

HSRP Configuration Lab Report

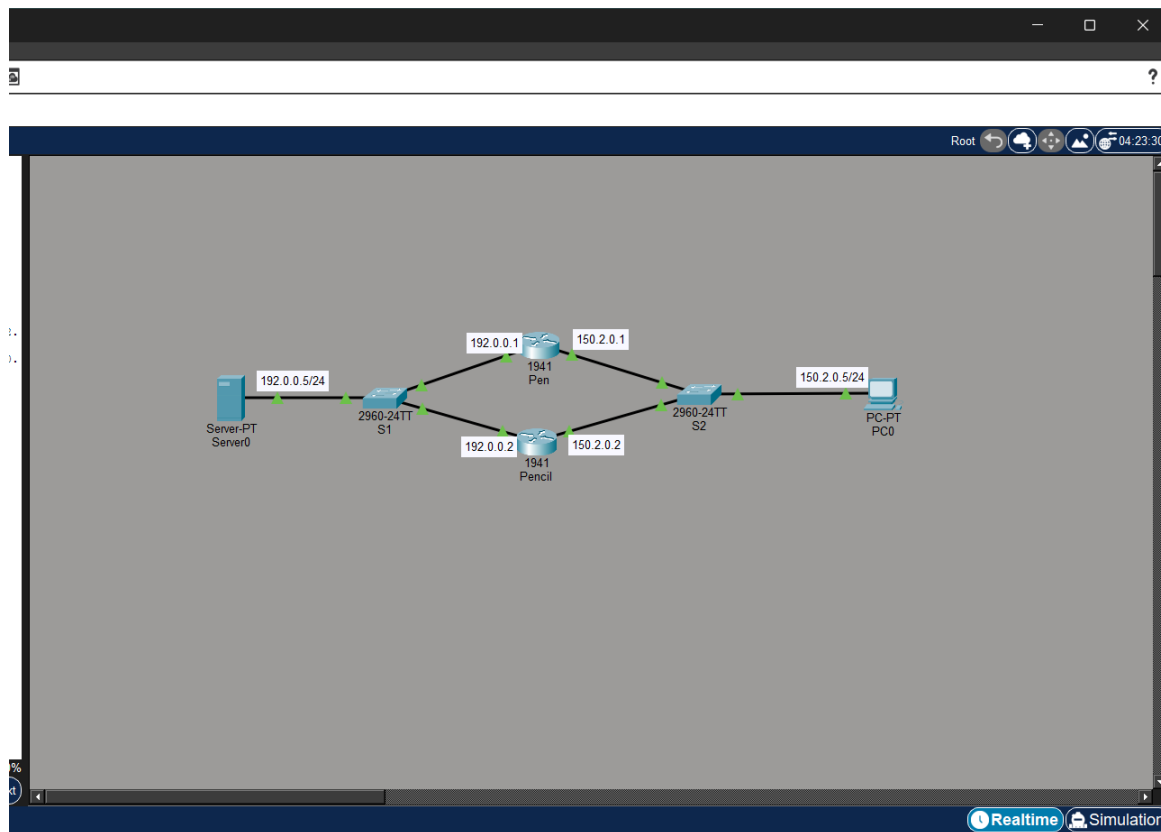
1. Introduction

This report documents the configuration and verification of Hot Standby Router Protocol (HSRP) between the Pen and Pencil routers. The objective is to implement gateway redundancy using HSRP version 2, configure virtual IP addresses on two interfaces, and ensure that the Pen router acts as the preferred active router using preemption.

2. Network Topology Overview

The topology includes two routers (Pen and Pencil), two switches, a server on the 192.0.0.0/24 network, and a PC on the 150.2.0.0/24 network. The routers participate in HSRP to provide default gateway redundancy.

Figure 1: Network Topology



3. IP Addressing Summary

Pen Router:

- g0/0: 192.0.0.1/24
- g0/1: 150.2.0.1/24

Pencil Router:

- g0/0: 192.0.0.2/24
- g0/1: 150.2.0.2/24

HSRP Virtual IPs:

- g0/0: 192.0.0.10 (Group 192)
- g0/1: 150.2.0.10 (Group 150)

4. Configuration Summary

Pen Router is configured with a higher priority (120) and preempt enabled, ensuring that it becomes the Active router whenever available. Pencil Router uses default priority (100) and acts as Standby.

5. Verification Screenshots

5.1 Pen Router - show standby brief



The screenshot shows the Pen Router CLI interface with the following text:

```
Pen
Physical Config CLI Attributes
Pen(config-if)#no shutdown
Pen(config-if)#end
Pen#
%SYS-5-CONFIG_I: Configured from console by console

Pen#
%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 150 state Speak -> Standby
%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 150 state Standby -> Active
Pen#

Pen con0 is now available

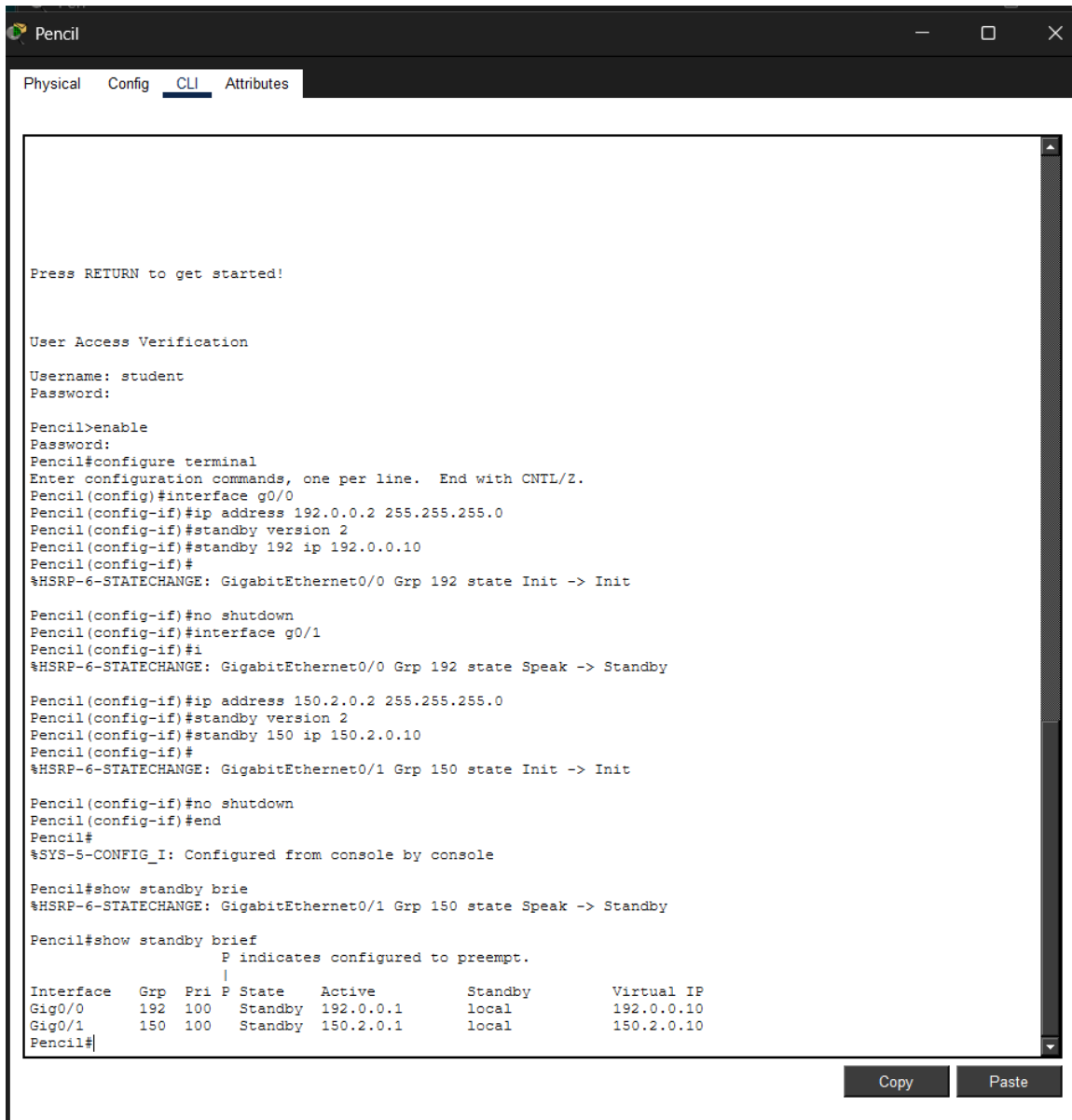
Press RETURN to get started.

User Access Verification
Username: student
Password:

Pen>enable
Password:
Pen#show standby brief
      P indicates configured to preempt.
      |
Interface Grp Pri P State Active Standby Virtual IP
Gig0/0     192 120 P Active local 192.0.0.2 192.0.0.10
Gig0/1     150 120 P Active local 150.2.0.2 150.2.0.10
Pen#
```

At the bottom right of the CLI window, there are buttons for "Copy" and "Paste". At the bottom left, there is a "Top" button.

5.2 Pencil Router - show standby brief



The screenshot shows the Pencil CLI interface with the following content:

```
Pencil
Physical Config CLI Attributes

Press RETURN to get started!

User Access Verification
Username: student
Password:

Pencil>enable
Password:
Pencil#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Pencil(config)#interface g0/0
Pencil(config-if)#ip address 192.0.0.2 255.255.255.0
Pencil(config-if)#standby version 2
Pencil(config-if)#standby 192 ip 192.0.0.10
Pencil(config-if)#
%HSRP-6-STATECHANGE: GigabitEthernet0/0 Grp 192 state Init -> Init

Pencil(config-if)#no shutdown
Pencil(config-if)#interface g0/1
Pencil(config-if)#ip address 150.2.0.2 255.255.255.0
Pencil(config-if)#standby version 2
Pencil(config-if)#standby 150 ip 150.2.0.10
Pencil(config-if)#
%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 150 state Init -> Init

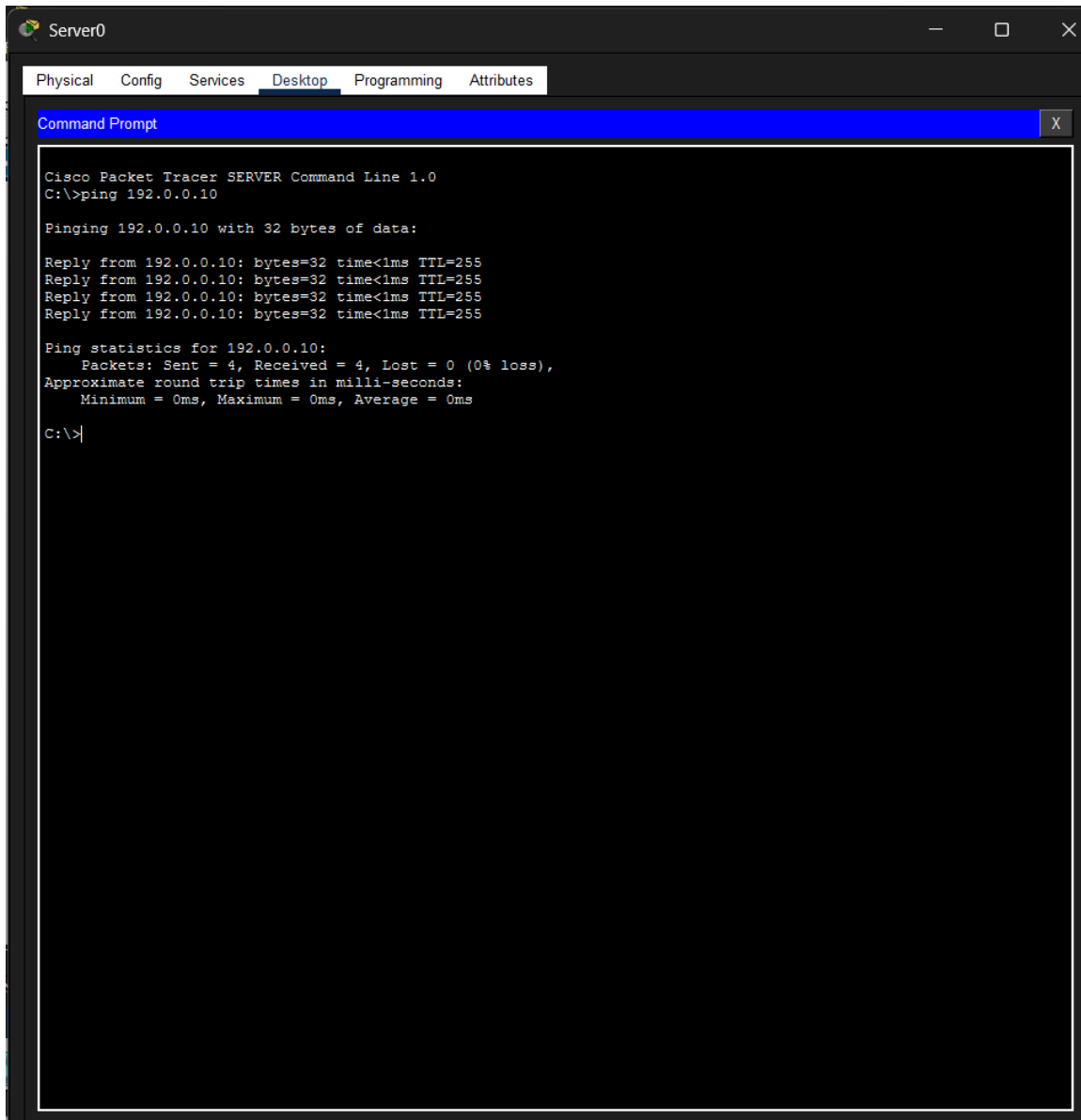
Pencil(config-if)#no shutdown
Pencil(config-if)#end
Pencil#
%SYS-5-CONFIG_I: Configured from console by console

Pencil#show standby brie
%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 150 state Speak -> Standby

Pencil#show standby brief
P indicates configured to preempt.
|
Interface  Grp  Pri  P State    Active      Standby      Virtual IP
Gig0/0     192  100   Standby  192.0.0.1   local        192.0.0.10
Gig0/1     150  100   Standby  150.2.0.1   local        150.2.0.10
Pencil#
```

Copy Paste

5.3 Server - Ping to Virtual IP 192.0.0.10



The screenshot shows a Cisco Packet Tracer interface for a device named 'Server0'. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of a 'ping 192.0.0.10' command, which successfully pings the virtual IP address. The output includes four successful replies and a summary of the ping statistics.

```
Cisco Packet Tracer SERVER Command Line 1.0
C:\>ping 192.0.0.10

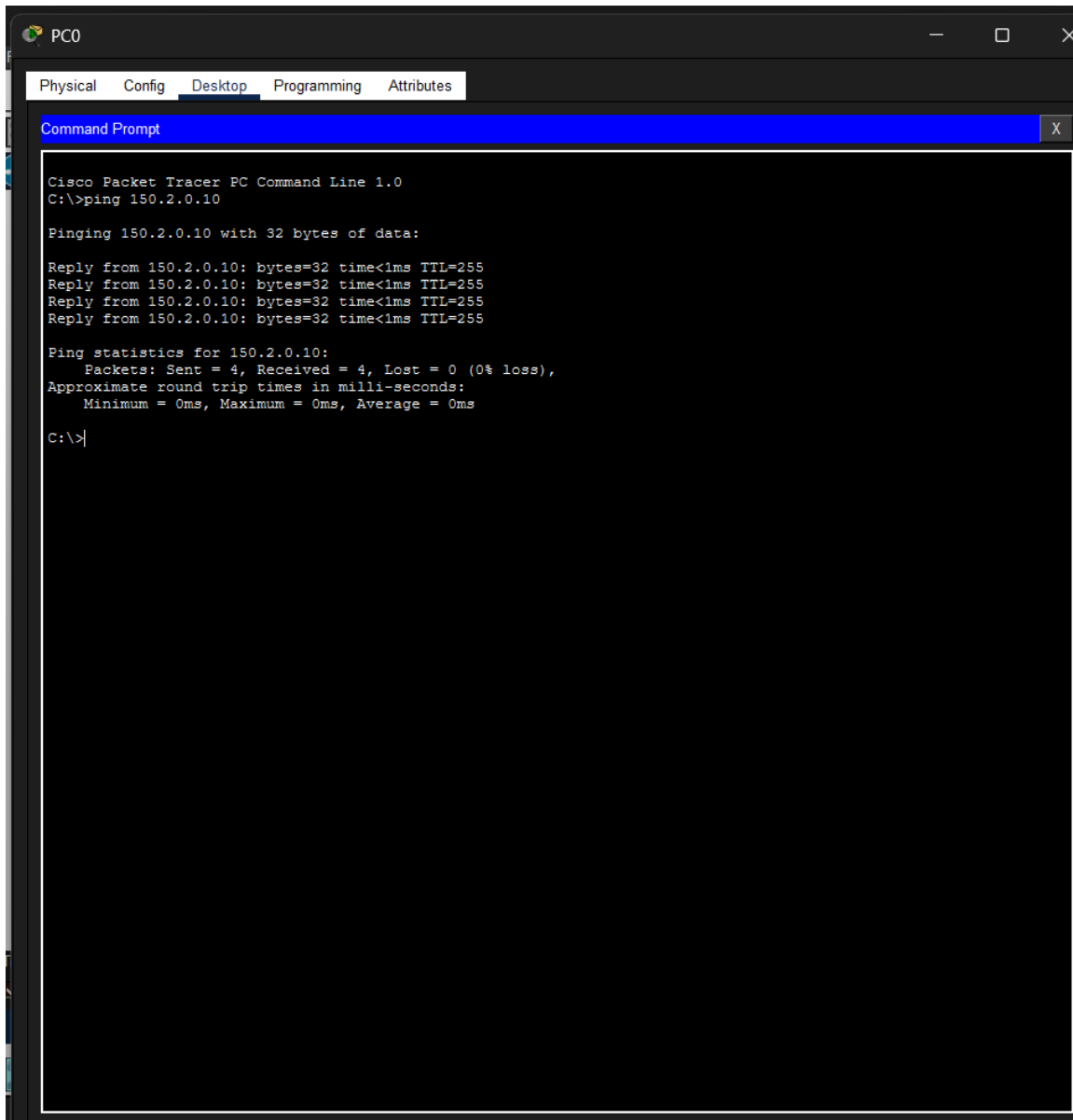
Pinging 192.0.0.10 with 32 bytes of data:

Reply from 192.0.0.10: bytes=32 time<1ms TTL=255
Reply from 192.0.0.10: bytes=32 time<1ms TTL=255
Reply from 192.0.0.10: bytes=32 time<1ms TTL=255
Reply from 192.0.0.10: bytes=32 time<1ms TTL=255

Ping statistics for 192.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

5.4 PC0 - Ping to Virtual IP 150.2.0.10



The screenshot shows a Cisco Packet Tracer window titled "PC0" with tabs for Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is active, displaying a "Command Prompt" window. The command prompt shows the execution of the command "ping 150.2.0.10". The output indicates that the ping was successful, with four replies received, each showing a time of less than 1ms and a TTL of 255. The ping statistics show that all four packets were sent and received, with 0% loss, and the round trip times were all 0ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 150.2.0.10

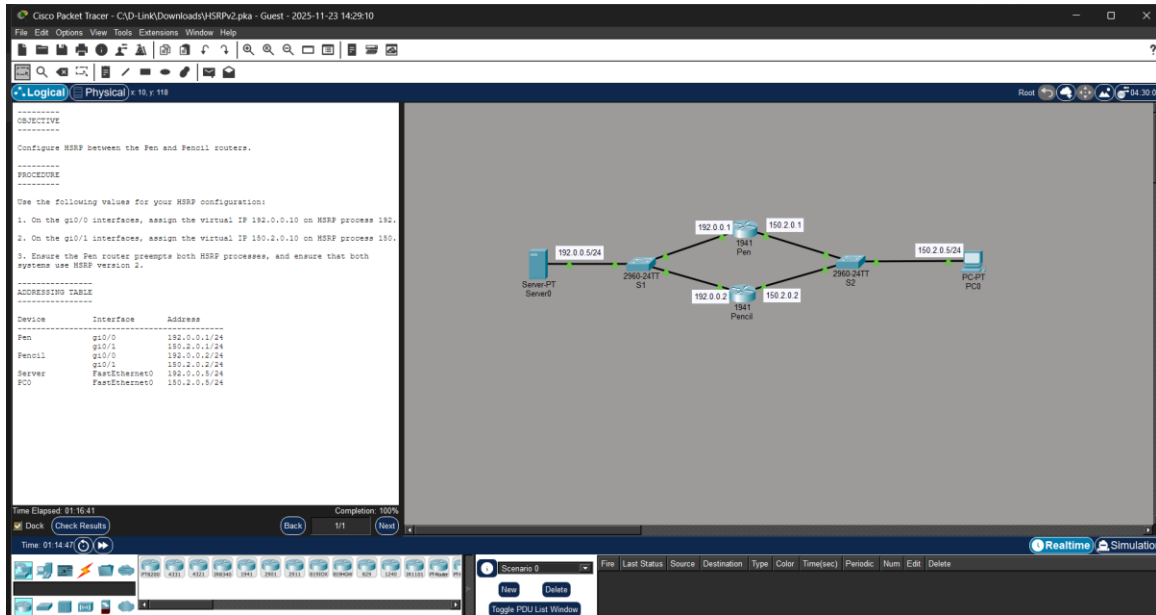
Pinging 150.2.0.10 with 32 bytes of data:

Reply from 150.2.0.10: bytes=32 time<1ms TTL=255
Reply from 150.2.0.10: bytes=32 time<1ms TTL=255
Reply from 150.2.0.10: bytes=32 time<1ms TTL=255
Reply from 150.2.0.10: bytes=32 time<1ms TTL=255

Ping statistics for 150.2.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

Final Topology:



6. Conclusion

The HSRP configuration was successfully implemented. Pen router became the Active router for both HSRP groups, while Pencil correctly transitioned to Standby. Verification tests confirmed successful redundancy through pings to the virtual IP addresses from both network segments. The network now supports fault-tolerant default gateway functionality using HSRP version 2.