

UNIVERSITY OF BOLTON

**SCHOOL OF GAMES COMPUTING AND CREATIVE
TECHNOLOGY**

COMPUTING TECHNOLOGY

SEMESTER 2 EXAMINATIONS 2008/2009

ROUTING BASICS

MODULE NO: LCT1020

Date: Friday 29th May 2009

Time: 10.00am-12.00pm

INSTRUCTIONS TO CANDIDATES:

There are SIX questions.

Answer any FOUR questions.

All questions carry equal marks.

QUESTION 1

- 1a. Identify the key role and functions that are carried out by a router. Include a brief description of hardware and software components of a modern device.
(8 marks)
- 1b. Explain the procedure for password recovery associated with Cisco routers. Assume that the Router is a Cisco 2600, and that typical configuration register settings are used. You must include the precise router commands and expected outcomes for each stage.
(12 marks)
- 1c. Describe using IOS SHOW commands how you would discover details about a routers configuration. You must include details that divulge the following: configuration register setting, interfaces, protocols, start configuration and routes.
(5 marks)

QUESTION 2

- 2a. When troubleshooting two routers that are not communicating, what checks and tests can be carried out by the administrator?
(8 Marks)
- 2b. Explain what Cisco Discovery Protocol is and what kind of information can be obtained from its use. Give examples of how to invoke CDP globally across the whole router and on a per interface basis.
(7 marks)
- 2c. Describe what backup procedures you would implement in a Cisco based Router Network to safeguard loss of configuration data. Describe any commands used to save data.
(6 marks)
- 2d. How can telnet sessions be started from a Router> prompt? Give several examples.
(4 marks)

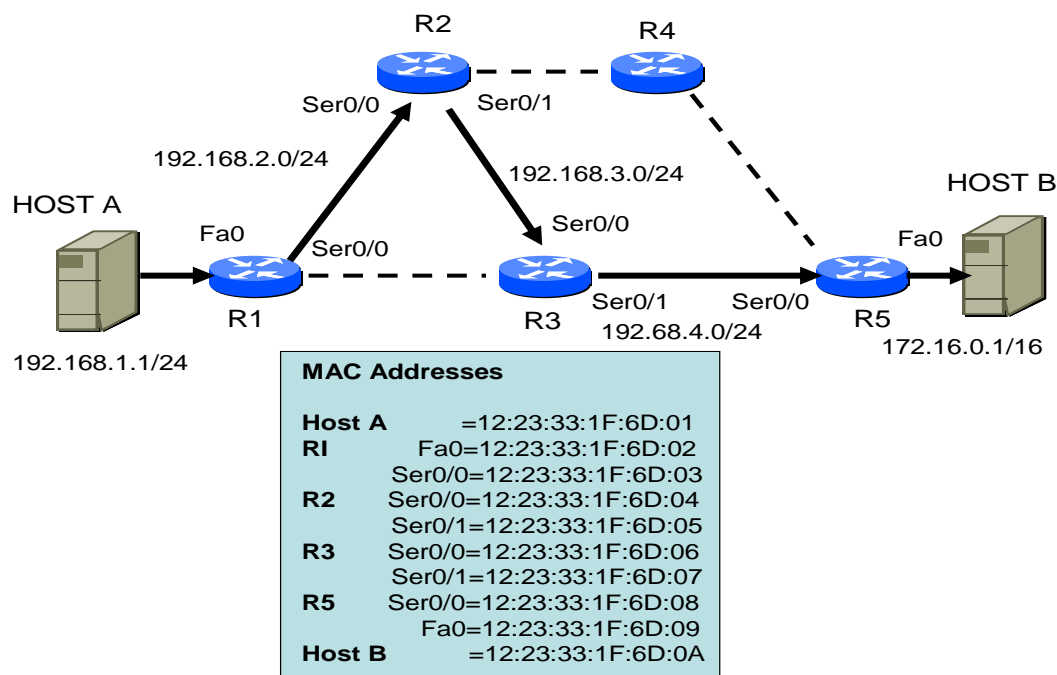
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QUESTION 3

- 3a. Describe and explain the various components of a router. You should include a description of the different types of memory used and what their purpose is. **(8 marks)**
- 3b. Explain the role of the Cisco Internetwork Operating system. Give details of various modes that are used and what can be achieved at each level. **(7 marks)**
- 3c. Explain in detail how a router operates from an incoming received packet to the sending on to the next hop. You must include details of the internal functions of a router for example static routes and routing tables. **(10 marks)**

QUESTION 4

- 4a. Describe what is meant by encapsulation and de-encapsulation associated with a router network. Use as your guide the router network shown below. Discuss the process of encapsulation and de-encapsulation as a packet traverses from HOST A to Host B. You must include details of IP packet and Ethernet frame address parameters. **(8 marks)**



QUESTION 4 CONTINUED OVER THE PAGE

QUESTION 4 CONTINUED

- 4b. Explain the key parameters associated with TCP Transmissions such as Telnet and FTP. Show how layer 4 ports allow multiple conversations to take place between a server and numerous clients and how UDP differs from TCP. Give data traffic examples of both FTP and UDP
(10 marks)
- 4c. Describe how TCP based protocol can establish a connection and close down gracefully once data has been transferred successfully.
(7 marks)

QUESTION 5

- 5a. Give details of how an interactive session can be established with the console port of a router and a serial port of a pc. Include in your description the set-up parameters of the serial link. What other access methods could be used?
(7 marks)
- 5b. Given the address and subnet mask of 172.16.0.0/13. What does this mean in terms of address space.
(6 marks)
- 5c. Describe how Distance Vector routing protocols operate. Include a comparison with Link state protocols using examples.
(6 marks)
- 5d. Using RIP v1 as an example, give details of how Routers can avoid receiving misleading route information from neighbouring routers.
(6 marks)

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QUESTION 6

- 6a. Describe using IOS commands how you would configure a basic set up of a Cisco router. You should include the following: Hostname, Banner MOTD, Telnet login, Secure Password, LAN interface and WAN interface. You can assume the WAN interface requires a clock.

(10 marks)

- 6b. What is VLSM used for? Consider this example: a class B address 166.16.0.0 is used to support a network of 210 sites, maximum of 100 hosts per site with a total including growth of 396 point to point WAN links.

Can a Class B address support this? and if not specify how VLSM can.

(8 marks)

- 6c. Discuss the use of Static and Dynamic routes in a Cisco router. Include details of the different ways Static routes can be applied. Include in your discussion terms such as Administrative Distance and how this affects the operation of routing functionality.

(7 marks)

END OF QUESTIONS