes from 10.0.0.6: icmp_seq=2 ttl=255 time=0.273 ms

--- 10.0.0.6 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.237/0.269/0.298/0.025 ms

user@R6> traceroute 10.0.0.5
traceroute to 10.0.0.5 (10.0.0.5), 30 hops max, 40 byte packets
 1  10.1.26.1 (10.1.26.1)  0.626 ms  0.530 ms  0.489 ms
 2  10.1.12.1 (10.1.12.1)  0.546 ms  0.534 ms  0.507 ms
 3  10.0.0.5 (10.0.0.5)  0.749 ms  0.694 ms  0.686 ms

user@R5> ping 10.0.0.6 count 3
PING 10.0.0.6 (10.0.0.6): 56 data bytes
64 bytes from 10.0.0.6: icmp_seq=0 ttl=253 time=0.875 ms
64 bytes from 10.0.0.6: icmp_seq=1 ttl=253 time=0.815 ms
64 bytes from 10.0.0.6: icmp_seq=2 ttl=253 time=0.819 ms

--- 10.0.0.6 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.815/0.836/0.875/0.027 ms

user@R5> traceroute 10.0.0.6
traceroute to 10.0.0.6 (10.0.0.6), 30 hops max, 40 byte packets
 1  10.1.15.1 (10.1.15.1)  0.635 ms  39.951 ms  0.526 ms
 2  10.1.12.2 (10.1.12.2)  0.555 ms  0.535 ms  0.515 ms
 3  10.0.0.6 (10.0.0.6)  0.769 ms  0.720 ms  0.674 ms
```

What It Means The sample output shows a successful ping and traceroute between the R6 and R5 loopback (lo0) addresses. The ping is successful because the loopback addresses of both routers are advertised to their directly connected neighbors.

The output for the traceroute command shows the path from R6 to R5, which is through R2.

NOTE: A ping command might lose packets due to rate limiting of Internet Message Control Protocol (ICMP) packets on the specified host.

Step 2: Use Interface Addresses

Purpose You can ping interfaces on remote routers.

Action To ping and traceroute between R5 and R6, enter the following JUNOS CLI operational mode commands:

user@host> **ping** *interface-address* **count** *requests*
user@host> **traceroute** *interface-address*

Sample Output

```
user@R6> ping 10.1.15.2 count 3
PING 10.1.15.2 (10.1.15.2): 56 data bytes
64 bytes from 10.1.15.2: icmp_seq=0 ttl=253 time=2.738 ms
64 bytes from 10.1.15.2: icmp_seq=1 ttl=253 time=0.858 ms
64 bytes from 10.1.15.2: icmp_seq=2 ttl=253 time=0.849 ms

--- 10.1.15.2 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.849/1.482/2.738/0.888 ms

user@R6> traceroute 10.1.15.2
traceroute to 10.1.15.2 (10.1.15.2), 30 hops max, 40 byte packets
 1  10.1.26.1 (10.1.26.1)  0.617 ms  0.534 ms  0.500 ms
 2  10.1.12.1 (10.1.12.1)  3.500 ms  0.543 ms  0.508 ms
 3  10.1.15.2 (10.1.15.2)  0.699 ms  0.700 ms  0.672 ms

user@R5> ping 10.1.36.2 count 3
PING 10.1.36.2 (10.1.36.2): 56 data bytes
64 bytes from 10.1.36.2: icmp_seq=0 ttl=253 time=0.890 ms
64 bytes from 10.1.36.2: icmp_seq=1 ttl=253 time=0.857 ms
64 bytes from 10.1.36.2: icmp_seq=2 ttl=253 time=3.264 ms

--- 10.1.36.2 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.857/1.670/3.264/1.127 ms

user@R5> traceroute 10.1.36.2
traceroute to 10.1.36.2 (10.1.36.2), 30 hops max, 40 byte packets
 1  10.1.15.1 (10.1.15.1)  0.636 ms  7.979 ms  0.497 ms
 2  10.1.12.2 (10.1.12.2)  0.544 ms  0.547 ms  0.512 ms
 3  10.1.36.2 (10.1.36.2)  0.729 ms  0.696 ms  0.672 ms
```

What It Means The sample output shows a successful ping and traceroute between the interfaces on R6 and R5. The ping is successful because the interface addresses of both routers are advertised to their directly connected neighbors.

The output for the traceroute command shows the path from R6 to R5, which is through R2.

NOTE: A ping command might loose packets due to rate limiting of ICMP packets on the specified host.

Examples of Unsuccessful ping and traceroute Commands

Purpose When the ping or traceroute commands are unsuccessful, it is useful to understand the output.

Action To ping and traceroute between R5 and R6, enter the following JUNOS CLI operational mode commands:

user@host> **ping** *interface-address* **count** *requests*
user@host> **traceroute** *interface-address*

Sample Output 1

```
user@R6> ping 10.1.15.2 count 3
PING 10.1.15.2 (10.1.15.2): 56 data bytes
36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS  Len   ID Flg  off TTL Pro  cks      Src      Dst
 4  5  00 0054 3648   0 0000  01  01 465c 10.1.26.2  10.1.15.2

36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS  Len   ID Flg  off TTL Pro  cks      Src      Dst
 4  5  00 0054 364b   0 0000  01  01 4659 10.1.26.2  10.1.15.2

36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS  Len   ID Flg  off TTL Pro  cks      Src      Dst
 4  5  00 0054 364f   0 0000  01  01 4655 10.1.26.2  10.1.15.2

^C
--- 10.1.15.2 ping statistics ---
3 packets transmitted, 0 packets received, 100% packet loss

user@R6> ping 10.0.0.5 count 3
PING 10.0.0.5 (10.0.0.5): 56 data bytes
ping: sendto: No route to host
ping: sendto: No route to host
ping: sendto: No route to host
^C
--- 10.0.0.5 ping statistics ---
3 packets transmitted, 0 packets received, 100% packet loss

user@R6> ping 10.1.15.2
PING 10.1.15.2 (10.1.15.2): 56 data bytes
^C
--- 10.1.15.2 ping statistics ---
4 packets transmitted, 0 packets received, 100% packet loss
```

Sample Output 2

```
user@R6> traceroute 10.1.15.2
traceroute to 10.1.15.2 (10.1.15.2), 30 hops max, 40 byte packets
 1  10.1.26.1 (10.1.26.1)  0.626 ms  0.526 ms  0.494 ms
 2  10.1.26.2 (10.1.26.2)  0.521 ms  0.529 ms  0.509 ms
 3  10.1.26.1 (10.1.26.1)  0.516 ms  0.536 ms  0.523 ms
 4  10.1.26.2 (10.1.26.2)  0.528 ms  0.547 ms  0.524 ms
 5  10.1.26.1 (10.1.26.1)  0.532 ms  0.549 ms  0.535 ms
 6  10.1.26.2 (10.1.26.2)  0.547 ms  0.566 ms  0.543 ms
 7  10.1.26.1 (10.1.26.1)  0.551 ms  0.569 ms  0.538 ms
 8  10.1.26.2 (10.1.26.2)  0.557 ms  0.580 ms  0.567 ms
 9  10.1.26.1 (10.1.26.1)  0.570 ms  0.598 ms  0.570 ms
```

```
user@R6> traceroute 10.1.15.2
traceroute to 10.1.15.2 (10.1.15.2), 30 hops max, 40 byte packets
 1  10.1.36.1 (10.1.36.1)  0.651 ms  7.834 ms  0.506 ms
 2  10.1.23.1 (10.1.23.1)  0.536 ms  0.538 ms  0.504 ms
 3  * * *
 4  * * *
 5  *^C
```

What It Means Sample output 1 shows three instances of the ping command not succeeding. In the first instance, the packets exceed the time-to-live value, which is decremented to 1, indicating that packets are being rejected possibly because of a loop. In the second instance, the local router does not know the route to the host. In the third instance, there is no route to the IP address, which might be due to packets being lost on a remote router.

Sample output 2 shows two instances of the traceroute command not succeeding. In the first instance, there is a loop between shared interfaces on R6 and R2, as indicated by the 10.1.26.1 and 10.1.26.2 appearing repeatedly. In the second instance, the path goes through R3 (10.1.36.1) to R2 (10.1.23.1) when it times out, as indicated by the asterisk (*). The timeout might be due to the absence of a route to the remote interface.