

## Networking Infrastructure

Diploma in CSF / IT  
Year 2 (2020/21) Semester 3

Week 5

Session **2**

### Static Routing - CA1 Part1 (Group 10%) – Tutor's Guide

Tutorial Group: P02

Team Number: 1

Grade:

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### Objective

To set up a network comprising 2 routers & 2 switches and to configure the routing table entries in each of the routers.

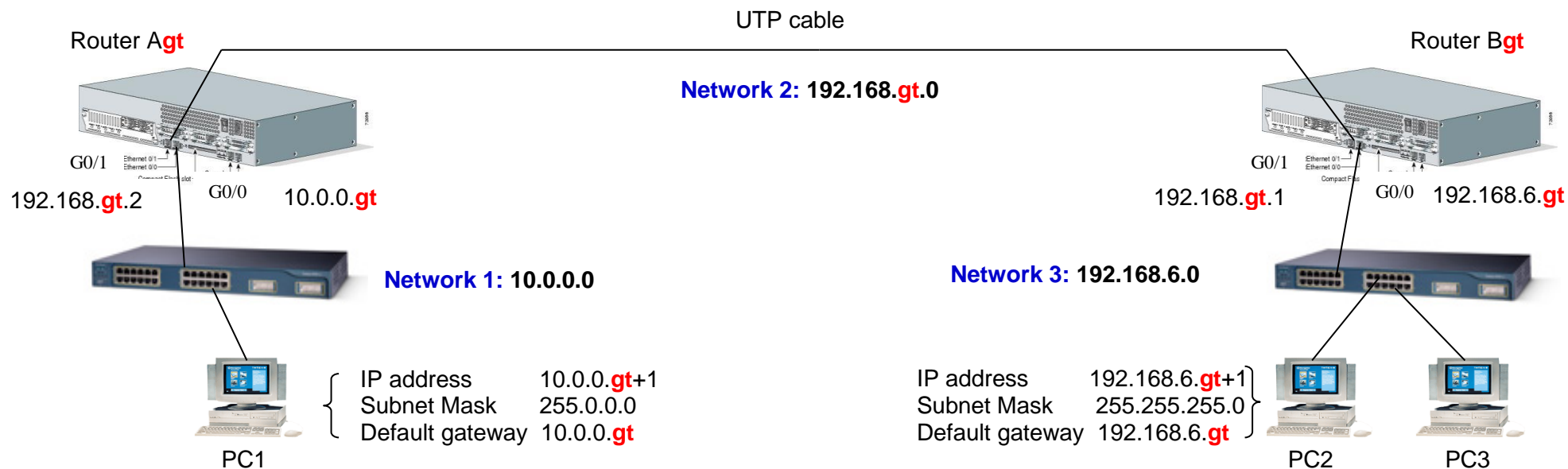
### Instructions

- Form teams of 3-4 members
- Duration: **1 hour**
- Total marks = **20 marks**

### Resources

- 3 Desktop PCs
- 2 Cisco 2901 routers
- 2 Cisco 3560 switches
- 6 UTP cables
- 1 Console cable

**Activity 1: Set up the network as shown in the diagram below (using Packet Tracer)**



**(Note: Replace “gt” with your Tutorial Group and Team number, e.g. Group P02, Team 6: 10.0.0.gt --> 10.0.0.26)**

**Activity 2: Configuring the routers and observing the routing table of each router (using Packet Tracer)**

1. Configured the two routers with the required static routes (note: use next hop IP address)
2. For each router, enter the command “show ip route” to show the routing table and fill in the table below:

Router A - Routing Table (3 marks)	Router B - Routing Table (3 marks)
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks C 10.0.0.0/8 is directly connected, GigabitEthernet0/0 L 10.0.0.21/32 is directly connected, GigabitEthernet0/0 S 192.168.6.0/24 [1/0] via 192.168.21.1 192.168.21.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.21.0/24 is directly connected, GigabitEthernet0/1 L 192.168.21.2/32 is directly connected, GigabitEthernet0/1	S 10.0.0.0/8 [1/0] via 192.168.21.2 192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.6.0/24 is directly connected, GigabitEthernet0/0 L 192.168.6.21/32 is directly connected, GigabitEthernet0/0 192.168.21.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.21.0/24 is directly connected, GigabitEthernet0/1 L 192.168.21.1/32 is directly connected, GigabitEthernet0/1

A “C” before a route stands for a directly connected route via one of the interfaces.

3. Fill in the blanks:
  - A “S” before a route stands for **Static route. (1 mark)**
  - The number of subnets shown in each of the routing table is **3. (1 mark)**

### **Activity 3. Testing of connectivity across the network (using Packet Tracer)**

1. Test whether packets from PC1 can be routed across the routers to PC2 and vice versa. Fill in the table below with the results:

Tracert from PC1 to PC2 (2 marks)	Tracert from PC2 to PC1 (2 marks)
C:\>tracert 192.168.6.22  Tracing route to 192.168.6.22 over a maximum of 30 hops:  1 11 ms 1 ms 0 ms 10.0.0.21 2 * 0 ms 1 ms 192.168.21.1 3 * 4 ms 10 ms 192.168.6.22  Trace complete.	C:\>tracert 10.0.0.22  Tracing route to 10.0.0.22 over a maximum of 30 hops:  1 1 ms 1 ms 0 ms 192.168.6.21 2 0 ms 0 ms 0 ms 192.168.21.2 3 18 ms 11 ms 0 ms 10.0.0.22  Trace complete.

2. Assume that PC3 is configured with an IP address of 192.168.6.**gt**+2 and subnet mask of 255.255.255.0; the default gateway field is left empty. State whether the following ping would be successful:

Using Ping command: (3 marks)	Successful / Fail	Reasons
Ping PC2	<b>Successful</b>	<b>PC2 and PC3 are within the same subnet.</b>
Ping the G0/0 interface of Router B	<b>Successful</b>	<b>Interfaces G0/0 and PC3 are both connected within the same subnet.</b>
Ping the G0/1 interface of Router B	<b>Fail</b>	<b>The request would timeout as the IP address is outside of the network that PC3 is connected to. Without a default gateway, PC3 would not know where to route the data packet.</b>

**Note: The Packet Tracer .pkt file (Static Routing) has to be submitted to MeL together with this CA1 Part1 document (in PDF file format)**

### **Activity 4. Reconfiguring the routers for Dynamic Routing (Note: No need to perform on Packet Tracer)**

1. List the Cisco IOS commands needed to:
- remove the static routes on both routers
  - configure dynamic routing using RIP version 2 on both routers

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Router A <b>(2.5 marks)</b>	Router B <b>(2.5 marks)</b>
RouterA21(config)no ip route 192.168.6.0 255.255.255.0 RouterA21(config)#router rip RouterA21(config-router)#version 2 RouterA21(config-router)#network 10.0.0.0 RouterA21(config-router)#network 192.168.21.0	RouterB21(config)#no ip route 10.0.0.0 255.0.0.0 RouterB21(config)#router rip RouterB21(config-router)#version 2 RouterB21(config-router)#network 192.168.6.0 RouterB21(config-router)#network 192.168.21.0