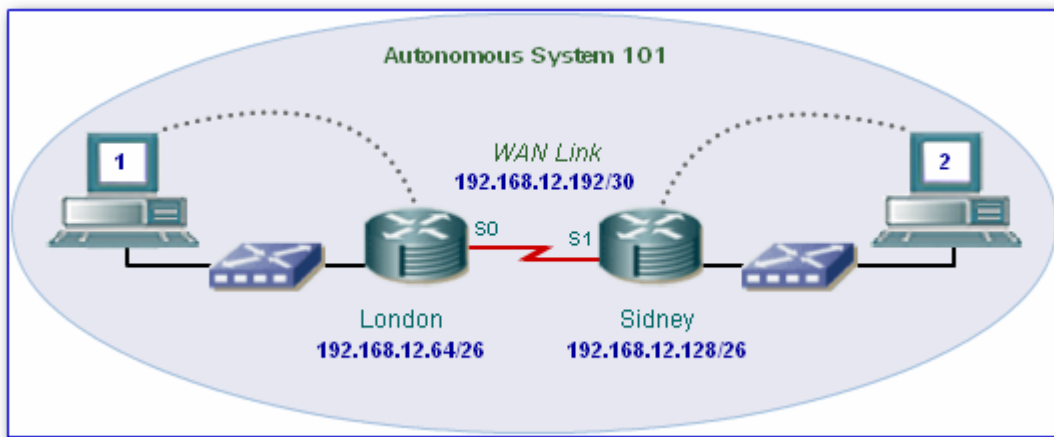


Portfolio Exercise 2c: Configure and Verify EIGRP on a Router

Objectives

- Configure and verify EIGRP on a router
- *Collect portfolio evidence for part of Grading Criteria P2*

Scenario



A network has two LAN's linked together via a single WAN link. The LAN IP addressing schemes are as follows

- o **London** → 192.168.12.64/26
- o **Sydney** → 192.168.12.128/26
- o **Wan Link** → 192.168.12.192/30

You are required to configure each router with the EIGRP routing protocol and verify the correct operation of the protocol.

Task 1: Document the Configuration

a. Specify the configuration of the routers and the hosts

Using the diagram above for reference, fill in the table below. Some of the detail such as the ports you may decide for yourself.

| | Name | Eth Port No | Eth Port IP address + CIDR subnet mask | Serial Port No. | Serial Port IP address + CIDR subnet mask |
|-----------------|------|-------------|--|-----------------|---|
| Router 1 | | | | | |
| Router 2 | | | | | |

Which router will be the DCE? _____

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Decide on IP addresses for the hosts and fill the table below:-

| | IP Address | Subnet Mask | Default Gateway |
|---------------|------------|-------------|-----------------|
| Host 1 | | | |
| Host 2 | | | |

Task 2: Configure the Routers and Hosts

You will need to configure the router as follows:-

- Set the router name
- Set the enable, console and VTY passwords
- Configure the Ethernet port with an IP address and subnet mask.
- Configure the Serial port with an IP address and subnet mask.
- Set the DCE serial port's clock rate

a. Configure the routers

As a reminder, the various configuration commands are specified below. You will need remember which mode to be in for yourself, e.g. global configuration mode etc.

Set the router's name using the **hostname** command

Set the enable password using the **enable secret** command

Set the line console and vty passwords using the **password** and **login** command

Set the IP address and subnet mask on the Ethernet port using the **ip address** command and activate the port using the **no shutdown** command

Set the IP address and subnet mask on the Serial port using the **ip address** and command activate the port using the **no shutdown** command.

Set the clock rate on the **DCE** serial port using the **clock rate** command

b. Configure the hosts

Configure each host with the IP address, subnet mask and default gateway as specified in your documentation.

c. Verify Connectivity

If you have configured the routers and hosts correctly you should be able to ping between the following devices:-

- Ping Host 1 from Router 1
- Ping Host 2 from Router 2
- Ping Router 1 serial interface from Router 2
- Ping Router 2 serial interface from Router 1

*Don't forget to save your configuration using the **copy run start** command*

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Task 3: Configure EIGRP Routing

You will need to configure EIGRP routing on the routers so that hosts on one LAN can communicate with hosts on the other LAN. You will need to go to the proper command mode to configure EIGRP routing.

- a. Configure EIGRP routing on the London Router

Choosing the London router to configure first, use the Autonomous System number of 101.

```
London(config)#router eigrp 101
London(config-router)#network 192.168.12.0
```

What does the Autonomous System number represent?

- b. Configure EIGRP routing on the Sydney Router

Now choosing to configure the Sydney, again use the Autonomous System number of 101.

```
Sidney(config)#router eigrp 101
Sidney (config-router)#network 192.168.12.0
```

Is EIGRP a classless or classful routing protocol? _____

Can EIGRP cope with variable length subnet masks? _____

Is EIGRP a distance-vector or link-state routing protocol or some other type?

*Don't forget to save your configuration using the **copy run start** command*

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c. Verify OSPF routing on the routers

*Now you have finished configuring the routers, you can check your configuration using the **sh run** and **sh ip route** commands.*

How many routing entries do you think you should see in the routing table? _____

Some of the routes in the routing table should show a **C** in the first column. Explain what this means.

What if the routes show a **D** in the first column? What does this mean?

Are there any EIGRP entries in the routing table? _____

If your routing table does not show the correct entries then you will need to troubleshoot and fix your configuration appropriately.

Now check your router configuration using the ping command on each host

Ping **Host1** from **Host2**. Was the ping successful? _____

Ping **Host2** from **Host1**. Was the ping successful? _____

If the answer is no for either question, troubleshoot the router configurations to find the error. Then do the pings again until the answer to both questions is yes.

Evidence

Please supply the following evidence to support your implementation of this task

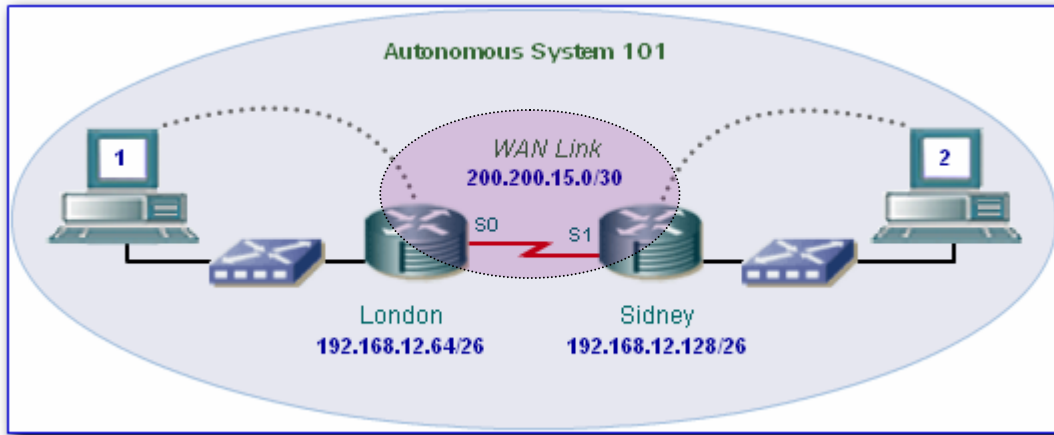
~~Screenshots and configuration files required~~

- Printout of one of the router's configuration file. Annotate the printout, pointing out and explaining the EIGRP routing configuration
- Printout showing the routing table. Annotate the printout, pointing out and explaining the routing table entries, e.g. which networks are directly connected and which have been discovered though EIGRP.
- Screenshots showing the **ipconfig/all** and **ping** results for each host

Please annotate, sign, date, put the portfolio exercise number and task number on all evidence pages

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Part 2 – A Discontiguous Network



The network you previously configured has changed. The WAN link between the two LAN's has a new addressing scheme. The IP addressing schemes is now as follows

- o **London** → 192.168.12.64/26
- o **Sydney** → 192.168.12.128/26
- o **Wan Link** → 200.200.15.0/30

You are required to configure each router with the new addressing scheme and verify correct operation of the EIGRP routing protocol. You should note that the new addressing scheme introduces a discontiguous link between the two LAN's. It is likely that this will cause problems with the EIGRP routing process, which automatically summarizes routes across any major network boundaries.

Task 4: Change the Addressing Scheme and Reconfigure the Routers

You will need to decide on the new IP addresses for the WAN serial links.

- a. Document the new addressing scheme

Decide on appropriate new IP addresses and subnet masks for the WAN serial links. Fill in the table below with this information:-

| | Name | Serial Port No. | Serial Port IP address + CIDR subnet mask |
|-----------------|------|-----------------|---|
| Router 1 | | | |
| Router 2 | | | |

You will also have to change your **network** statements. Write down the new network statements for each router in the table below:-

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| | Name | Network statements |
|-----------------|------|--------------------|
| Router 1 | | |
| Router 2 | | |

b. Reconfigure the routers

Configure the routers with their new serial IP addresses and subnet masks and change the **network** statements appropriately.

Reset the routing table by using the **ip route clear *** command

*Don't forget to save your configuration using the **copy run start** command*

c. Verify basic connectivity

Check your configuration using ping. The following devices should be able to ping each other:-

- Ping Host 1 from Router 1
- Ping Host 2 from Router 2
- Ping Router 1 serial interface from Router 2
- Ping Router 2 serial interface from Router 1

You should not be able to ping hosts on the separate LAN's. Try it.

Ping **Host1** from **Host2**. Was the ping successful? _____

Ping **Host2** from **Host1**. Was the ping successful? _____

Examine the routing tables on each router. Do they look correct? _____

Are there any EIGRP entries in the routing table? _____

d. Turn off Auto-Summary

By default, EIGRP will automatically summarize routes across any major network boundaries.

What will the auto-summary address of the London LAN be? _____

What will the auto-summary address of the Sydney LAN be? _____

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Explain what will happen when say the London router receives the auto-summary address in a routing update from the Sydney router

Turn off auto-summary on each router by issuing the following commands.

```
(config)#router eigrp 101
(config-router)#no auto-summary
```

Reset the routing table by using the **clear ip route *** command

Examine the routing tables on each router. Do they look different? _____

Are there any EIGRP entries in the routing table? _____

Now check the connectivity between the hosts on the separate LAN's.

Ping **Host1** from **Host2**. Was the ping successful? _____

Ping **Host2** from **Host1**. Was the ping successful? _____

If the answer is no for either question, troubleshoot the router configurations to find the error. Then do the pings again until the answer to both questions is yes.

e. Check the neighbors table

From each router, use the **show ip eigrp neighbors** command to see which neighbors are connected to the router.

Can you see any neighbors? If so, how many? _____

f. Check the topology table

To view the topology table, use the **show ip eigrp topology all-links** command.

You can view more specific information about a topology table entry by using an IP address.

From the London router, try the following

```
show ip eigrp topology ip_address_of_Sidney_router
```

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From the Sidney router, try the following

```
show ip eigrp topology ip_address_of_London_router
```

What does the output of this command tell you? _____

g. Check the EIGRP statistics

On one of the routers, use the following command to view statistics on EIGRP traffic

```
show ip eigrp traffic
```

You should be able to see how many hello packets have been sent and received.

How many hello packets have been received? _____

How many have been sent? _____

Evidence

Please supply the following evidence to support your implementation of this task

~~Screenshots and configuration files required~~

- Printout of one of the router's configuration file. Annotate the printout, pointing out and explaining the EIGRP routing configuration
- Printout showing the routing table. Annotate the printout, pointing out and explaining the routing table entries, e.g. which networks are directly connected and which have been discovered through EIGRP.
- Printout showing the results of the **show ip eigrp topology all-links** command
- Screenshots showing the **ipconfig/all** and **ping** results for each host

Please annotate, sign, date, put the portfolio exercise number and task number on all evidence pages