Network Infrastructure Technician Competition

Pre-competition Activity

Introduction

VLSM & Network Configuration

What you should have:

- 2 separate papers, 1 paper per session
- Blank paper
- Pens/Pencils
- Pre-populated Packet Tracer file

If at any point you feel you are finished and you leave your station, you may not come back and continue work.

If you cross through any work it will not be marked.

If you feel that you require assistance, possibly due to a suspected hardware failure, please put your hand up and inform a judge.

It is your responsibility to save your work on a regular basis. If packet tracer crashes during your attempt you may have to restart if you don't regularly back up your work.

Any backups should be saved to the computer you are working on.

No personal storage devices or mobile phones are allowed in or around your workstation during the competition.

Task	Description	% Weighting
1	VLSM & Network Configuration	50%

General Task Information

- Using the diagrams (Appendix 1), complete this task using the provided packet tracer file **Task_.pka**.

- Save the packet tracer file onto the desktop and provided pen drive with the file name **Task_<your name>.pka**.

- *NOTE: Some of the devices in the .pka file have configurations completed and as such have been prevented from being modified.*

- In addition to the configuration requirements as detailed on the diagrams, the following details apply to the configuration of the network.

IP Addressing Scheme

- Referring to the diagram in Appendix 1, you have to design an **efficient contiguous** addressing scheme that meets the requirements stated in the table shown in Appendix1. You have been provided a table in Appendix 2 to allow you to show your calculations/workings. You should complete the table as marks will be allocated based upon the content of your table. This scheme will be required in order for you to complete TASK1.

- You have been provided with subnet 11.11.0.0/21, however you do not have access to use block 11.11.0.0/23 of this subnet. In addition to this you must design the IP Scheme in a way that will ensure that the wireless subnet/vlan has the network address of 11.11.6.0.

- **NOTE:** The external server (100.100.100.100) and the ISP/Internet router have been pre-configured and will not require any configuration by you. Your task is to configure the **MCAMPUS** router and the networks internal to the AS90.

Basic Configuration

- Host names on all routing devices
- Passwords on **MCAMPUS router and S2 Switch** devices only.
    - ✦ Console Password: **Computer**
    - ✦ VTY Password: **Processor**
    - ✦ Enable secret: **Intel**
- Enable telnet access only on **MCAMPUS**, and **S2 - only from upper half of ITManagement subnet.**
- MOTD Banner – reading, "Access to this device: <device name>, should be by authorised users only" **on MCAMPUS**
- Interface descriptions **on MCAMPUS router interfaces connected to CAMPUS1 and CAMPUS2 routers, both ends of serial connections.**
- Configure synchronous logging on **MCAMPUS** router **only**
- Configure password encryption on **MCAMPUS** router **only**
- Disable domain name resolution on **MCAMPUS** router **only**

Switching, InterVLAN routing and spanning tree requirements on CAMPUS1 and CAMPUS2:

- Use the first available address in each subnet for the fastethernet router interfaces.
- Assign the hosts in the network topology diagram to their respective VLANs.
- Configure rapid PVST Protocol on all switches.
- Configure S1 to be the root bridge for VLANs 10, 20, 30 and 40 (DFG for these VLANs to be on CAMPUS1 Router).
- Configure S3 to be the root bridge for VLANs 15, 25, and 35 (DFG for these VLANs to be on CAMPUS2 Router).
- Statically configure trunks between S1 and S2 and S3.
- Configure portfast on all other switch ports and secure VTP using VTP domain: **NITUKHEAT** and VTP password: **WSHEAT**.
- Each switch should be able to ping the relevant router interface for each VLAN. Configure S1 with the second IP address in the **ITManagement** VLAN, and S2 and S3 with the third and fourth IP address (all SVI addresses on switches should be configured statically).

EIGRP Routing

Enable the EIGRP routing protocol using **AS90**:

- Configure MCAMPUS, CAMPUS1, and CAMPUS2 for EIGRP • Configure a static default route on MCAMPUS
- Advertise a default route from MCAMPUS.
- Routing update transmission should only be between routing devices.
- Disable automatic summarisation.

DHCP

- Configure DHCP on CAMPUS1 to dynamically assign network addresses to VLANs 10, 20, 30, and 40.
- Configure DHCP on CAMPUS2 to dynamically assign network addresses to VLANs 15, 25, and 35
- Exclude the first 8 IP addresses from VLAN10 and 40. Set the DNS Server to the 2nd IP address of the assigned subnet.
- Configure a suitable DHCP pool for the ITManagement Vlan to ensure no address conflicts occur.

PPP

- Configure 2 PPP connections between MCAMPUS to CAMPUS1 and MCAMPUS to CAMPUS2. Secure PPP using CHAP authentication and the password: **53r1@l.** MCAMPUS should be configured as the DCE device, for both the CAMPUS1 and CAMPUS2 links, with a clock rate of 128Kbps.
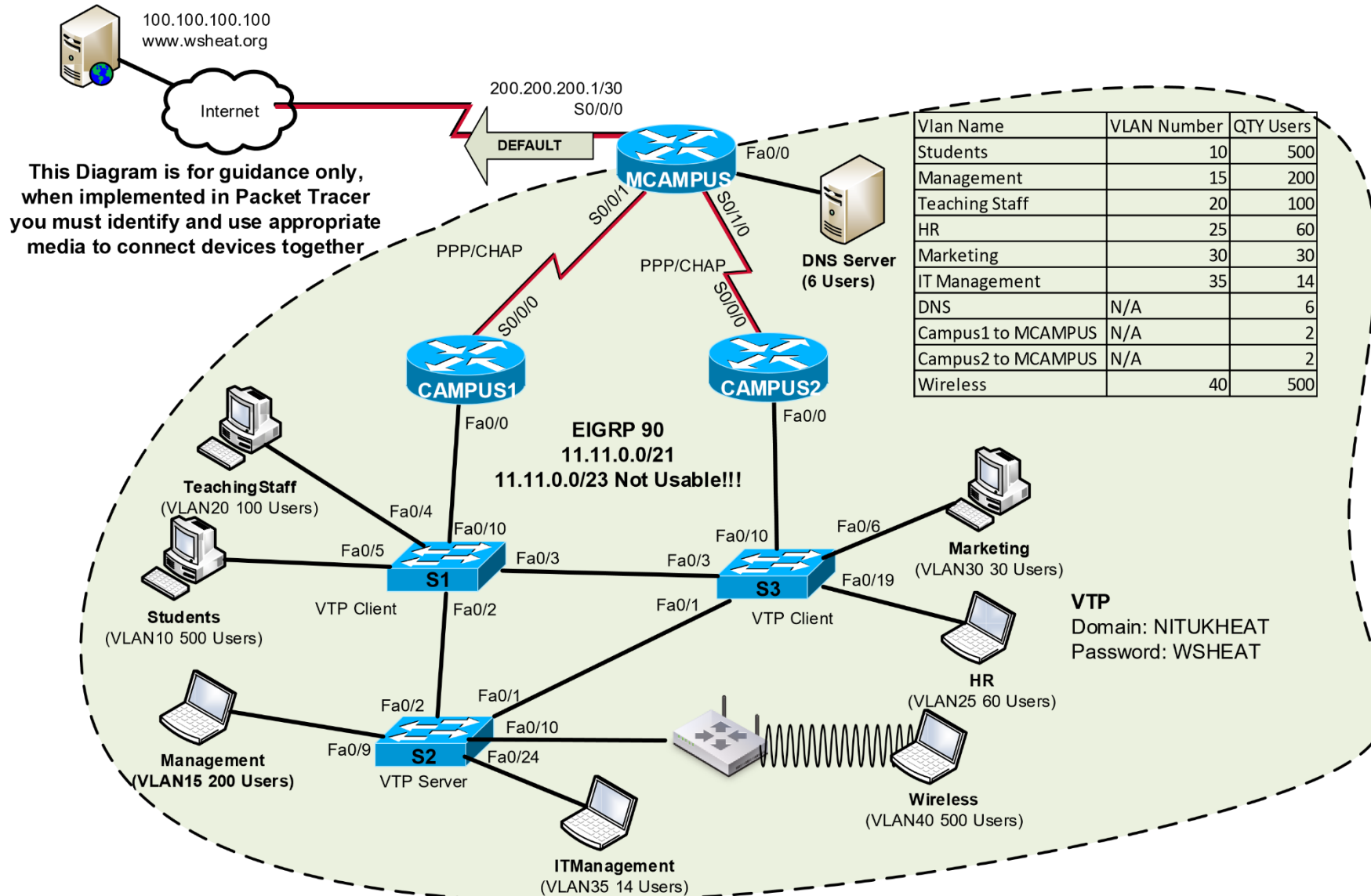
NAT Configuration

- Allow VLAN 15,20,25,30,35, and 40 external access using PAT translation on MCAMPUS.

Host Connectivity

- All Computers and Laptops shown on the topology should acquire IP addresses through DHCP and should have end to end connectivity. They should also be able to open the web page at **www.wsheat.org**

APPENDIX 1: Task 1 – Network Topology

This Diagram is for guidance only, when implemented in Packet Tracer you must identify and use appropriate media to connect devices together

Vlan Name	VLAN Number	QTY Users
Students	10	500
Management	15	200
Teaching Staff	20	100
HR	25	60
Marketing	30	30
IT Management	35	14
DNS	N/A	6
Campus1 to MCAMPUS	N/A	2
Campus2 to MCAMPUS	N/A	2
Wireless	40	500

100.100.100.100
www.wsheat.org

Internet

200.200.200.1/30
S0/0/0

DEFAULT

MCAMPUS   Fa0/0

S0/0/1   S0/1/0

PPP/CHAP   PPP/CHAP

S0/0/0   S0/0/0

DNS Server
(6 Users)

CAMPUS1   CAMPUS2

Fa0/0   Fa0/0

EIGRP 90
11.11.0.0/21
11.11.0.0/23 Not Usable!!!

Teaching Staff
(VLAN20 100 Users)

Fa0/4   Fa0/10

Fa0/5   Fa0/3   Fa0/3   Fa0/10   Fa0/6

S1   S3

Marketing
(VLAN30 30 Users)

VTP Client   Fa0/2   Fa0/1   Fa0/19

Students
(VLAN10 500 Users)

VTP Client

VTP
Domain: NITUKHEAT
Password: WSHEAT

HR
(VLAN25 60 Users)

Fa0/2   Fa0/1

Management
(VLAN15 200 Users)

Fa0/9   Fa0/10

S2   Fa0/24

VTP Server

Wireless
(VLAN40 500 Users)

ITManagement
(VLAN35 14 Users)

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Appendix 2

VLAN Name	VLAN Number	QTY Users	CIDR	Subnet Address	1st Host Address	Last Host Address	Broadcast Address
Students	10	500					
Management	15	200					
Teaching Staff	20	100					
HR	25	60					
Marketing	30	30					
IT Management	35	14					
DNS	N/A	6					
Campus1 to MCAMPUS	N/A	2					
Campus2 to MCAMPUS	N/A	2					
Wireless	40	500		**11.11.6.0**			