LAB 1: THE HOMEWORK FILE #1

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Objectives

To record and do the class activity. In this case is for Class Activity #1

Scenario

After the exercise in class (Class Activity #1), you should have a basic idea of connections and packet forwarding within a network topology.

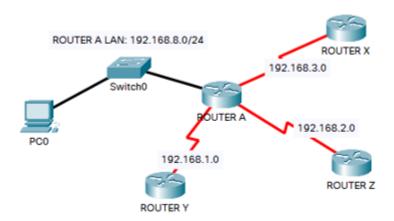
Previously, in class, you and your partner had created a topology, with the 5 routers. Now copy that topology into Packet Tracer. This will now be the basis of your exercises. Just remember to name them accordingly. For this particular activity, name the PT file as YOURNAME_ACT1 (of YOURNAME means your own name). This is individual work.

As you do the activity, and have your answers, compare them with your partner. Then compare your answers with, at least, one other group from the class.

Tasks

Task 1 - Create in Packet Tracer and record your topology

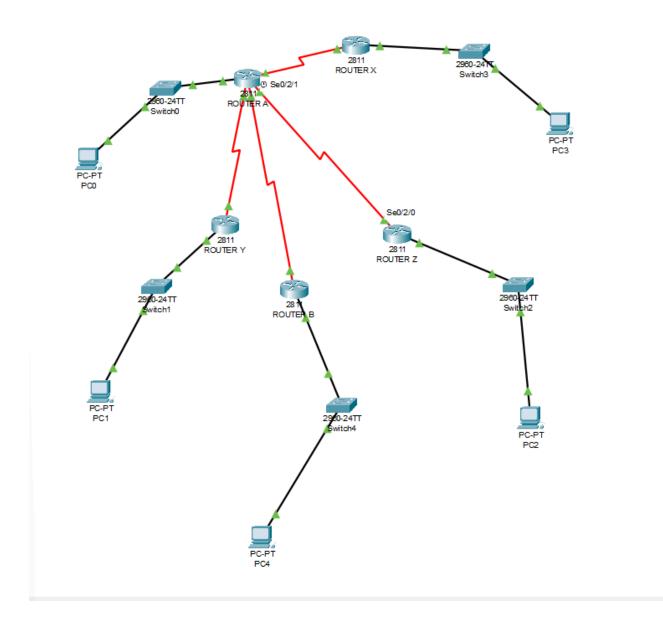
- Create your topology in Packet Tracer.
- Make sure that every router has ONE LAN, with a switch and 1 PC. *Note: You can assign any network address to the LAN – as long as it does not conflict with other network address in the topology).
- A sample is shown below.



- Make sure all the IP addresses ,cables and interfaces done.
- Copy the topology from your Packet Tracer here.

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Task 2 – Record your topology's information in an addressing table.

- You have seen an example of addressing table in previous labs. For LAN, use the same address group (example for Router A LAN − use 192.168.x.0/24 , where x is 1 − 9 and does not overlap with the other addresses).
- Create one for your topology in Task 1.Display your Addressing table here. Be sure to be specific (as previous examples show).

Device	Interface	IP Address	Subnet Mask	Gateway	Status
ROUTER A	Serial0/2/0	192.168.1.1	255.255.255.0	-	UP
	FastEthernet0/ 0	192.168.8.1	255.255.255.0	-	UP
	Serial0/2/1	192.168.2.1	255.255.255.0	-	UP
	Serial0/0/0	192.168.3.1	255.255.255.0	-	UP
	Serial0/0/1	192.168.4.1	255.255.255.0		
ROUTER Y	Serial0/2/1	192.168.1.2	255.255.255.0	-	UP
	FastEthernet0/ 0	192.168.10.1	255.255.255.0	-	UP
ROUTER X	Serial0/2/0	192.168.3.2	255.255.255.0	-	UP
	FastEthernet0/ 0	192.168.30.1	255.255.255.0	-	UP
ROUTER Z	Serial 0/2/0	192.168.2.2	255.255.255.0	-	UP
	FastEthernet0/ 0	192.168.20.1	255.255.255.0	-	UP
ROUTER B	Serial0/2/0	192.168.4.2	255.255.255.0	-	UP
	FastEthernet0/ 0	192.168.40.1	255.255.255.0	-	UP
PC0	FastEthernet0	192.168.8.10	255.255.255.0	192.168.8.1	
PC1	FastEthernet0	192.168.10.2	255.255.255.0	192.168.10.1	
PC2	FastEthernet0	192.168.20.2	255.255.255.0	192.168.20.1	
PC3	FastEthernet0	192.168.30.2	255.255.255.0	192.168.30.1	
PC4	FastEthernet0	192.168.40.2	255.255.255.0	192.168.40.1	

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Task 2 – Record the routing table of all routers.

- In the privilege Exec mode type show ip route to display the routing table for the router.
- Paste the routing table for each router here.
- Look through these routing table for information (to answer Reflection questions).

ROUTER A:

```
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route
Gateway of last resort is not set
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.1.0/24 is directly connected, Serial0/2/0
L
       192.168.1.1/32 is directly connected, Serial0/2/0
    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.2.0/24 is directly connected, Serial0/2/1
L
       192.168.2.1/32 is directly connected, Serial0/2/1
    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
       192.168.3.0/24 is directly connected, Serial0/0/0
L
       192.168.3.1/32 is directly connected, Serial0/0/0
    192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.8.0/24 is directly connected, FastEthernet0/0
       192.168.8.1/32 is directly connected, FastEthernet0/0
```

ROUTER Y:

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```
Router>ENABLE
Router#SHOW IP ROUTE
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
     192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
        192.168.1.0/24 is directly connected, Serial0/2/1
        192.168.1.2/32 is directly connected, Serial0/2/1
    192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C
        192.168.10.0/24 is directly connected, FastEthernet0/0
        192.168.10.1/32 is directly connected, FastEthernet0/0
Router#
```

ROUTER Z:

```
Router>ENABLE
Router#SHOW IP ROUTE
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
     192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.2.0/24 is directly connected, Serial0/2/0
L
       192.168.2.2/32 is directly connected, Serial0/2/0
     192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.20.0/24 is directly connected, FastEthernet0/0
L
       192.168.20.1/32 is directly connected, FastEthernet0/0
Router#
```

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ROUTER X:

```
Router>ENABLE
Router#SHOW IP ROUTE
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C
       192.168.3.0/24 is directly connected, Serial0/2/0
L
       192.168.3.2/32 is directly connected, Serial0/2/0
    192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
       192.168.30.0/24 is directly connected, FastEthernet0/0
       192.168.30.1/32 is directly connected, FastEthernet0/0
```

Router#

ROUTER B:

```
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
Gateway of last resort is not set
    192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.4.0/24 is directly connected, Serial0/2/0
L
       192.168.4.2/32 is directly connected, Serial0/2/0
    192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
С
       192.168.40.0/24 is directly connected, FastEthernet0/0
       192.168.40.1/32 is directly connected, FastEthernet0/0
L
Router#
```

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Task 3 – Testing the connection.

• From a PC in LAN of router A (let's call it PCA of LAN_A), try pinging all the other PCs in te other LANs. What is the outcome?

Table 1

From	То	Ping result
PCA	PCB	Pinging 192.168.10.2 with 32 bytes of data: Reply from 192.168.0.1: Destination host unreachable. Request timed out. Reply from 192.168.0.1: Destination host unreachable. Reply from 192.168.0.1: Destination host unreachable. Ping statistics for 192.168.10.2: Packets: Sent = 4, Received = 0, Lost = 4 (100% 10ss), Ci\> Reply fromDestination host unreachable
PCA	PCX	Pinging 192.168.20.2 with 32 bytes of data: Reply from 192.168.8.1: Destination host unreachable. Ping statistics of 192.168.20.2: Packets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\> Reply fromDestination host unreachable
PCA	PCY	Pinging 192.168.30.2 with 32 bytes of data: Reply from 192.168.8.1: Destination host unreachable. Reply from 192.168.6.1: Destination host unreachable. Reply from 192.168.6.1: Destination host unreachable. Reply from 192.168.6.1: Destination host unreachable. Ping statistics for 192.168.30.2: Reckets: Sent = 4, Received = 0, Lost = 4 (1004 loss), C1/M Reply fromDestination host unreachable
PCA	PCZ	Reply from 192.168.80.1: Destination host unreachable. Request timed out. Reply from 192.168.80.1: Destination host unreachable. Reply from 192.168.80.1: Destination host unreachable. Reply from 192.168.80.1: Destination host unreachable. Reply from 192.168.80.16 40.2: Fackets: Sent = 4, Received = 0, Lost = 4 (100% loss), Cil> Reply fromDestination host unreachable

From	То	Ping result
PCB	PCA	ringing 192.168.8.10 with 32 bytes of data: Reply from 192.168.40.11 Destination host unreachable. Reply from 192.168.40.11 Destination host unreachable. Reply from 192.168.40.11 Destination host unreachable. Request timed out. Pind statistics for 192.168.6.10: Packets: Sent = 4, Received = 0, Lost = 4 (100% loss), CANS Reply fromDestination host unreachable
PCB	PCX	Pinging 192.166.10.2 with 32 bytes of data: Reply from 192.168.40.1: Destination host unreachable. Ping statistics for 192.168.0.2: Recets: Sent = 4, Received = 0, Lost = 4 (1004 loss), CIVI Reply fromDestination host unreachable

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PCB	PCY	Reply from 192.168.20.2 with 32 bytes of data: Reply from 192.168.40.1: Destination host unreachable. Reply from 192.168.40.1: Destination host unreachable. Reply from 192.168.40.1: Destination host unreachable. Request timed out. Fing statistics for 192.168.20.2: Reckets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\> Reply fromDestination host unreachable
РСВ	PCZ	Finging 192.168.30.2 with 32 bytes of data: Reply from 192.168.40.1: Destination host unreachable. Fing statistics for 192.168.30.2: Factorial for 192.168.30.2: Reply fromDestination host unreachable

From	То	Ping result
PCX	PCA	Pinging 192.168.8.10 with 32 bytes of data:
PCX	PCB	Finging 192.163.40.2 with 32 bytes of data: Reply from 192.163.30.1: Destination host unreachable. Reply from 192.163.30.1: Pertination bost unreachable. Reply from 192.163.30.1: Pertination bost unreachable. Reply from 192.163.30.1: Pertination host unreachable. Reply from 192.163.30.1: Pertination host unreachable. Packets: Sent - 4, Received - 0, Lost - 4 (100% loss), C:\> Reply fromDestination host unreachable
PCX	PCY	C:\ping 192.168.10.2 Pinging 192.168.10.2 with 32 bytes of data: Reply from 192.168.30.1: Destination host unreachable. Ping statistics for 192.168.10.2: Fackets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\pi
PCX	PCZ	C1\ping 192.166.20.2 Finging 192.166.20.2 Finging 192.168.30.11 Destination host unreachable. Reply from 192.168.30.11 Destination host unreachable. Reply from 192.168.30.11 Destination host unreachable. Fing statistics for 192.168.20.21 Factors: Sent = 4, Received = 0, Lost = 4 (100% loss), C1\> Reply fromDestination host unreachable

From	То	Ping result
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PCY	PCA	Finging 192.168.8.10 with 32 bytes of data: Reply from 192.168.8.10 with 32 bytes of data: Reply from 192.168.10.1: Destination host unreachable. Reply from 192.168.8.10: Rackets: Sent = 4, Received = 0, Lost = 4 (100% loss), CIVAL Reply fromDestination host unreachable
PCY	PCB	C:\oping 92.168.40.2 with 32 bytes of data: Reply from 192.168.40.1 bestination host unreachable. Reply from 192.168.10.1: Bestination host unreachable. Fing statistics for 92.168.40.2: Reckets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\oping 192.168.40.2: C:\oping 192.168.40.2: Reply fromDestination host unreachable.
PCY	PCX	C:\oping 192.168.20.2 Pinging 192.168.20.2 with 32 bytes of data: Reply from 192.168.10.1: Pestination bost unreachable. Requisert timed out. Reply from 192.168.10.1: Pestination bost unreachable. Reply from 192.168.10.1: Pestination bost unreachable. Ping statistics for 192.168.20.2: Packets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\omega Reply fromDestination host unreachable
PCY	PCZ	Pinging 192.168.30.2 with 32 bytes of data: Reply from 192.168.10.1: Destination host unreachable. Repugest timed out: Reply from 192.168.10.1: Destination host unreachable. Reply from 192.168.10.1: Destination host unreachable. Ping statistics for 192.168.30.2: Rackets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\(\text{C:}\(\text{C:}\)\) Reply fromDestination host unreachable

From	То	Ping result
PCZ	PCA	Plinging 192.168.8.10 with 32 bytes of data: Reply from 192.168.20.11 Destination host unreachable. Pling statistics for 192.168.8.101 Received = 0, Lost = 4 (100% loss), CINS Reply from Destination host unreachable.
PCZ	PCB	C:\ping 192.168.40.2 Finging 192.168.40.2 with 32 bytes of data: Reply from 192.168.20.1: Destination host unreachable. Fing statistics for 192.168.40.2: Received = 4, Received = 0, Lost = 4 (100% loss), C:\> Reply fromDestination host unreachable

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PCZ	PCY	C:\sping 192.168.10.2 with 32 bytes of data: Reply from 192.168.20.1: Destination host unreachable. Pling statistics for 192.168.20.1: Destination host unreachable. Pling statistics for 192.168.10.21. Packets: Sent = 4, Received = 0, Lost = 4 (100% loss), C:\sq\ Reply fromDestination host unreachable
PCZ	PCX	C:\ping 192.168.30.2 Pinging 192.168.30.2 with 32 bytes of data: Reply from 192.168.30.1: Destination host unreachable. Reply from 192.168.20.1: Destination host unreachable. Reply from 192.168.20.1: Destination host unreachable. Reply from 192.168.20.1: Destination host unreachable. Reply from 192.168.30.2: Destination host unreachable. Ping statistics for 192.168.30.2: Rackets: Sent = 4, Received = 0, Lost = 4 (100% loss), CIVI Reply fromDestination host unreachable

 Do the previous step to all the other PCs. Make a table for each PC (like Table 1 above), and paste it here.

Reflection

- 1. What can you say about the content of the routing table of the router?
- 2. What kind of connection does the routers have (as shown in its routing table)?
- 3. In their current situation, can each LAN of each router reach the LAN of the other routers?
- 4. What is needed to enable end-to-end communication between all the PCs within the topology?

Answers:

1. Content of the Routing Table

The routing table of a router contains information about networks it can reach. Typically, it lists directly connected networks and, if configured, static or dynamic routes to remote networks. In this case, the routing table likely includes only directly connected networks, which means the router does not have knowledge of networks beyond its immediate connections unless additional routing has been implemented.

2. Type of Connection in the Routing Table

Based on the routing table, the routers show **directly connected routes**, which are networks that are physically connected to the router's interfaces. If routing protocols such as RIP or OSPF are not configured, then there are no dynamic routes. Likewise, if static routes are not manually added, the router cannot reach networks that are not directly connected.

3. Connectivity Between LANs of Different Routers

In the current configuration, not all LANs connected to different routers can communicate with each other. Without proper routing information shared between routers, communication is limited to within each individual LAN or directly connected networks. Hence, end-to-end connectivity between all LANs is not possible in this situation.

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4. Requirements for End-to-End Communication

To enable full end-to-end communication between all PCs in the topology, routing must be properly configured on all routers. This can be achieved by:

- Adding static routes manually for all remote networks, or
- Configuring a dynamic routing protocol such as RIP or OSPF to allow routers to exchange routing information automatically. Additionally, each PC must be assigned a correct IP address, subnet mask, and default gateway. All router interfaces must also be correctly configured and operational.

Extra information

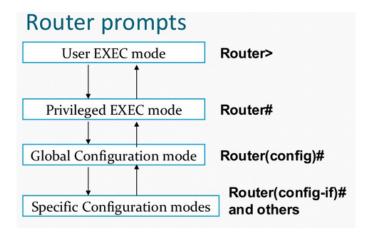


Figure 1: Router prompts

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