24-1 HSRP Configuration - Answer Key

In this lab you will configure and test HSRP for a small campus network.

Basic HSRP

1) Configure basic HSRP for the 10.10.10.0/24 network using the IP addresses shown in the topology diagram.

Check to see if the physical IP addresses for the HSRP interface GigabitEthernet0/1 have been configured on R1 and R2.

```
R1#sh ip int brief
Interface              IP-Address      OK? Method Status                 Protocol
GigabitEthernet0/0     203.0.113.2     YES manual up                     up
GigabitEthernet0/1     unassigned      YES unset  administratively down  down
GigabitEthernet0/2     10.10.20.1      YES manual up                     up
Vlan1                  unassigned      YES unset  administratively down  down
```

They haven't been configured yet so correct that. We'll do R1 first.

```
R1(config)#interface g0/1
R1(config-if)#ip address 10.10.10.2 255.255.255.0
R1(config-if)#no shutdown
```

Then add the virtual IP address.

```
R1(config-if)#standby 1 ip 10.10.10.1
```

Repeat on R2. Use a different physical address and the same virtual IP address.

```
R2(config)#interface g0/1
R2(config-if)#ip address 10.10.10.3 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#standby 1 ip 10.10.10.1
```

2) Wait for HSRP to come up on both routers and then check which is the active router.

Both routers have the same default priority so the router with the highest IP address will be preferred. If you complete the configuration on both routers before HSRP comes up on both then R2 will be active.
(If you configure HSRP on R1 before R2, and HSRP has already come up on R1 before HSRP comes up on R2, then R1 will be active.)

```
R1#show standby
GigabitEthernet0/1 - Group 1
State is Standby
7 state changes, last state change 00:16:34
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.327 secs
Preemption disabled
Active router is 10.10.10.3
Standby router is local
Priority 100 (default 100)
Group name is hsrp-Gig0/1-1 (default)
```

3) Verify that the PCs can ping their default gateway using the HSRP address 10.10.10.1.

```
C:\>ping 10.10.10.1

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=43ms TTL=255
Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 43ms, Average = 11ms
```

4) Verify that the PCs have upstream connectivity via their HSRP default gateway. Ping SP1 at 203.0.113.1

```
C:\>ping 203.0.113.1

Pinging 203.0.113.1 with 32 bytes of data:

Request timed out.
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254
Reply from 203.0.113.1: bytes=32 time=1ms TTL=254

Ping statistics for 203.0.113.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25%
loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

5) What is the MAC address on the physical interface of the active router?

```
R2#show interface g0/1
GigabitEthernet0/1 is up, line protocol is up (connected)
Hardware is CN Gigabit Ethernet, address is 0001.6470.2502
truncated
```

MAC addresses may be different in your lab.

6) What is the MAC address of the HSRP virtual interface?

```
R2#show standby
GigabitEthernet0/1 - Group 1
State is Active
6 state changes, last state change 00:16:22
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 2.475 secs
Preemption disabled
Active router is local
Standby router is 10.10.10.2
Priority 100 (default 100)
Group name is hsrp-Gig0/1-1 (default)
```

7) Verify the PCs are using the virtual MAC address for their default gateway.

```
C:\>arp -a
  Internet Address      Physical Address      Type
  10.10.10.1            0000.0c07.ac01        dynamic
  10.10.10.2            00d0.ffeb.2d02        dynamic
```

Priority and Pre-emption

8) Configure HSRP so that R1 will be the preferred router. Use a single command.

```
R1(config)#interface g0/1
R1(config-if)#standby 1 priority 110
```

9) Which router do you expect will be active now? Verify this.

R2 will remain active because we didn't configure pre-emption.

```
R1#show standby
GigabitEthernet0/1 - Group 1
State is Standby
7 state changes, last state change 00:06:06
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.782 secs
Preemption disabled
Active router is 10.10.10.3
Standby router is local
Priority 110 (configured 110)
Group name is hsrp-Gig0/1-1 (default)
```

10) Ensure that R1 is the active router. Do not reboot.

```
R1(config)#int g0/1
R1(config-if)#standby 1 preempt

R1#show standby
GigabitEthernet0/1 - Group 1
State is Active
9 state changes, last state change 00:27:09
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.275 secs
Preemption enabled
Active router is local
Standby router is 10.10.10.3, priority 100 (expires in 8
sec)
Priority 110 (configured 110)
Group name is hsrp-Gig0/1-1 (default)
```

Test HSRP

11) Run a continuous ping to the HSRP IP address from PC1 with the 'ping 10.10.10.1 –n 1000' command.

```
C:\>ping 10.10.10.1 -n 1000

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time=13ms TTL=255
Reply from 10.10.10.1: bytes=32 time=32ms TTL=255
Reply from 10.10.10.1: bytes=32 time=2ms TTL=255
```

12) Save the configuration on R1 then reboot.

```
R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1#reload
Proceed with reload? [confirm]
```

13) View the ping output on PC1. You should see a few dropped pings as R2 transitions to active following the outage of R1.

```
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=15ms TTL=255
Request timed out.
Request timed out.
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=11ms TTL=255
Reply from 10.10.10.1: bytes=32 time=14ms TTL=255
Reply from 10.10.10.1: bytes=32 time=12ms TTL=255
```

14) Verify R2 has transitioned to HSRP active.

```
R2#show standby
GigabitEthernet0/1 - Group 1
State is Active
9 state changes, last state change 00:33:44
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.074 secs
Preemption disabled
Active router is local
Standby router is unknown, priority 110
Priority 100 (default 100)
Group name is hsrp-Gig0/1-1 (default)
```

15) Wait for R1 to complete booting and HSRP to come up. Verify R1 transitions to HSRP active because pre-emption is enabled.

```
R1#show standby
GigabitEthernet0/1 - Group 1
State is Active
5 state changes, last state change 00:00:38
Virtual IP address is 10.10.10.1
Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 2.533 secs
Preemption enabled
Active router is local
Standby router is 10.10.10.3
Priority 110 (configured 110)
Group name is hsrp-Gig0/1-1 (default)
```

16) Hit 'Ctrl-C' to cancel the ping on PC1. If you scroll back you should see a dropped ping or two as R1 transitioned back to HSRP active.


```
Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=10ms TTL=255
Reply from 10.10.10.1: bytes=32 time=19ms TTL=255
Request timed out.
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=13ms TTL=255
Reply from 10.10.10.1: bytes=32 time=13ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
```