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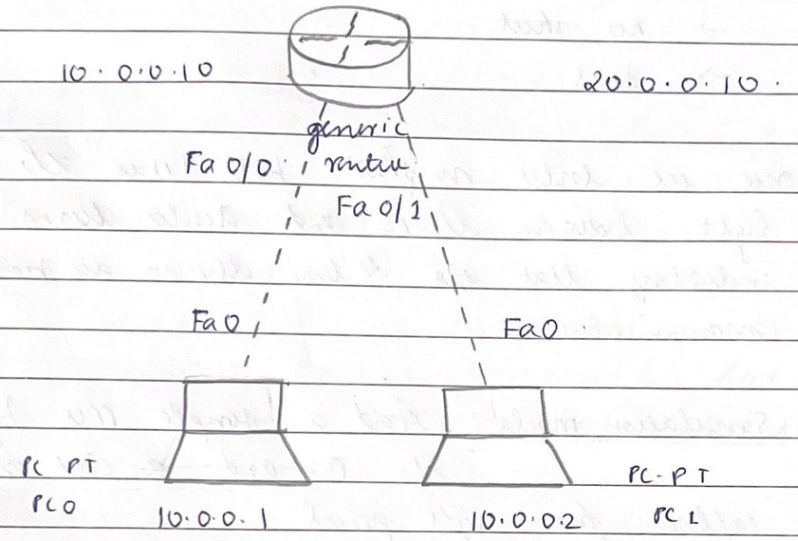
Experiment 2:

14/11/22

Title: Experiment using routers and PCs

Aim: Configuring IP address to routers in Packet Tracer & Explore the following messages: Ping Responses, destination unreachable, Request timed out, Reply.

Topology:



Procedure: ⇒ Place a generic router and two generic PCs in your workspace.

⇒ Connect the router and PCs using copper cross over

⇒ Configure IP address of each PC and

⇒ in the configuration tab under setting set gateway for both PCs to the sole router.

⇒ Click on the generic router and go the CLI tab. enter the following commands to set up a connection between PCs and generic router through gateway 10.0.0.10.

→ No

→ enable

→ config t

→ interface fastethernet 0/0

→ ip address 10.0.0.10 255.0.0.0
→ no shut
→ exit.

now to set up connection between PC and the router through gateway 20.0.0.10

→ interface fastEthernet 1/0
→ ip address 20.0.0.10 255.0.0.0
→ no shut
→ exit.

→ once we enter no shut both times the amber light between the pc and router turns green indicating that the two devices are ready for communication.

Simulation mode - Add a simple PDU by selecting the PCs and click on auto-capture from right panel.

Real time mode - selct the PC you want to send the packet from which is PC0 in our case and open its command prompt from desktop tab. Specify the destination PC by specifying the destination address.
A response is sent from destination PC to source PC

Result -

C:\> Ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data
Request timed out
Reply from 20.0.0.1 : bytes=32 time<1ms TTL=127
Reply from 20.0.0.1 : bytes=32 time<1ms TTL=127

Reply from 20.0.0.1 : bytes = 32 time < 1ms TTL = 127

Ping statistics for 20.0.0.1 :
packets : sent = 4 , recieved = 3 , lost = 1 (25% loss)

C:\> Ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data :

Reply from 20.0.0.1 : bytes = 32 time < 1ms TTL = 127
Reply from 20.0.0.1 : bytes = 32 time < 1ms TTL = 127
Reply from 20.0.0.1 : bytes = 32 time < 1ms TTL = 127
Reply from 20.0.0.1 : bytes = 32 time < 1ms TTL = 127

ping statistics for 20.0.0.1 :
packets : sent = 4 , recieved = 4 , lost = 0
(0% loss) .

Learnings :-

When PC0 pings PC2 for the first time, we get the first packet as request timed out.
Now, if we ping PC2 again from PC0 we get all 4 packets with no packet lost because it has now learnt the network. Now reverse pinging PC0 from PC2 will also not lead to any loss, all packets are acknowledged.

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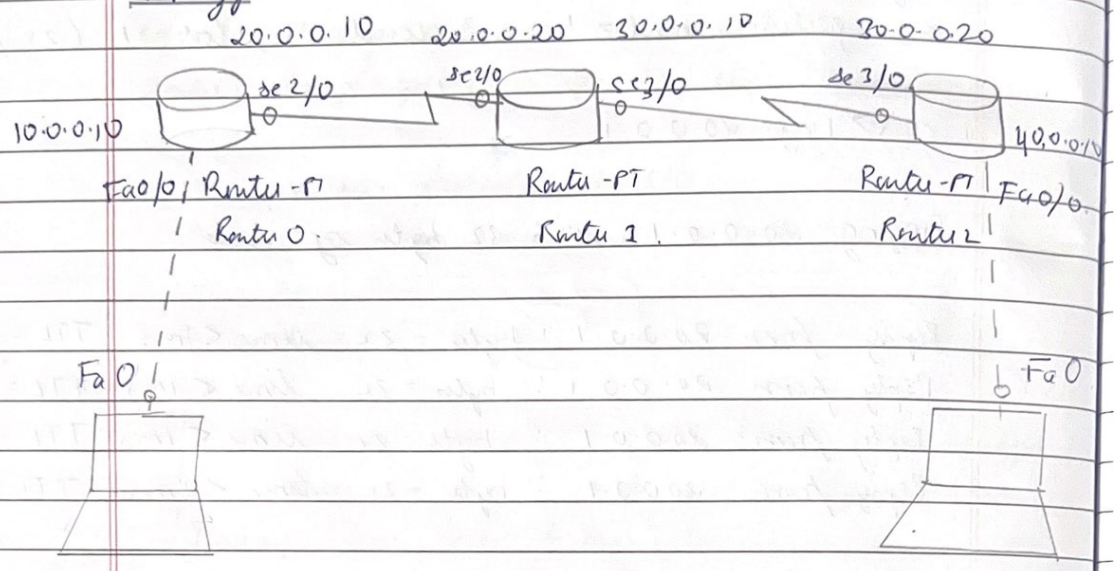
with multiple routers and multiple PCs

Topology:



Procedure: * Place 2 generic routers and 2 generic PC's in the workspace.

* Place a note for each device (PC and router) and specify the IP address.
* Connect the router and PC using copper cross wire.
* Connect the routers using serial DCE
* Click on each PC, go to the configure tab set the IP address and subnet mask in fast ethernet 0.
* Next click on settings in the config tab set the gateway as the IP address of the next router. (eg: 10.0.0.10).
* IP address of PC and its gateway address should belong to the same network.

for connecting two routers -

* Click on Router0 go to CLI, enter the following commands. —
  - → no
  - → enable
  - → config t
  - → interface ... serial 2/0
  - → ip address 20.0.0.10 255.0.0.0.
  - → no shut.

* Click on router 1, open CLI and enter the following commands, -
  - → no
  - → enable
  - → config t
  - → interface ... serial 2/0
  - → ip address 20.0.0.20 255.0.0.0
  - → no shut.

* after doing this the red lights between the two routers will now turn green [router 0 & router 1] indicating that they are now ready for communicati

for connecting two devices [1 pc and one router].

* Since IP addrss of the PC0 is already configured go to router.
* Open CLI for router 0. - enter the following commands -
  - → no
  - → enable
  - → config t
  - → interface fastethernet 0/0
  - → ip address 10.0.0.10 255.0.0.0
  - → no shut.

The red light turns green meaning that the network is ready for communication.

Telling Router 0 of network 30 & 40.
→ no
→ enable
→ config t
→ interface serial 2/0
→ ip route 30.0.0.0 255.0.0.0 20.0.0.20
→ exit
→ show ip route

Telling Router 0 of network 40
→ no
→ enable
→ config t
→ interface serial 2/0
→ ip route 40.0.0.0 255.0.0.0 20.0.0.20
→ exit
→ show ip route

Similarly repeat this for router 1 & router 2.

Simulation mode: Add a simple PDU by selecting the PC2 and click on any one from right panel.

Real time mode: Select the PC PC0 and go to its command prompt and ping the routers.
Once the message has been successfully sent repeat this with router 1 and two as well. Finally ping PC1.

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Result :-

1. PC> Ping 40.0.0.1 .

Pinging 40.0.0.1 with 32 bytes of data :

Reply from 10.0.0.10 : destination host unreachable .
Reply from 10.0.0.10 : destination host unreachable .
Reply from 10.0.0.10 : destination host unreachable .
Reply from 10.0.0.10 : destination host unreachable .
Ping statistics for 40.0.0.1 :
Packets : sent = 4 , recieved = 0, lost = 4 (100% loss).

2. PC > Ping 10.0.0.10 with 32 bytes of data :

Reply from 10.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.10 : bytes = 32 time = 0ms . TTL = 255
Ping statistics for 10.0.0.10 :
Packets : sent = 4 , Recieved = 4 , lost = 0 (0% lost)

3. PC > Ping 20.0.0.10 with 32 bytes of data :

Reply from 20.0.0.10 : bytes = 32 time = 1ms TTL = 255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 20.0.0.10 : bytes = 32 time = 0ms. TTL = 255
Ping statistics for 20.0.0.10 :
Packets : sent = 4 , recieved = 4 , lost = 0 (0% loss)

4. PC> Ping 30.0.0.10

Pinging 30.0.0.10 with 32 bytes of data

Reply from 30.0.0.10: bytes = 32 time = 1ms TTL = 254
Reply from 30.0.0.10: bytes = 32 time = 1ms TTL = 254
Reply from 30.0.0.10: bytes = 32 time = 1ms TTL = 254
Reply from 30.0.0.10: bytes = 32 time = 8 ms. TTL = 254.

ping statistics for 30.0.0.10:
packets: sent = 4, recieved = 4, lost = 0, (0% loss).

5. PC ping > 40.0.0.1

pinging 40.0.0.1 with 32 bytes of data:

Request timed out.
Reply from 40.0.0.1: bytes = 32 time = 10ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 13ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 8ms TTL = 125

Ping statistics for 40.0.0.1:
Packets: sent = 4, recieved = 3, lost = 1 (25% loss).

6. PC Ping > 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data.:

Reply from 40.0.0.1: bytes = 32 time = 2ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 24ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 9ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 9ms. TTL = 125

Ping statistics for 40.0.0.1:
packets: sent = 4, recieved = 4, lost = 0 (0% loss)

Learnings :- Before training the network, we get the result as destination host unreachable
After training the routers, we get classification of the result.