Lab – Configure IP SLA ICMP Echo

Topology
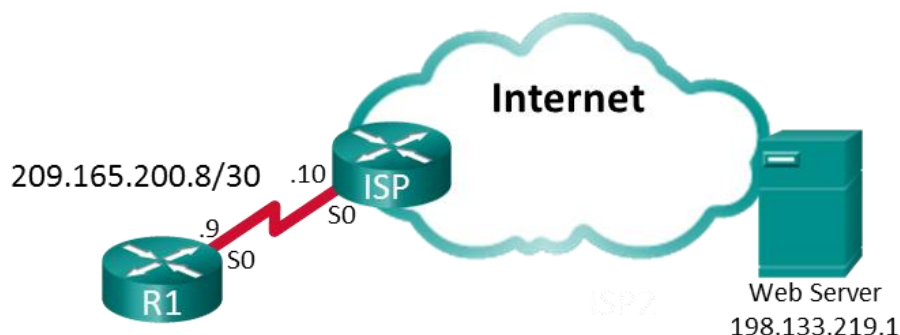
Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	S0/0/0	209.165.200.9	255.255.255.252	N/A
ISP	S0/0/0	209.165.200.10	255.255.255.252	N/A
	Lo0	198.133.219.1	255.255.255.255	N/A

Objectives

Part 1: Build the Network and Verify Connectivity

Part 2: Configure IP SLA ICMP Echo on R1

Part 3: Test and Monitor the IP SLA Operation

Background / Scenario

An outside vendor has been contracted to provide web services for your company. As the network administrator, you have been asked to monitor the vendor's service. You decide to configure IP SLA to help with that task.

Note: The routers used with CCNA hands-on labs are Cisco 1941 Integrated Services Routers (ISRs) with Cisco IOS Release 15.2(4)M3 (universalk9 image). The switches used are Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of this lab for the correct interface identifiers.

Note: Make sure that the routers and switches have been erased and have no startup configurations. If you are unsure, contact your instructor.

Required Resources

- 2 Router (Cisco 1941 with Cisco IOS Release 15.2(4)M3 universal image or comparable)
- Console cables to configure the Cisco IOS devices via the console ports
- Serial cable as shown in the topology

Part 1:   Build the Network and Verify Connectivity

In Part 1, you will set up the network topology and configure basic settings, such as the interface IP addresses, static routing, device access, and passwords.

Step 1:   Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2:   Initialize and reload the routers as necessary.

Step 3:   Configure basic settings for R1.

a.   Disable DNS lookup.

b.   Configure the device name as shown in the topology.

c.   Configure an IP address for the router as listed in the Addressing Table.

d.   Assign **class** as the encrypted privileged EXEC mode password.

e.   Assign **cisco** for the console and vty password, enable login.

f.   Configure **logging synchronous** to prevent console messages from interrupting command entry.

g.   Configure the default route for R1 to the ISP S0/0/0 IP address.

h.   Copy the running configuration to the startup configuration.

Step 4:   Copy and paste the configuration to the ISP router.

The ISP router configuration is provided below. Copy and paste this configuration into the ISP router. Loopback 0 is being used to simulate the Web server shown in the Topology.

```
hostname ISP
no ip domain lookup
interface Loopback0
 ip address 198.133.219.1 255.255.255.255
interface Serial0/0/0
 ip address 209.165.200.10 255.255.255.252
 no shut
end
```

Step 5:   Verify connectivity.

a.   From R1, you should be able to ping the ISP Serial interface IP address. Were all pings successful?

    If the pings are not successful, troubleshoot the basic device configurations before continuing.

b.   From R1, you should be able to ping the Web Server IP address. Were all pings successful?

    If the pings are not successful, troubleshoot the basic device configurations before continuing.

Part 2:   Configure IP SLA ICMP Echo on R1

In Part 2, you configure an IP SLA ICMP Echo operation on R1. Use the following parameters for this operation:

- Operation-number: **22**
- ICMP Echo Destination Address: **198.133.219.1**
- Frequency: **20 seconds**
- Schedule Start: **Now**
- Schedule Life time: **Forever**

Step 1:   Create an IP SLA Operation.

Step 2:   Configure the ICMP Echo Operation.

Step 3:   Set the rate the IP SLA operation repeats.

Step 4:   Schedule the IP SLA ICMP Echo operation.

Step 5:   Use show command to verify the IP SLA configuration.

Part 3:   Test and Monitor the IP SLA Operation

In Part 3, you will simulate an outage of web services. This can be done by an administratively shutdown of the loopback 0 interface on the ISP router. You will then display the IP SLA operation statistics to monitor the effect of this test.

Step 1:   Shutdown the loopback 0 interface on the ISP router.

```
ISP(config)# interface Lo0
ISP(config-if)# shutdown
ISP(config-if)#
*Nov 28 14:00:52.823: %LINK-5-CHANGED: Interface Loopback0, changed state to
administratively down
*Nov 28 14:00:53.823: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
changed state to down
ISP(config-if)#
```

Note: Wait a few minutes before executing Step 2.

Step 2:   Activate the loopback 0 interface on the ISP router.

```
R2(config-if)# no shutdown
R2(config-if)#
*Nov 28 14:04:23.263: %LINK-3-UPDOWN: Interface Loopback0, changed state to up
*Nov 28 14:04:24.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
changed state to up
R2(config-if)#
```

Step 3:   Issue the command used to display the IP SLA operation statistics on R1.

```
R1# show ip sla statistics
```

```
IPSLAs Latest Operation Statistics


IPSLA operation id: 22
      Latest RTT: 1 milliseconds
Latest operation start time: 18:44:45 UTC Thu Jan 28 2016
Latest operation return code: OK
Number of successes: 103
Number of failures: 10
Operation time to live: Forever
```

Note: You should see a failure count greater than zero if you waited more than 20 seconds before re-activating the loopback 0 interface on the ISP router.

The IP SLA configured in Part 2 will run forever. How would you stop the IP SLA from running but still leave the IP SLA configured to use at a future time?

Reflection

Using the lab's **show ip sla statistics** example, what does the failure count indicate about the Web Server?

Router Interface Summary Table

Router Interface Summary				
Router Model	**Ethernet Interface #1**	**Ethernet Interface #2**	**Serial Interface #1**	**Serial Interface #2**
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.				