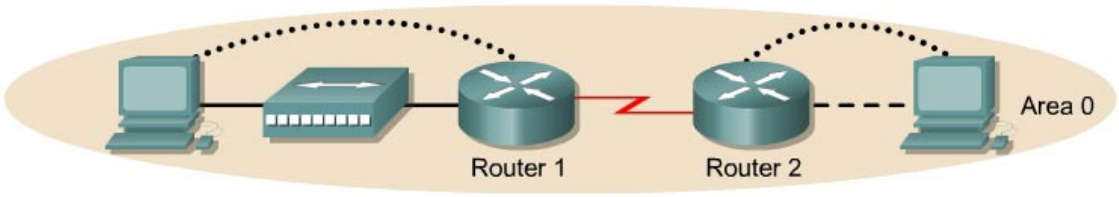
Lab 2.3.4 Configuring OSPF Authentication – 2500 Series



Router Designation	Router Name	Enable Secret Password	Enable, VTY, and Console Passwords	Routing Protocol	Network Statements
Router 1	Dublin	class	cisco	OSPF	192.168.1.0
Router 2	Washington	class	cisco	OSPF	192.168.1.0 192.168.0.0

Router Designation	IP Host Table Entry	FastEthernet 0 Address/ Subnet Mask	Interface Type Serial 0	Serial 0 Address/Subnet Mask	Interface Type Serial 1	Loopback 0 Address/Subnet Mask
Router 1	Washington	192.168.1.129/26	DCE	192.168.1.1/30	NA	192.168.31.11/32
Router 2	Dublin	192.168.0.1/24	DTE	192.168.1.2/30	NA	192.168.31.22/32

Note: The IP Host Table Entry column contents indicate the name(s) of the other router(s) in the IP host table.

Objective

- Setup an IP addressing scheme for Open Shortest Path First (OSPF) area.
- Configure and verify OSPF routing.
- Introduce OSPF authentication into the area.

Background/Preparation

Cable a network similar to the one shown in the diagram. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 2500, and 2600 or any such combination can be used. Please refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Perform the following steps on each router unless specifically instructed otherwise.

Start a HyperTerminal session.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on all routers in this lab assignment before continuing.

Step 1 Configure the routers

On the routers, enter the global configuration mode and configure the hostname, console, virtual terminal and enable secret passwords. Next configure the interfaces and IP hostnames according to

the chart. Do not configure the routing protocol until specifically told to. If there are any problems configuring the router basics, refer to the lab “Review of Basic Router Configuration with RIP”.

Router 1

```
Router#configure terminal
Router(config)#hostname Dublin

Dublin(config)#enable secret class
Dublin(config)#line console 0
Dublin(config-line)#password cisco
Dublin(config-line)#login
Dublin(config-line)#line vty 0 4
Dublin(config-line)#password cisco
Dublin(config-line)#login
Dublin(config-line)#exit
Dublin(config)#interface loopback 0
Dublin(config-if)#ip address 192.168.31.11 255.255.255.255
Dublin(config-if)#interface serial 0
Dublin(config-if)#ip address 192.168.1.1 255.255.255.252
Dublin(config-if)#clockrate 64000
Dublin(config-if)#no shutdown
Dublin(config-if)#interface ethernet 0
Dublin(config-if)#ip address 192.168.1.129 255.255.255.192
Dublin(config-if)#no shutdown
Dublin(config-if)#exit
Dublin(config)#ip host Washington 192.168.0.1 192.168.1.2
Dublin(config)#exit
```

Router 2

```
Router>enable
Router#configure terminal
Router(config)#hostname Washington

Washington(config)#enable secret class
Washington(config)#line console 0
Washington(config-line)#password cisco
Washington(config-line)#login
Washington(config-line)#line vty 0 4
Washington(config-line)#password cisco
Washington(config-line)#login
Washington(config-line)#exit
Washington(config)#interface loopback 0
Washington(config-if)#ip address 192.168.31.22 255.255.255.255
Washington(config-if)#interface serial 0
Washington(config-if)#ip address 192.168.1.2 255.255.255.252
Washington(config-if)#no shutdown
Washington(config-if)#interface ethernet 0
Washington(config-if)#ip address 192.168.0.1  255.255.255.0
Washington(config-if)#no shutdown
Washington(config-if)#exit
Washington(config)#ip host Dublin 192.168.1.129 192.168.1.1
Washington(config)#exit
```

Step 2 Save the configuration information from the privileged EXEC command mode

```
Dublin#copy running-config startup-config
Destination filename [startup-config]? [Enter]

Washington#copy running-config startup-config
```



```
Destination filename [startup-config]? [Enter]
```

Why save the running configuration to the startup configuration?

Saving the configuration will allow the router to keep the configuration after a reload or power down.

Step 3 Configure the hosts with the proper IP address, subnet mask and default gateway

a. Each workstation should be able to ping the attached router. Troubleshoot as necessary. Remember to assign a specific IP address and default gateway to the workstation. If running Windows 9x/ME, check by using **Start** > **Run** > **winipcfg**. If running Windows NT/2000/XP, check by using the **ipconfig** command in a Command Prompt window.

b. At this point the workstations will not be able to communicate with each other. The following steps will demonstrate the process required to get communication working using OSPF as the routing protocol.

```
Host connected to router Dublin
IP Address:              92.168.1.130
Subnet mask:             255.255.255.192
Default gateway:         192.168.1.129

Host connected to router Washington
IP Address:              192.168.0.2
Subnet mask:             255.255.255.0
Default gateway:         192.168.0.1
```

Step 4 Verify connectivity

a. On a router, ping the serial interface of the other router.

b. What the ping successful? Yes

c. If the ping was not successful, troubleshoot the routers configurations, until the ping is successful.

Step 5 Configure OSPF routing on both routers

a. Configure OSPF routing on each router. Use OSPF process number 1 and ensure all networks are in area 0. Refer to the lab, “Configuring Loopback Interfaces” for review on configuring OSPF routing if necessary.

```
Dublin(config)#router ospf 1
Dublin(config-router)#network 192.168.1.128 0.0.0.127 area 0
Dublin(config-router)#network 192.168.1.0 0.0.0.3 area 0
Dublin(config-router)#end

Washington(config)#router ospf 1
Washington(config-router)#network 192.168.0.0 0.0.0.255 area 0
Washington(config-router)#network 192.168.1.0 0.0.0.3 area 0
Washington(config-router)#end
```

b. Examine the Dublin router running configuration file. Did the IOS version automatically add any lines under router OSPF 1? Yes

c. Show the routing table for the Dublin router.

```
Dublin#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
       BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
```



```
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
        inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

C       192.168.31.11 is directly connected, Loopback0
O       192.168.0.0/24 [110/51] via 192.168.1.2, 00:24:21, Serial0
        192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/30 is directly connected, Serial0
C       192.168.1.128/26 is directly connected, Ethernet0
```

d. Are there any entries in the routing table?

e. Why?

Yes, because a routing protocol has been configured and routing updates are being made.

Step 6 Test network connectivity

a. Ping the Dublin host from the Washington host. Was it successful? Yes

b. If not troubleshoot as necessary.

Step 7 Setup up OSPF authentication

a. OSPF authentication is being established on the routers in the network. First, introduce authentication only on the Dublin router.

b. In the interface configuration mode on Serial 0, enter the command **ip ospf message-digest-key 1 md5 7 asecret**.

```
Dublin(config)#interface Serial 0
Dublin(config-if)#ip ospf message-digest-key 1 md5 ?
<0-7> Encryption type (0 for not yet encrypted, 7 for proprietary)
Dublin(config-if)#ip ospf message-digest-key 1 md5 7 ?
LINE The OSPF password (key)
Dublin(config-if)#ip ospf message-digest-key 1 md5 7 asecret
```

c. What is the OSPF password being used for md5 authentication? asecret

d. What encryption type is being used? Type 7

Step 8 Enable OSPF authentication in this area, area 0

```
Dublin(config-if)#router ospf 1
Dublin(config-router)#area 0 authentication message-digest
```

a. Wait for a few seconds. Does the router generate any output? Yes

b. Enter the command **show ip ospf neighbor**.

c. Are there any OSPF neighbors? No

d. Examine the routing table by entering **show ip route**.

e. Are there any OSPF routes in the Dublin router routing table? No

f. Can the Dublin host ping the Washington host? No

g. Enter these configuration commands, one per line. End with CNTL/Z.


```
Washington#configure terminal
Washington(config)#interface serial 0
Washington(config-if)#ip ospf message-digest-key 1 md5 7 asecret
Washington(config-if)#router ospf 1
Washington(config-router)#area 0 authentication message-digest
```

h. Verify that there is an OSPF neighbor by entering **show ip ospf neighbor** command.

```
Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.1.129     1   FULL/  -        00:00:38    192.168.1.1     Serial0
```

i. Show the routing table by typing **show ip route**.

```
Washington#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
       BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
       inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C       192.168.31.22 is directly connected, Loopback0
C       192.168.0.0/24 is directly connected, Ethernet0
        192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/30 is directly connected, Serial0
O       192.168.1.128/26 [110/791] via 192.168.1.1, 00:25:14, Serial0
```

j. Ping the Washington host from Dublin. If this was not successful troubleshoot as necessary.

Once the previous steps are completed, log off by typing **exit** and turn the router off. Then remove and store the cables and adapter.

Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

If prompted for a password, enter **class**. If that does not work, ask the instructor for assistance.

```
Router>enable
```

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

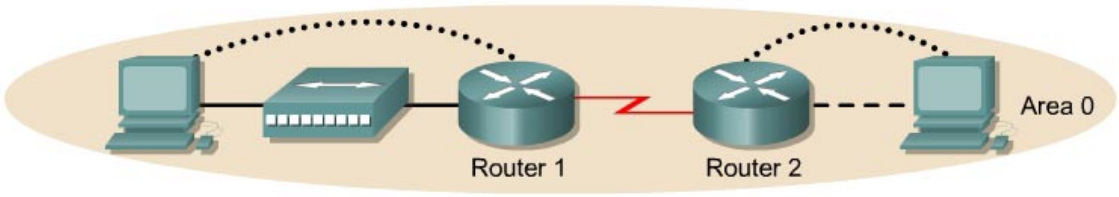
```
Press RETURN to get started!
```

Press **Enter**.

Now the router is ready for the assigned lab to be performed.

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
In order to find out exactly how the router is configured, look at the interfaces. This will identify what type and how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart 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 IOS command to represent the interface.				

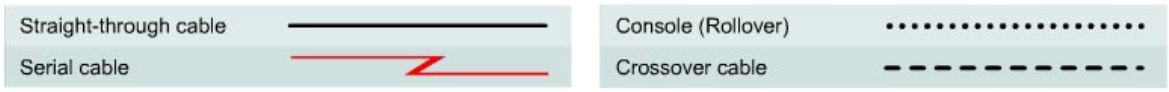
Lab 2.3.4 Configuring OSPF Authentication – 2600 Series



Router Designation	Router Name	Enable Secret Password	Enable, VTY, and Console Passwords	Routing Protocol	Network Statements
Router 1	Dublin	class	cisco	OSPF	192.168.1.0
Router 2	Washington	class	cisco	OSPF	192.168.1.0 192.168.0.0

Router Designation	IP Host Table Entry	FastEthernet 0 Address/ Subnet Mask	Interface Type Serial 0	Serial 0 Address/Subnet Mask	Interface Type Serial 1	Loopback 0 Address/Subnet Mask
Router 1	Washington	192.168.1.129/26	DCE	192.168.1.1/30	NA	192.168.31.11/32
Router 2	Dublin	192.168.0.1/24	DTE	192.168.1.2/30	NA	192.168.31.22/32

Note: The IP Host Table Entry column contents indicate the name(s) of the other router(s) in the IP host table.



Objective

- Setup an IP addressing scheme for Open Shortest Path First (OSPF) area.
- Configure and verify OSPF routing.
- Introduce OSPF authentication into the area.

Background/Preparation

Cable a network similar to the one shown in the diagram. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 2500, and 2600 or any such combination can be used. Please refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Perform the following steps on each router unless specifically instructed otherwise.

Start a HyperTerminal session.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on all routers in this lab assignment before continuing.

Step 1 Configure the routers

On the routers, enter the global configuration mode and configure the hostname, console, virtual terminal and enable secret passwords. Next configure the interfaces and IP hostnames according to

the chart. Do not configure the routing protocol until specifically told to. If there are any problems configuring the router basics, refer to the lab “Review of Basic Router Configuration with RIP”.

Router 1

```
Router>enable
Router#configure terminal
Router(config)#hostname Dublin

Dublin(config)#enable secret class
Dublin(config)#line console 0
Dublin(config-line)#password cisco
Dublin(config-line)#login
Dublin(config-line)#line vty 0 4
Dublin(config-line)#password cisco
Dublin(config-line)#login
Dublin(config-line)#exit
Dublin(config)#interface loopback 0
Dublin(config-if)#ip address 192.168.31.11 255.255.255.255
Dublin(config-if)#interface serial 0/0
Dublin(config-if)#ip address 192.168.1.1 255.255.255.252
Dublin(config-if)#clockrate 64000
Dublin(config-if)#no shutdown
Dublin(config-if)#interface fastethernet 0/0
Dublin(config-if)#ip address 192.168.1.129 255.255.255.192
Dublin(config-if)#no shutdown
Dublin(config-if)#exit
Dublin(config)#ip host Washington 192.168.0.1 192.168.1.2
Dublin(config)#exit
```

Router 2

```
Router>enable
Router#configure terminal
Router(config)#hostname Washington

Washington(config)#enable secret class
Washington(config)#line console 0
Washington(config-line)#password cisco
Washington(config-line)#login
Washington(config-line)#line vty 0 4
Washington(config-line)#password cisco
Washington(config-line)#login
Washington(config-line)#exit
Washington(config)#interface loopback 0
Washington(config-if)#ip address 192.168.31.22 255.255.255.255
Washington(config-if)#interface serial 0/0
Washington(config-if)#ip address 192.168.1.2 255.255.255.252
Washington(config-if)#no shutdown
Washington(config-if)#interface fastethernet 0/0
Washington(config-if)#ip address 192.168.0.1  255.255.255.0
Washington(config-if)#no shutdown
Washington(config-if)#exit
Washington(config)#ip host Dublin 192.168.1.129 192.168.1.1
Washington(config)#exit
```

Step 2 Save the configuration information from the privileged EXEC command mode

```
Dublin#copy running-config startup-config
Destination filename [startup-config]? [Enter]
```



```
Washington#copy running-config startup-config
Destination filename [startup-config]? [Enter]
```

Why save the running configuration to the startup configuration?

Saving the configuration will allow the router to keep the configuration after a reload or power down.

Step 3 Configure the hosts with the proper IP address, subnet mask and default gateway

a. Each workstation should be able to ping the attached router. Troubleshoot as necessary. Remember to assign a specific IP address and default gateway to the workstation. If running Windows 9x/ME, check by using **Start** > **Run** > **winipcfg**. If running Windows NT/2000/XP, check by using the **ipconfig** command in a Command Prompt window.

b. At this point the workstations will not be able to communicate with each other. The following steps will demonstrate the process required to get communication working using OSPF as the routing protocol.

```
Host connected to router Dublin
IP Address:              192.168.1.130
Subnet mask:             255.255.255.192
Default gateway:         192.168.1.129

Host connected to router Washington
IP Address:              192.168.0.2
Subnet mask:             255.255.255.0
Default gateway:         192.168.0.1
```

Step 4 Verify connectivity

a. On a router, ping the serial interface of the other router.

b. What the ping successful? Yes

c. If the ping was not successful, troubleshoot the routers configurations, until the ping is successful.

Step 5 Configure OSPF routing on both routers

a. Configure OSPF routing on each router. Use OSPF process number 1 and ensure all networks are in area 0. Refer to the lab, “Configuring Loopback Interfaces” for review on configuring OSPF routing if necessary.

```
Dublin(config)#router ospf 1
Dublin(config-router)#network 192.168.1.128 0.0.0.127 area 0
Dublin(config-router)#network 192.168.1.0 0.0.0.3 area 0
Dublin(config-router)#end

Washington(config)#router ospf 1
Washington(config-router)#network 192.168.0.0 0.0.0.255 area 0
Washington(config-router)#network 192.168.1.0 0.0.0.3 area 0
Washington(config-router)#end
```

b. Examine the Dublin router running configuration file. Did the IOS version automatically add any lines under router OSPF 1? Yes

c. Show the routing table for the Dublin router.

```
Dublin#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
       BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
```



```
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
        inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

C       192.168.31.11 is directly connected, Loopback0
O       192.168.0.0/24 [110/51] via 192.168.1.2, 00:14:23, Serial0/0
        192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/30 is directly connected, Serial0/0
C       192.168.1.128/26 is directly connected, FastEthernet0/0
```

d. Are there any entries in the routing table?

e. Why?

Yes, because a routing protocol has been configured and routing updates are being made.

Step 6 Test network connectivity

a. Ping the Dublin host from the Washington host. Was it successful? Yes

b. If not troubleshoot as necessary.

Step 7 Setup up OSPF authentication

a. OSPF authentication is being established on the routers in the network. First, introduce authentication only on the Dublin router.

b. In the interface configuration mode on Serial 0, enter the command **ip ospf message-digest-key 1 md5 7 asecret**.

```
Dublin(config)#interface Serial 0
Dublin(config-if)#ip ospf message-digest-key 1 md5 ?
<0-7> Encryption type (0 for not yet encrypted, 7 for proprietary)
Dublin(config-if)#ip ospf message-digest-key 1 md5 7 ?
LINE The OSPF password (key)
Dublin(config-if)#ip ospf message-digest-key 1 md5 7 asecret
```

c. What is the OSPF password being used for md5 authentication? asecret

d. What encryption type is being used? Type 7

Step 8 Enable OSPF authentication in this area, area 0

```
Dublin(config-if)#router ospf 1
Dublin(config-router)#area 0 authentication message-digest
```

a. Wait for a few seconds. Does the router generate any output? Yes

b. Enter the command **show ip ospf neighbor**.

c. Are there any OSPF neighbors? No

d. Examine the routing table by entering **show ip route**.

e. Are there any OSPF routes in the Dublin router routing table? No

f. Can the Dublin host ping the Washington host? No

g. Enter these configuration commands, one per line. End with CNTL/Z.


```
Washington#configure terminal
Washington(config)#interface serial 0
Washington(config-if)#ip ospf message-digest-key 1 md5 7 asecret
Washington(config-if)#router ospf 1
Washington(config-router)#area 0 authentication message-digest
```

h. Verify that there is an OSPF neighbor by entering **show ip ospf neighbor** command.

```
Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.1.129     1   FULL/  -        00:00:38    192.168.1.1     Serial0
```

i. Show the routing table by typing **show ip route**.

```
Washington#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
       BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
       inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C       192.168.31.22 is directly connected, Loopback0
C       192.168.0.0/24 is directly connected, FastEthernet0/0
        192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/30 is directly connected, Serial0/0
O       192.168.1.128/26 [110/791] via 192.168.1.1, 00:18:41, Serial0/0
```

j. Ping the Washington host from Dublin. If this was not successful troubleshoot as necessary.

Once the previous steps are completed, log off by typing **exit** and turn the router off. Then remove and store the cables and adapter.

Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

If prompted for a password, enter **class**. If that does not work, ask the instructor for assistance.

```
Router>enable
```

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started!
```

Press **Enter**.

Now the router is ready for the assigned lab to be performed.

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
In order to find out exactly how the router is configured, look at the interfaces. This will identify what type and how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart 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 IOS command to represent the interface.				

