

# **World Skills Competition**

## **Trade 39: IT PC and Network Support**

**Day 4**

Pre-requisites: Nil

**Action Required:**

- Setup a LAN using a switch and router
- Install and configure switch and router
- Configure access control lists on router
- Format and partition hard disk of computers provided
- Install and configure server operating system
- Setup Web Server and FTP server
- Install and configure DNS Server
- Configure WINS Server
- Configure DHCP Server
- Create user accounts, groups and configure user profiles
- Assign shared folders and NTFS permissions
- Manufacture of various types of cable
- Router IOS upgrade

**SPECIAL INSTRUCTIONS:**

1. Today's tasks are divided into **TWO** parts. You are to try to complete them by the end of the day.
2. You will be given Part 2 **after** lunch.

In part 1, you have **1 hour** to complete section A. However if you finish early you may continue with the remaining sections for part 1.

If you have not completed the cables by the end of the hour, you will be supplied with working cables and marks for uncompleted cables will be forfeited.

## Problem Description

Your company would like to use VLANs (Virtual Local Area Networks) to segregate the collision domains of network users in different departments. You have been given the following equipment:

Equipment	Brief Hardware Configuration	Quantity
Cisco Router	Cisco 2514 router with at least 8Mb flash and 4 Mb RAM	1
Ethernet AUI Transceiver for Cisco router	CentreCom 210T Twisted Pair Transceiver	2
Cisco Switch	Cisco Catalyst Switch 1900XL Enterprise series	1
Workstation	<ul style="list-style-type: none"><li>• Pentium III 866(or over)</li><li>• 128MB-RAM</li><li>• CD-ROM (40X or better)</li><li>• Digital Headset</li><li>• 17" Monitor</li><li>• 106Keyboard</li><li>• P/S2 mouse</li><li>• 3.5"FDD, 20GB(or over) HDD</li><li>• 10/100Mbps LAN card</li></ul>	2
UTP cables	Category 5	7 x 3.5 metres
RJ45 plugs	-	15 pieces
RJ45 crimping tool	-	1
Cable Tester	-	1
Blank 3¼ inch diskette	-	2

You are to set up the network according to specifications given in Figure F1 and install the required software into the respective workstations.

The following are the software provided for your installation:

<b>Software</b>	<b>Brief Description</b>	<b>Quantity</b>
Microsoft Windows 2000 Professional	English version	1 set
Microsoft Windows 2000 Server	English version	1 set
Microsoft Windows 98Start Up disk	3.5", high density, preformatted	1 set
Drivers for CD ROM		1 set
Drivers for SVGA card		1 set
Drivers for Network card		1 set
Drivers for Sound card		1 set
Diskette containing the Marketing.html and HR.html files		1 set
Cisco IOS version 12.0.5 (T)	IOS for Cisco router upgrade	1 set

## Detail Configuration Specifications

### Part I Instructions

You have 3 hours to complete the 4 sections A, B, C and D.

You have 1 hour to complete section A, however if you finish early you may continue with the remaining sections.

Do not start operating system installation until cables are manufactured and checked by 2 Judges

#### A. Network cables

Note: You will be given 15 x RJ45 connectors from which you must make 7 cables. You will not be given any extra RJ45 connectors.

1. Manufacture 4 straight through network cables. The network cables should measure 3 metres (+/- 2 centimeters) from the ends of the RJ45 plugs. You may use the floor markings provided to measure this.
2. For testing purposes, manufacture 2 cross-over cables. The network cables should measure 3 metres (+/- 2 centimeters) from the ends of the RJ45 plugs.
3. Manufacture your own roll-over cable to use to configure the Cisco router and switch. The roll-over cables should measure 3 metres (+/- 2 centimeters) from the ends of the RJ45 plugs.

**STOP**

**You must get 2 Judges to sign here before you continue**

<b>Judge 1</b>	<b>Judge 2</b>
<b>Name:</b>	<b>Name:</b>
<b>Signature</b>	<b>Signature</b>

## **B. Network**

To help save time you may start any operating system installations from this point onwards.

1. Configure Cisco Switch with ports 1 to 6 to be VLAN 1 and ports 7 to 12 to be VLAN 2.
2. Your company has been assigned the network IP address 152.226.0.0 by an Internet Service Provider.

You are required to subnet to allow at least 20 subnets. Maximise the number of hosts per subnet.

Assign subnet #1 to VLAN 1

Assign subnet #2 to VLAN 2

Do not use subnet #0. (For example, 152.226.0.1 would be a host in subnet #0)

3. Backup existing Cisco router IOS to C:\IOS on PC1
4. Upgrade the Cisco router IOS to version IOS 12.0.5(T) using the CD provided.
5. The Cisco router enable password must be set to 2001.
6. The Cisco router vty line passwords must be set to 2001.
7. Attached Cisco router interface E0 to VLAN 1 and Cisco router interface E1 to VLAN 2. Assign suitable valid IP addresses to these interfaces.
8. Use IGRP routing protocol with Autonomous System Number 69.

## **C. PC1**

1. Configure to specification giving in Table T1.
2. Install DHCP server to provide suitable valid IP addresses to users in VLAN1 and VLAN2.
3. Every Windows-based computer on your network must be able to access the Windows 2000 server computer by computer name. Install a WINS server and configure the DHCP server for WINS. The DHCP server is to automatically assign the IP address of the WINS server and the NetBIOS node types to all DHCP client computers. You should also create an option that automatically assigns the default gateway address to your DHCP clients.
4. Create 2 groups of users (see Tables T2 and T3) who can access permitted resources in the WSC domain. User account lockout is to be set after 3 unsuccessful attempts and only the administrator should unlock the accounts. Users should also be required to change their passwords for the first logon and once every 90 days.

5. Each user requires a secured home folder. All home folders need to be backed up each night by the administrator. Drive Z: will be used to connect to the user's home folder whenever the user logon to the network. The users' home folders are to be stored in a subfolder under C:\users.
6. Each user who logon to the WSC domain from multiple computers should get his/her own user's profile which is stored centrally in the C:\Profiles folder on the same volume as the users' home folders.
7. The marketing users will only be allowed access to the network from VLAN1. HR users will only be allowed access to the network from VLAN2. Allow the managers of each department to have READ access to their respective departments executive folder.
8. Create a folder named MARKET in the C:\ directory. Create a folder named HR in the C:\ directory. Allow the HR group of users to READ access to the contents of MARKET folder. Allow the MARKET group of users NO ACCESS to the contents of HR folder.
9. From the diskette provided, copy the Marketing.html file into the C:\MARKET folder and copy the HR.html file into the C:\HR folder.
10. Configure the Web Server such that all users will be prompted to enter a valid account and password before they are allowed access to the HTML web page. Use basic authentication.
11. Install a DNS server and configure the server such that
  - To access the Marketing.html file, users would use the addresses **http://market/main**
  - To access the HR.html file, users would use the addresses **http://HR/main**
12. Allow the DNS server to return a host name when queried with an IP address from the client. Configure your DNS server to use WINS to resolve any host names it cannot resolve.

#### **D. PC2.**

1. Configure to specification giving in Table T1.
2. Acquire IP address from DHCP server in VLAN 1.

## Part 2

You have 2 ½ hours to complete the remaining section.

### E. Cisco Router

Configure the Cisco router to

- Prevent users in Subnet #1 from being able to telnet to any workstation in Subnet #2 except to those stations whose IP address end with an even number. Allow access for all other protocols.
- Allow all users to browse web pages found in Subnet #1 and Subnet #2
- Allow only Subnet #1 users to telnet to the router and configure it.
- Set router so it can be configured via a web browser from both Subnets.

### F. Cisco Switch

- Configure the Cisco switch so it can be configured via a web browser from Subnet #2

### G. PC3

1. Connect PC3 to PC1 using the extra NIC provided. Configure PC3 to be a host in subnet #3.
2. PC3 is to obtain IP address from DHCP server. Make any necessary changes to the Cisco router. When you have finished, PC3 is to be able to ping to PC2.

**Do not use static routes to achieve this.**



<b>Workstation</b>	<b>Option</b>	<b>Remarks</b>
<b>PC1</b>	Machine	IBM
	Partition size	100% available space
	Operating system	MS Windows 2000 Server
	File system	NTFS
	Installation directory	Default Directory
	Paging file size	Set to the recommended value
	Per server licensing mode	5 concurrent connections
	Administrator logon ID	ADMIN1
	Administrator logon password	2001
	Primary Domain Controller	Yes
	Domain name	WSC
	Full DNS name	WSC.KR
<b>PC2</b>	Machine	Samsung
	Partition size	100% available space
	Operating system	MS Windows 2000 Professional
	File system	NTFS
	Installation directory	C:\ClientOS
	Paging file size	Set to the recommended value
	Administrator logon ID	ADMIN2
	Administrator logon password	2001
	Domain name	WSC
<b>PC3</b>	Machine	Samsung
	Pre set up with Windows 2000 Pro	100% available space

Table T1

## User List

### Department: HR

	User Name	Full Name	Position
1.	tan	TAN TZE HAU	Manager
2.	zheng	ZHENG KAIWEN	Executive
3.	kwoh	KWOH YAP YONG JUSTIN	Executive

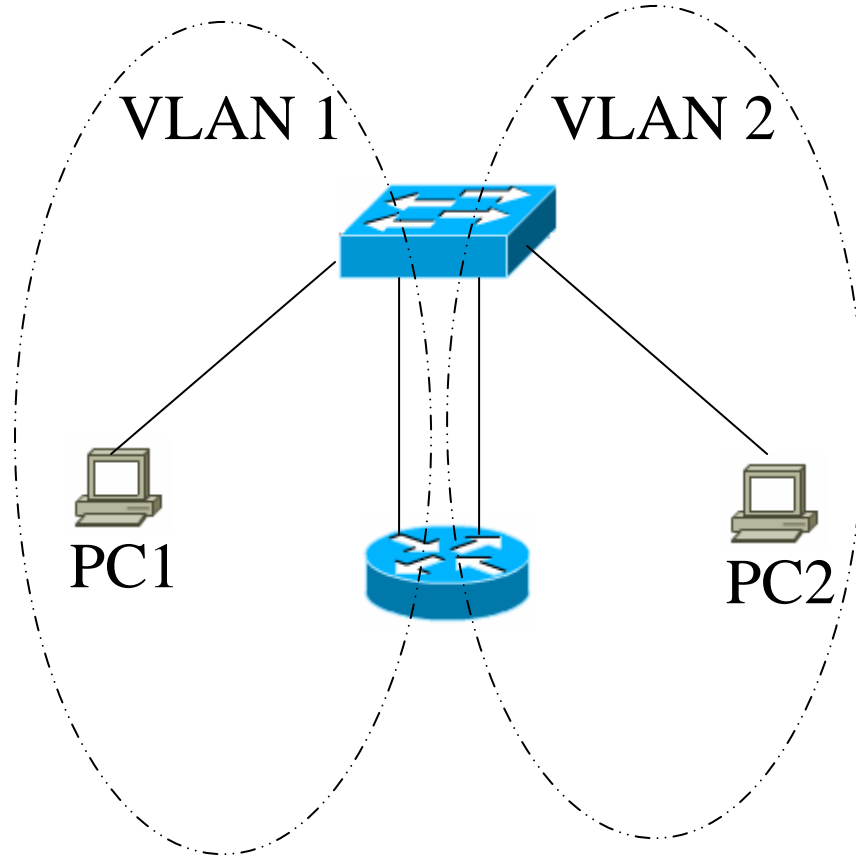
Table T2

### Department: Marketing

	User Name	Full Name	Position
1.	ong	ONG YI-WEN	Manager
2.	lee	LEE KUAN SHIN	Executive
3.	won	WON JIA WANG TONY	Executive
4.	toh	TOH YONG HOE	Executive

Table T3

**152.226.0.0**



Legend



Switch



Router

Domain: WSC

**Figure F1**