Hands On Skills Exam – CCNAv7 SRWE Skills Assessment (Answers)

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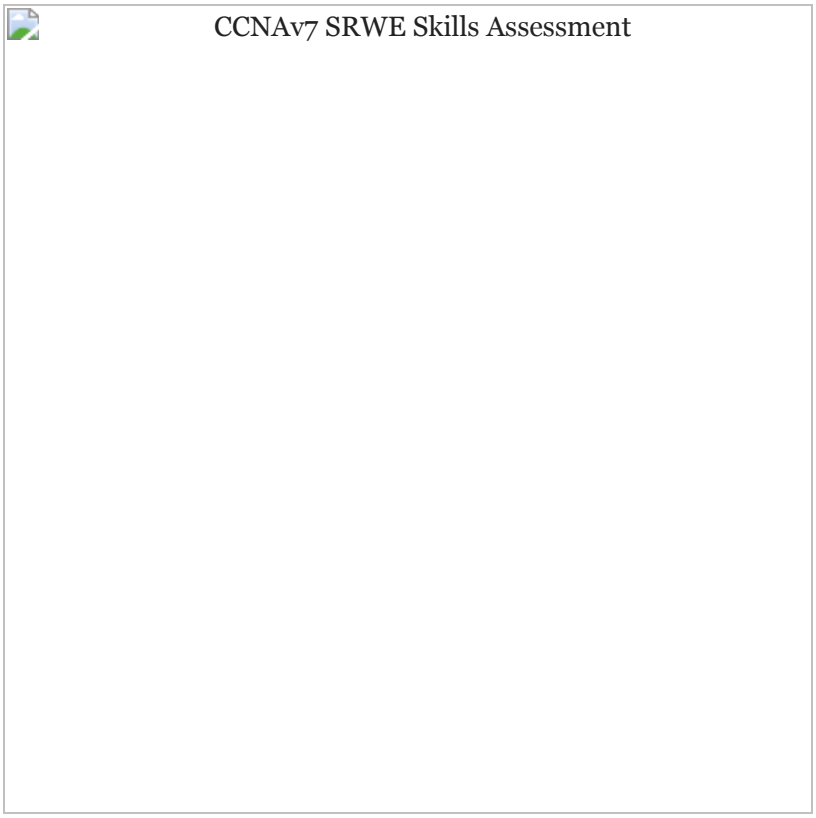
October 3, 2020

SRWE Final Skills Exam (Equipment)

Your exam may be different

Topology



CCNAv7 SRWE Skills Assessment

Assessment Objectives

- **Part 1: Initialize, Reload and Configure Basic Device Settings** (45 points, 45 minutes)
- **Part 2: Configure Network Infrastructure Settings (VLANs, Trunking, Etherchannel)** (30 points, 25 minutes)
- **Part 3: Configure Host Support** (20 points, 25 minutes)
- **Part 4: Test and Verify IPv4 and IPv6 End-to-End Connectivity** (5 points, 10 minutes)

Scenario

In this Skills Assessment (SA) you will configure the devices in a small network. You must configure a router, switch and PCs to support both IPv4 and IPv6 connectivity for supported hosts. Your router and switch must also be managed securely. You will configure inter-VLAN routing, DHCP, Etherchannel, and port-security.

Required Resources

- 1 Router (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 2 Switches (Cisco 2960 with Cisco IOS Release 15.2(2) lanbasek9 image or comparable)
- 2 PCs (Windows with a terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

VLAN Table

Addressing Table

VLAN	VLAN Name
2	Bikes
3	Trikes
4	Management
5	Parking
6	Native

Addressing Table

Device / Interface	IP Address / Prefix	Default Gateway
R1 G0/0/1.2	10.19.8.1 /26	N/A
	2001:db8:acad:a::1 /64	N/A
R1 G0/0/1.3	10.19.8.65 /27	N/A
	2001:db8:acad:b::1 /64	N/A
R1 G0/0/1.4	10.19.8.97 /29	N/A
	2001:db8:acad:c::1 /64	N/A
R1 G0/0/1.6	N/A	N/A

Device / Interface	IP Address / Prefix	Default Gateway
R1 Loopback0	209.165.201.1 /27	N/A
	2001:db8:acad:209::1 /64	N/A
S1 VLAN 4	10.19.8.98 /29	10.19.8.97
	2001:db8:acad:c::98 /64	N/A
	fe80::98	N/A
S2 VLAN 4	10.19.8.99 /29	10.19.8.97
	2001:db8:acad:c::99 /64	N/A
	fe80::99	N/A
PC-A NIC	DHCP for IPv4 address	DHCP for IPv4 default gateway
	2001:db8:acad:a::50 /64	fe80::1
PC-B NIC	DHCP for IPv4 address	DHCP for IPv4 default gateway
	2001:db8:acad:b::50 /64	fe80::1

Note: There is no interface on the router supporting VLAN 5.

Instructions

Part 1: Initialize, Reload and Configure Basic Device Settings

- **Total points: 45**
- **Time: 20 minutes**

Step 1: Initialize and reload router and switch.

- Erase the startup configurations and VLANs from the **router** and **switch** and reload the devices.
- After the switch is reloaded, configure the SDM template to support IPv6 as needed, and reload the **switch** again.
- Before proceeding, have your instructor verify device initializations.

Use the console cable to connect from PC-A to the Router/Switch (console port)
Go to **PC-A**, **Desktop** tab, **Terminal** app
Router, Switch1, Switch 2:

```
Router/Switchs >enable
Router/Switchs #erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router/Switchs #reload
System configuration has been modified. Save? [yes/no]:yes
Building configuration...
[OK]
```

Switch1 & Switch 2:

```
Switch(config)# sdm prefer dual-ipv4-and-ipv6 default
Switch(config)# exit
Switch# reload
Proceed with reload? [confirm]
```

Step 2: Configure R1.

Configuration tasks for **R1** include the following:

Task	Specification	Points
Disable DNS lookup		0.5 pt
Router name	R1	0.5 pt
Domain name	ccna-lab.com	0.5 pt
Encrypted privileged EXEC password	ciscoenpass	1 pt
Console access password	ciscoconpass	1 pt
Set the minimum length for passwords	10 characters	1 pt
Create an administrative user in the local database	Username: **admin** Password: **admin1pass**	1 pt
Set login on VTY lines to use local database		1 pt
Set VTY lines to accept SSH connections only		1 pt
Encrypt the clear text passwords		1 pt
Configure an MOTD Banner		0.5 pt
Enable IPv6 Routing		1 pt

Task	Specification	Points
Configure Interface G0/0/1 and sub interfaces	Set the description Set the IPv4 address Set the IPv6 Link Local Address as **fe80::1** Set the IPv6 address Activate Interface	4 pts
Configure the Loopback0 interface	Set the description Set the IPv4 address Set the IPv6 address Set the IPv6 Link Local Address as **fe80::1**	2 pts
Generate an RSA crypto key	1024 bits modulus	1 pt

```
Router>enable
Router#config terminal
Router(config)#no ip domain lookup

Router(config)#hostname R1

R1(config)#ip domain name ccna-lab.com

R1(config)#enable secret ciscoenpass

R1(config)#line console 0
R1(config-line)#password ciscoconpass
R1(config-line)#login
R1(config-line)#exit

R1(config)#security passwords min-length 10

R1(config)#username admin secret admin1pass

R1(config)#line vty 0 15
R1(config-line)#login local
R1(config-line)#transport input ssh
R1(config-line)#exit

R1(config)#service password-encryption

R1(config)#banner motd #Unauthorized Acess is Prohibited#

R1(config)#ipv6 unicast-routing

R1(config)#interface g0/0/1.2
R1(config-subif)#encapsulation dot1Q 2
R1(config-subif)#description Bikes
R1(config-subif)#ip address 10.19.8.1 255.255.255.192
R1(config-subif)#ipv6 address 2001:db8:acad:a::1/64
R1(config-subif)#ipv6 address fe80::1 link-local

R1(config-subif)#interface g0/0/1.3
R1(config-subif)#encapsulation dot1Q 3
R1(config-subif)#description Trikes
R1(config-subif)#ip address 10.19.8.65 255.255.255.224
R1(config-subif)#ipv6 address 2001:db8:acad:b::1/64
R1(config-subif)#ipv6 address fe80::1 link-local

R1(config-subif)#interface g0/0/1.4
R1(config-subif)#encapsulation dot1Q 4
R1(config-subif)#description Management
R1(config-subif)#ip address 10.19.8.97 255.255.255.248
R1(config-subif)#ipv6 address 2001:db8:acad:c::1/64
R1(config-subif)#ipv6 address fe80::1 link-local

R1(config-subif)#interface g0/0/1.6
```

```
R1(config-subif)#encapsulation dot1Q 6
R1(config-subif)#description Native

R1(config)#interface g0/0/1
R1(config-if)#no shutdown

R1(config-subif)#interface Loopback 0
R1(config-subif)#description Loopback
R1(config-subif)#ip address 209.165.201.1 255.255.255.224
R1(config-subif)#ipv6 address 2001:db8:acad:209::1/64
R1(config-subif)#ipv6 address fe80::1 link-local
R1(config-subif)#description Native
R1(config-subif)#exit

R1(config)#crypto key generate rsa
1024
```

Step 3: Configure S1 and S2.

Configuration tasks for the switches include the following:

Task	Specification	S1	S2
Disable DNS lookup		0.5pt	0.5pt
Switch name	**S1 or S2, as appropriate**	0.5pt	0.5pt
Domain name	**ccna-lab.com**	0.5pt	0.5pt
Encrypted privileged EXEC password	**ciscoenpass**	1pt	1pt
Console access password	**ciscoconpass**	1pt	1pt
Create an administrative user in the local database	Username: **admin** Password: **admin1pass**	1pt	1pt
Set login on VTY lines to use local database		1pt	1pt
Set VTY lines to accept SSH connections only		1pt	1pt
Encrypt the clear text passwords		1pt	1pt
Configure an MOTD Banner		0.5pt	0.5pt
Generate an RSA crypto key	**1024 bits modulus**	1pt	1pt

Task	Specification	S1	S2
Configure Management Interface (SVI)	Set the Layer 3 IPv4 address Set the Ipv6 Link Local Address as **FE80::98 for S1 and FE80::99 for S2** Set the Layer 3 IPv6 address	2pts	2pts
Configure Default Gateway	Configure the default gateway as 10.19.8.97 for IPv4	1pt	1pt

```
Switch1>enable
Switch1#conf t
Switch1(config)#no ip domain lookup
Switch1(config)#hostname S1

S1(config)#ip domain name ccna-lab.com

S1(config)#enable secret ciscoenpass

S1(config)#line console 0
S1(config-line)#password ciscoconpass
S1(config-line)#login
S1(config-line)#exit

S1(config)#username admin secret admin1pass
S1(config)#line vty 0 15
S1(config-line)#login local
S1(config-line)#transport input ssh
S1(config-line)#exit

S1(config)#service password-encryption

S1(config)#banner motd #Unauthorized Access is Prohibitted!#

S1(config)#crypto key generate rsa
1024

S1(config)#interface vlan 4
S1(config-if)#ip address 10.19.8.98 255.255.255.248
S1(config-if)#ipv6 address 2001:db8:acad:c::98/64
S1(config-if)#ipv6 address fe80::98 link-local
S1(config-if)#description Management Interface
S1(config-if)#no shutdown
S1(config-if)#exit

S1(config)#ip default-gateway 10.19.8.97
```

```
Switch2>enable
Switch2#conf t
Switch2(config)#no ip domain lookup
Switch2(config)#hostname S2

S2(config)#ip domain name ccna-lab.com

S2(config)#enable secret ciscoenpass

S2(config)#line console 0
S2(config-line)#password ciscoconpass
S2(config-line)#login
S2(config-line)#exit

S2(config)#username admin secret admin1pass
S2(config)#line vty 0 15
S2(config-line)#login local
S2(config-line)#transport input ssh
S2(config-line)#exit

S2(config)#service password-encryption

S2(config)#banner motd #Unauthorized Access is Prohibitted!#

S2(config)#crypto key generate rsa
1024

S2(config)#interface vlan 4
S2(config-if)#ip address 10.19.8.99 255.255.255.248
S2(config-if)#ipv6 address 2001:db8:acad:c::99/64
S2(config-if)#ipv6 address fe80::99 link-local
S2(config-if)#description Management Interface
S2(config-if)#no shutdown
S2(config-if)#exit

S2(config)#ip default-gateway 10.19.8.97
```

Points for Step 1 (4 points):
Points for Step 2 (17 points):
Points for Step 3 (24 points):
Instructor Sign-off Part 1:
Instructor Sign-off
Total Points for Part 1 (45 points)

Part 2: Configure Network Infrastructure Settings (VLANs, Trunking, EtherChannel)

- **Total points: 30**
- **Time: 20 minutes**

Step 1: Configure S1.

Configuration tasks for S1 include the following:

Task	Specification	Points
Create VLANs	VLAN 2, name Bikes VLAN 3, name Trikes VLAN 4, name Management VLAN 5, name Parking VLAN 6, name Native	5 points
Create 802.1Q trunks that use the native VLAN 6	Interfaces F0/1, F0/2, and F0/5	1 point
Create a Layer 2 EtherChannel port group that uses interfaces F0/1 and F0/2	Use the LACP protocol for negotiation	2 points
Configure host access port for VLAN 2	Interface F0/6	1 point
Configure port-security on access ports	Allow 3 MAC addresses	2 points
Secure all unused interfaces	Assign to VLAN 5, Set to access mode, add a description, and shutdown	4 points

```
S1(config)#vlan 2
S1(config-vlan)#name Bikes
S1(config-vlan)#vlan 3
S1(config-vlan)#name Trikes
S1(config-vlan)#vlan 4
S1(config-vlan)#name Management
S1(config-vlan)#vlan 5
S1(config-vlan)#name Parking
S1(config-vlan)#vlan 6
S1(config-vlan)#name Native

S1(config)#interface range f0/1-2
S1(config-if-range)#switchport trunk encapsulation dot1q (#option)
S1(config-if-range)#switchport mode trunk
S1(config-if-range)#switchport trunk native vlan 6
S1(config-if-range)#switchport trunk allowed vlan 2-6
S1(config-if-range)#exit

S1(config)#interface f0/5
S1(config-if)#switchport trunk encapsulation dot1q (#option)
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 6
S1(config-if)#switchport trunk allowed vlan 2-6
S1(config-if)#exit

S1(config)#interface range f0/1-2
S1(config-if-range)#channel-group 1 mode active
S1(config-if-range)#exit

S1(config)#interface f0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 2
S1(config-if)#switchport port-security maximum 3

S1(config)#interface range f0/3-4
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 5
S1(config-if-range)#description Unused Interfaces
S1(config-if-range)#shutdown

S1(config)#interface range f0/7-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 5
S1(config-if-range)#description Unused Interfaces
S1(config-if-range)#shutdown

S1(config)#interface range g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 5
S1(config-if-range)#description Unused Interfaces
S1(config-if-range)#shutdown
```

Note: This configuration assumes the use of Cisco Catalyst **2960** switches which automatically use **802.1Q encapsulation** on trunk links. Other switches may require manual configuration of the encapsulation. Always configure both ends of a trunk link with the same native VLAN. If 802.1Q trunk configuration is not the same on both ends, Cisco IOS Software reports errors.

Step 2: Configure S2.

Configuration tasks for S2 include the following:

Task	Specification	Points
Create VLANs	VLAN 2, name Bikes VLAN 3, name Trikes VLAN 4, name Management VLAN 5, name Parking VLAN 6, name Native	5 points
Create 802.1Q trunks that use the native VLAN 6	Interfaces F0/1 and F0/2	1 point
Create a Layer 2 EtherChannel port group that uses interfaces F0/1 and F0/2	Use the LACP protocol for negotiation	2 points
Configure host access port for VLAN 3	Interface F0/18	1 point
Configure port-security on access ports	Allow 3 MAC addresses	2 points
Secure all unused interfaces	Assign to VLAN 5, Set to access mode, add a description, and shutdown	4 points

```
S2(config)#vlan 2
S2(config-vlan)#name Bikes
S2(config-vlan)#vlan 3
S2(config-vlan)#name Trikes
S2(config-vlan)#vlan 4
S2(config-vlan)#name Management
S2(config-vlan)#vlan 5
S2(config-vlan)#name Parking
S2(config-vlan)#vlan 6
S2(config-vlan)#name Native

S2(config)#interface range f0/1-2
S2(config-if-range)#switchport trunk encapsulation dot1q (#option)
S2(config-if-range)#switchport mode trunk
S2(config-if-range)#switchport trunk native vlan 6
S2(config-if-range)#switchport trunk allowed vlan 2-6
S2(config-if-range)#exit

S2(config)#interface range f0/1-2
S2(config-if-range)#channel-group 1 mode active
S2(config-if-range)#exit

S2(config)#interface f0/18
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 3
S2(config-if)#switchport port-security maximum 3

S2(config)#interface range f0/3-17
S2(config-if-range)#switchport mode access
S2(config-if-range)#switchport access vlan 5
S2(config-if-range)#description Unused Interfaces
S2(config-if-range)#shutdown
S2(config)#interface range f0/19-24
S2(config-if-range)#switchport mode access
S2(config-if-range)#switchport access vlan 5
S2(config-if-range)#description Unused Interfaces
S2(config-if-range)#shutdown
S2(config)#interface range g0/1-2
S2(config-if-range)#switchport mode access
S2(config-if-range)#switchport access vlan 5
S2(config-if-range)#description Unused Interfaces
S2(config-if-range)#shutdown
```

Note: This configuration assumes the use of Cisco Catalyst **2960** switches which automatically use **802.1Q encapsulation** on trunk links. Other switches may require manual configuration of the encapsulation. Always configure both ends of a trunk link with the same native VLAN. If 802.1Q trunk configuration is not the same on both ends, Cisco IOS Software reports errors.
Points for Step 1 (15 points):

Points for Step 2 (15 points):

Instructor Sign-off Part 2:
Instructor Sign-off
Total Points for Part 2 (30 points)

Part 3: Configure Host Support

- **Total points: 20**
- **Time: 10 minutes**

Step 1: Configure R1

Configuration Tasks for R1 include the following

Task	Specification	Points
Configure Default Routing	Create a default routes for IPv4 and IPv6 that direct traffic to interface Loopback 0	(4 points)
Configure IPv4 DHCP for VLAN 2	Create a DHCP pool for VLAN 2, consisting of the last 10 addresses in the subnet only. Assign the domain name ccna-a.net and specify the default gateway address as the router interface address for the subnet involved	(6 points)
Configure IPv4 DHCP for VLAN 3	Create a DHCP pool for VLAN 3, consisting of the last 10 addresses in the subnet only. Assign the domain name ccna-b.net and specify the default gateway address as the router interface address for the subnet involved	(6 points)

```
R1(config)#ip route 0.0.0.0 0.0.0.0 loopback 0
R1(config)#ipv6 route ::/0 loopback 0

R1(config)#ip dhcp excluded-address 10.19.8.1 10.19.8.52
R1(config)#ip dhcp pool VLAN2-Bikes
R1(dhcp-config)#network 10.19.8.0 255.255.255.192
R1(dhcp-config)#default-router 10.19.8.1
R1(dhcp-config)#domain-name ccna-a.net
R1(dhcp-config)#exit

R1(config)#ip dhcp excluded-address 10.19.8.65 10.19.8.84
R1(config)#ip dhcp pool VLAN3-Trikes
R1(dhcp-config)#network 10.19.8.64 255.255.255.224
R1(dhcp-config)#default-router 10.19.8.65
R1(dhcp-config)#domain-name ccna-b.net
R1(dhcp-config)#
```

Step 2: Configure host computers.

Configure the host computers PC-A and PC-B to use DHCP for IPv4 and statically assign the IPv6 GUA and
Link Local addresses. After configuring each host computer, record the host network settings

with the
`ipconfig /all` command.
On PCs, go to Command Promt (cmd), Enter `ipconfig /renew` to request IP DMCP

PC-A Network Configuration (2 points)
Description
Physical Address
IP Address
Subnet Mask
Default Gateway
IPv6 Default Gateway

PC-B Network Configuration (2 points)
Description
Physical Address
IP Address
Subnet Mask
Default Gateway
IPv6 Default Gateway

Points for Step 1 (16 points):

Points for Step 2 (4 points):

Instructor Sign-off Part 3:
Instructor Sign-off
Total Points for Part 3 (20 points)

Part 4: Test and Verify End-to-End Connectivity

- **Total points: 5**
- **Time: 10 minutes**

Use the ping command to test IPv4 and IPv6 connectivity between all network devices.
Note: If pings to host computers fail, temporarily disable the computer firewall and retest.
Use the following table to methodically verify connectivity with each network device. Take

corrective action to establish connectivity if a test fails:

From	To	Protocol	IP Address	Ping Results
PC-A	R1, G0/0/1.2	IPv4	10.19.8.1	
	R1, G0/0/1.2	IPv6	2001:db8:acad:a::1	
	R1, G0/0/1.3	IPv4	10.19.8.65	
	R1, G0/0/1.3	IPv6	2001:db8:acad:b::1	
	R1, G0/0/1.4	IPv4	10.19.8.97	
	R1, G0/0/1.4	IPv6	2001:db8:acad:c::1	
	S1, VLAN 4	IPv4	10.19.8.98	
	S1, VLAN 4	IPv6	2001:db8:acad:c::98	
	S2, VLAN 4	IPv4	10.19.8.99.	
	S2, VLAN 4	IPv6	2001:db8:acad:c::99	
	PC-B	IPv4	IP address will vary.	
		IPv6	2001:db8:acad:b::50	
	R1 Loop0	IPv4	209.165.201.1	
		IPv6	2001:db8:acad:209::1	
PC-B	R1 Loop0	IPv4	209.165.201.1	
		IPv6	2001:db8:acad:209::1	
	R1, G0/0/1.2	IPv4	10.19.8.1	
		IPv6	2001:db8:acad:a::1	
	R1, G0/0/1.3	IPv4	10.19.8.65	
		IPv6	2001:db8:acad:b::1	
	R1, G0/0/1.4	IPv4	10.19.8.97	
		IPv6	2001:db8:acad:c::1	
	S1, VLAN 4	IPv4	10.19.8.98	
		IPv6	2001:db8:acad:c::98	

From	To	Protocol	IP Address	Ping Results
	S2, VLAN 4	IPv4	10.19.8.99.	
		IPv6	2001:db8:acad:c::99	

Instructor Sign-off Part 4:
Instructor Sign-off
Total Points for Part 4 (5 points)
Enter score here.

Part 5: Cleanup

NOTE: DO NOT PROCEED WITH CLEANUP UNTIL YOUR INSTRUCTOR HAS GRADED YOUR SKILLS EXAM AND HAS INFORMED YOU THAT YOU MAY BEGIN CLEANUP.

Unless directed otherwise by the instructor, restore host computer network connectivity, and then turn off power to the host computers.

Before turning off power to the router and switch, remove the NVRAM configuration files (if saved) from both devices.

Disconnect and neatly put away all LAN cables that were used in the Final.

Router Interface Summary Table

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)

Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
4221	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
4300	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)

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.

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