Canterbury Institute of Management (CIM)
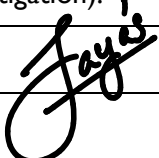## ASSESSMENT COVER SHEET

1. Personal Details

Student ID	Given Name(s)	Surname	Email Address
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Campus	Darwin Campus
Course Title and Code	MBIS404 Networks and Communications
Assessment Title	Assesment Task - *Week 9*
Due Date & Time	01/12/2024

Course Lecturer/Tutor Name:	Assessment Word Count (if applicable):
Sharad Neupane	848

2. Student Declaration

By signing and submitting this coversheet, I/we declare that:

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✓ No part of this assessment has been submitted previously for advanced standing or academic credit in this or any other course.

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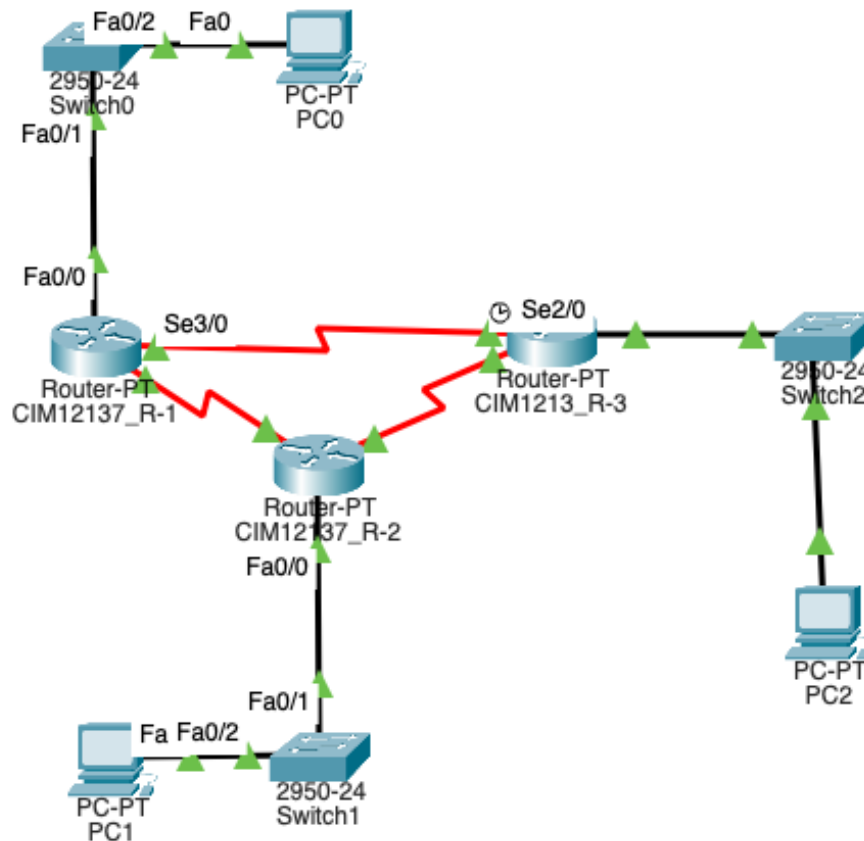| Signature:		Date:	26/11/24

Network Overview

Figure 1: Network Overview

Bill of Materials

1. Routers - 3 X PT Routers

2. Switches - 3 X 1950-24 Switches

3. Hosts - 3 X Regular compatible personal computer hosts

4. Cables - 6 X Straight through cables and 3 X serial DTE cables

Note: Password is set to: *cim12137*

Setting Up Network

Following general steps were followed to create & test the network.

- Assign Static IPs to Hosts

- Configure Switches

- Configure Routers & Routing Protocol

- Test connectivity between hosts

Assigning Static IPs to Hosts

The three hosts were assigned IP addresses as follows.

1. PC0 - 192.168.0.05/24

2. PC1 - 192.168.10.10/24

3. PC2 - 192.168.20.20/24

Configure Switches

1. Create a VLAN

2. Assign port range to VLAN

Configuring - *Switch 1*

```
1    enable
2    conf t
3    hostname CIM12137-SW-1
4    vlan 10
5    name VLAN10
6    exit
7
8    interface range fastethernet0/1-24
9    switchport mode access
10   switchport access vlan 10
11   exit
12
13   interface vlan 10
14   no shutdown
15   exit
16
```

Listing 1: Configuring Switches Example

Configuring - *Switch 2*

```
1        enable
2        conf t
3        hostname CIM12137-SW-2
4        vlan 20
5        name VLAN20
6        exit
7
8        interface range fastethernet0/1-24
9        switchport mode access
10       switchport access vlan 20
11       exit
12
13       interface vlan 20
14       no shutdown
15       exit
16
```

Listing 2: Configuring Switches Example

Configuring - *Switch 3*

```
1        enable
2        conf t
3        hostname CIM12137-SW-3
4        vlan 30
5        name VLAN30
6        exit
7
8        interface range fastethernet0/1-24
9        switchport mode access
10       switchport access vlan 30
11       exit
12
13       interface vlan 30
14       no shutdown
15       exit
16
```

Listing 3: Configuring Switches Example

Configuring - Routers

Routers are configured in two steps,

1. Port IP configuration

2. OSPF Configuration

Configuring - *Router 1 - Ports*

Following interfaces are assigned with IP addresses given below.

1. Fa0/0 - 192.168.0.1/24

2. Se3/0 - 20.10.10.1/30

3. Se2/0 - 20.10.20.1/30

```
1   enable
2   conf t
3   hostname CIM12137_R-1
4
5   interface fastethernet0/0
6   ip address 192.168.0.1 255.255.255.0
7   no shutdown
8   exit
9   interface se3/0
10  ip address 20.10.10.1 255.255.255.252
11  no shutdown
12  exit
13  interface se2/0
14  ip address 20.10.20.1 255.255.255.252
15  no shutdown
16  exit
17
```

Listing 4: Port Configuration on Router 1

Configuring - *Router 2 - Ports*

Following interfaces are assigned with IP addresses given below.

1. Fa0/0 - 192.168.10.1/24

2. Se3/0 - 20.10.30.1/30

3. Se2/0 - 20.10.20.2/30

```
1    enable
2    conf t
3    hostname CIM12137_R-2
4
5    interface fastethernet0/0
6    ip address 192.168.10.1 255.255.255.0
7    no shutdown
8    exit
9    interface se3/0
10   ip address 20.10.30.1 255.255.255.252
11   no shutdown
12   exit
13   interface se2/0
14   ip address 20.10.20.2 255.255.255.252
15   no shutdown
16   exit
17
```

Listing 5: Port Configuration on Router 2

Configuring - *Router 3 - Ports*

Following interfaces are assigned with IP addresses given below.

1. Fa0/0 - 192.168.20.1/24

2. Se3/0 - 20.10.30.2/30

3. Se2/0 - 20.10.10.2/30

```
1    enable
2    conf t
3    hostname CIM12137_R-3
4
5    interface fastethernet0/0
6    ip address 192.168.20.1 255.255.255.0
7    no shutdown
8    exit
9    interface se3/0
10   ip address 20.10.30.2 255.255.255.252
11   no shutdown
12   exit
13   interface se2/0
14   ip address 20.10.10.2 255.255.255.252
15   no shutdown
16   exit
17
```

Listing 6: Port Configuration on Router 3

Configuring OSPF

OSPF configuration enables routers detect paths between available networks.

Configuring - *Router 1 - OSPF*

```
1        enable
2        conf t
3        router ospf 1
4        network 192.168.0.0 0.0.0.255 area 0
5        network 20.10.20.0 0.0.0.3 area 0
6        network 20.10.10.0 0.0.0.3 area 0
7
```

Listing 7: Router 1 OSPF Configuration

Configuring - *Router 2 - OSPF*

```
1        enable
2        conf t
3        router ospf 1
4        network 192.168.0.0 0.0.0.255 area 0
5        network 20.10.20.0 0.0.0.3 area 0
6        network 20.10.10.0 0.0.0.3 area 0
7
```

Listing 8: Router 2 OSPF Configuration

Configuring - *Router 3 - OSPF*

```
1        enable
2        conf t
3        router ospf 1
4        network 192.168.20.0 0.0.0.255 area 0
5        network 20.10.10.0 0.0.0.3 area 0
6        network 20.10.30.0 0.0.0.3 area 0
7
```

Listing 9: Router 3 OSPF Configuration

Validating Configuration

OSPF Route Discovery


```
CIM12137_R-1#show ip route ospf
     20.0.0.0/30 is subnetted, 3 subnets
O        20.10.30.0 [110/128] via 20.10.20.2, 03:00:33, Serial2/0
                    [110/128] via 20.10.10.2, 03:00:33, Serial3/0
O     192.168.10.0 [110/65] via 20.10.20.2, 03:00:33, Serial2/0
O     192.168.20.0 [110/65] via 20.10.10.2, 03:00:33, Serial3/0
```

Figure 2: Discovered OSPF Routes at Router 1


```
CIM12137_R-2#show ip route ospf
     20.0.0.0/30 is subnetted, 3 subnets
O        20.10.10.0 [110/128] via 20.10.20.1, 03:01:03, Serial2/0
                    [110/128] via 20.10.30.2, 03:01:03, Serial3/0
O     192.168.0.0 [110/65] via 20.10.20.1, 03:01:03, Serial2/0
O     192.168.20.0 [110/65] via 20.10.30.2, 03:01:03, Serial3/0
```

Figure 3: Discovered OSPF Routes at Router 2


```
CIM12137_R-3#show ip route ospf
     20.0.0.0/30 is subnetted, 3 subnets
O        20.10.20.0 [110/128] via 20.10.10.1, 03:00:59, Serial2/0
                    [110/128] via 20.10.30.1, 03:00:59, Serial3/0
O     192.168.0.0 [110/65] via 20.10.10.1, 03:00:59, Serial2/0
O     192.168.10.0 [110/65] via 20.10.30.1, 03:00:59, Serial3/0
```

Figure 4: Discovered OSPF Routes at Router 3

Connectivity Simulation Results

Connectivity between hosts can be simulated using ICMP packets on Packet Tracer.

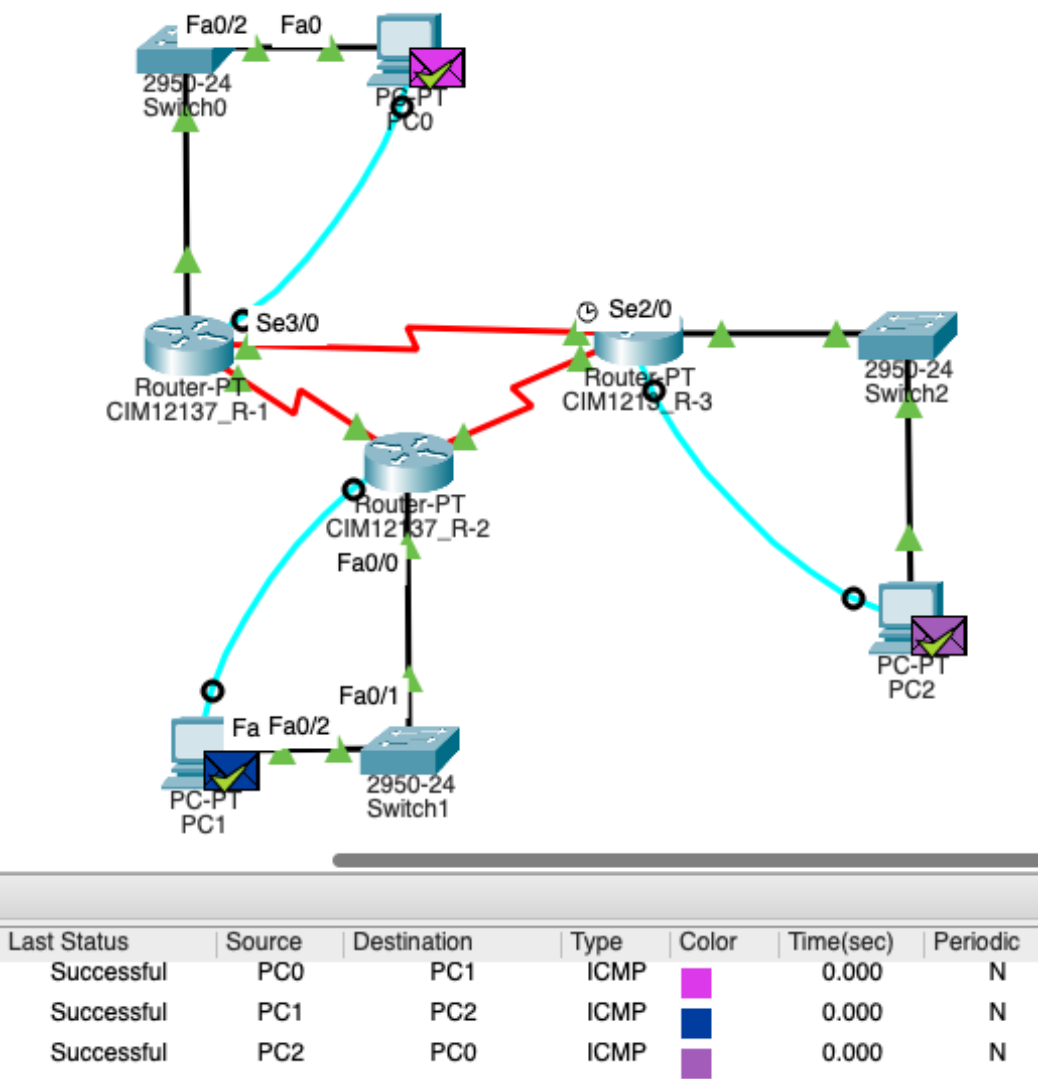| Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
Successful	PC0	PC1	ICMP		0.000	N
Successful	PC1	PC2	ICMP		0.000	N
Successful	PC2	PC0	ICMP		0.000	N

Figure 5: ICMP Results Summary