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MIME
Master's degree ICT Internet Multimedia Engineering

Department of Information Engineering (DEI)
Master degree on ICT for Internet and Multimedia Engineering (MIME)

Internet

Introduction on LAB3

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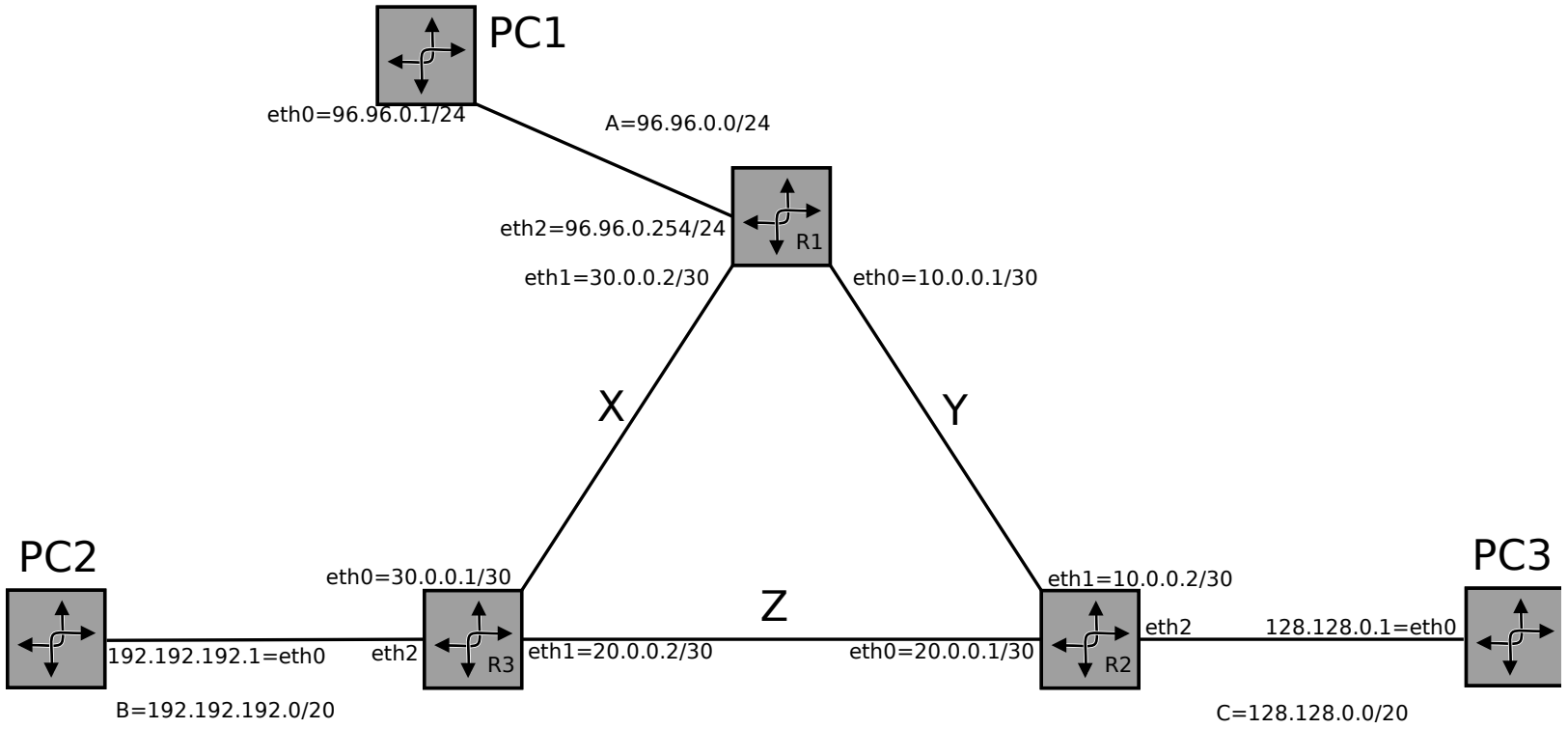
LAB3 Experience: Review on routing

- OBJECTIVE: Every device should be able to ping any other device.

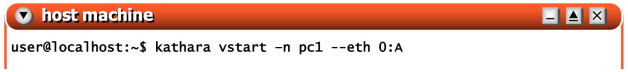


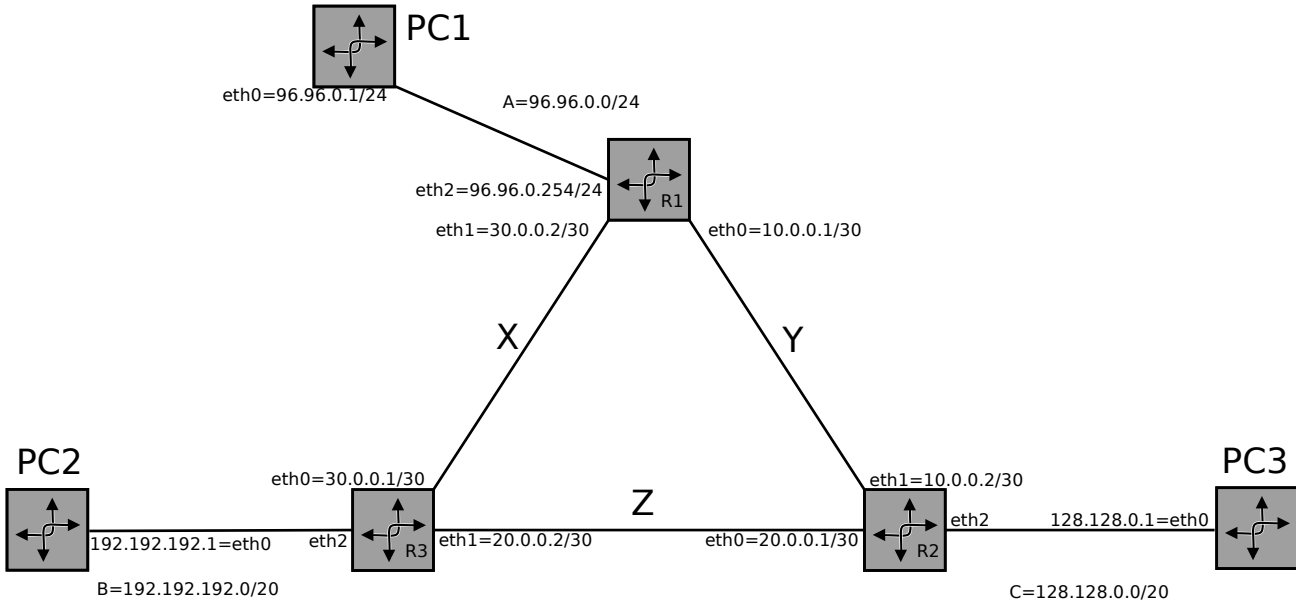
Create nodes

- kathara vstart –n PC1 --eth **0:A**
- kathara vstart –n R1 --eth **0:Y 1:X 2:A**
- …

From LAB1

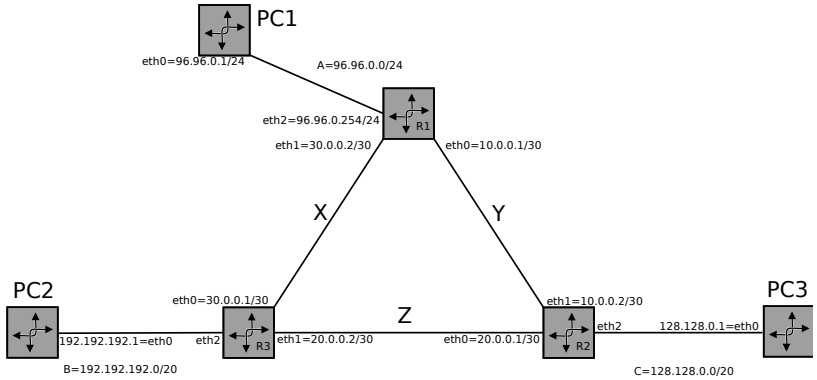
step 1 – creating the vms





Configure IP addresses

- PC1:
  - ifconfig eth0 96.96.0.1 netmask 255.255.255.0 broadcast 96.96.0.255 up
- R1:
  - ifconfig eth0 10.0.0.1 netmask **255.255.255.252** broadcast **10.0.0.3** up
  - ifconfig eth1 30.0.0.2 netmask **255.255.255.252** broadcast **30.0.0.3** up
  - ifconfig eth2 96.96.0.254 netmask **255.255.255.0**broadcast **96.96.0.255** up
- …

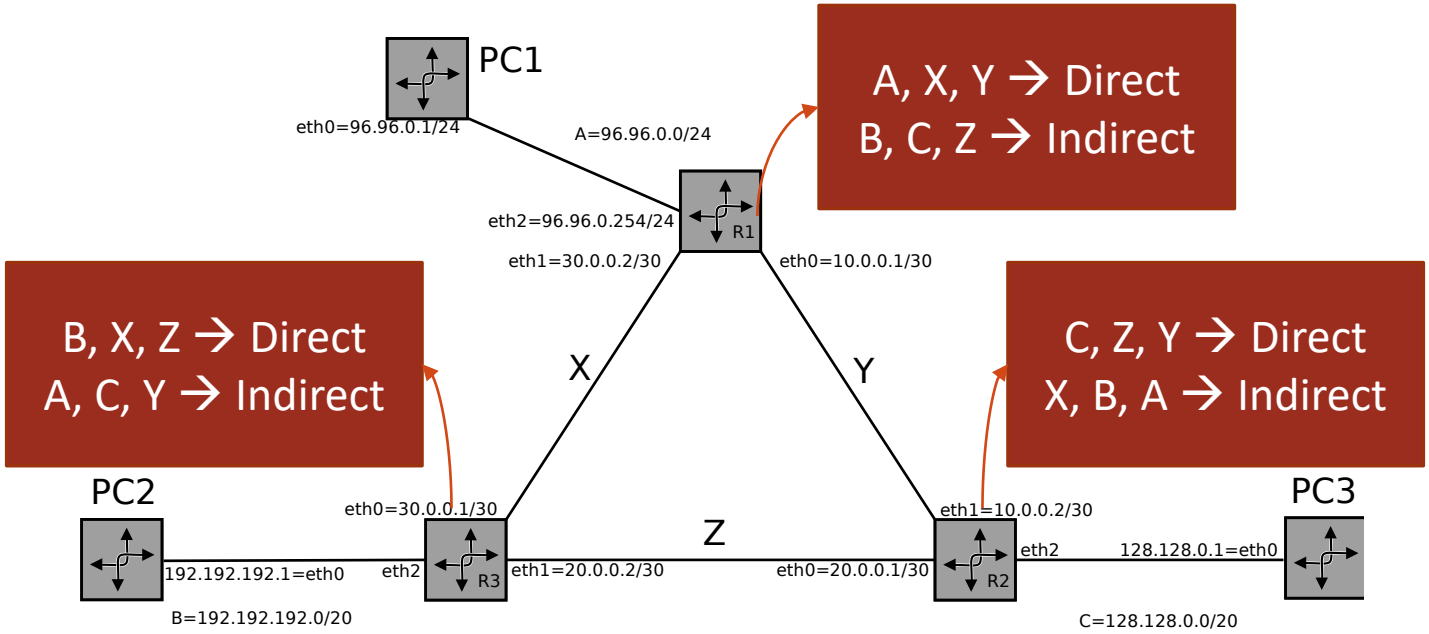


From LAB1

step 2 – configuring network interfaces

Configure routing tables

- In order to enable full connectivity, add the appropriate routing entries to PCs' and routers' routing tables. Each PC should be able to reach all other PCs in the network (each PC must be able to ping all interfaces, i.e., all IP addresses, of any other PC).



Configure routing tables

- **For hosts: default gateway**
- We specify the default route on the PCs: "through this gateway (IP number) you can reach all the other networks"

From LAB2

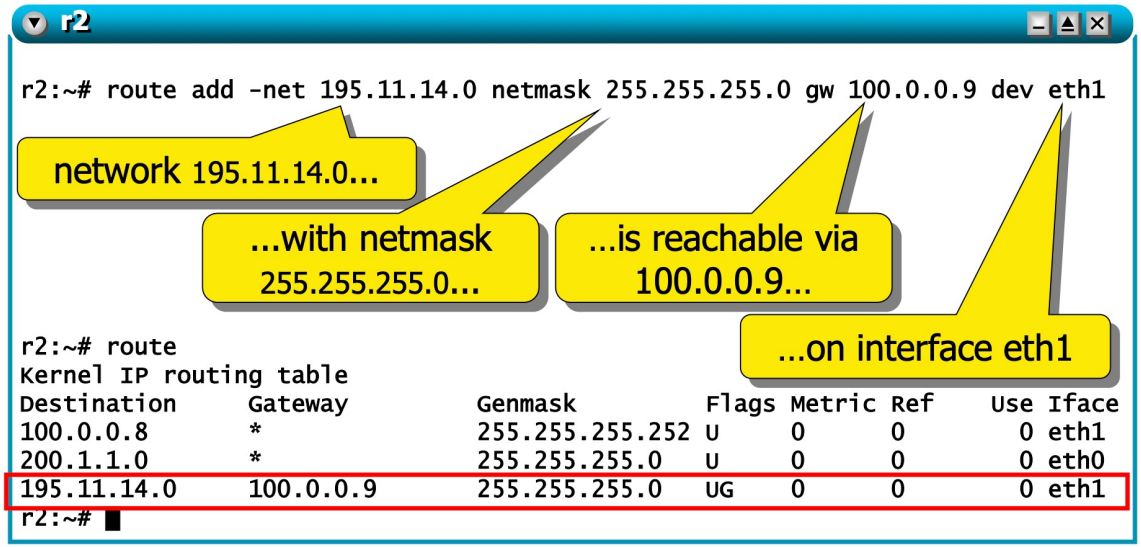
pc1

```
pc1:~# route add default gw 195.11.14.1
pc1:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
195.11.14.0     *               255.255.255.0   U     0      0        0 eth0
default         195.11.14.1     0.0.0.0         UG    0      0        0 eth0
pc1:~#
```

Configure routing tables

- For routers: add static routes
  - **Warning: It is NOT allowed to add DEFAULT GATEWAY ROUTES, i.e., only static routes should be configured.**

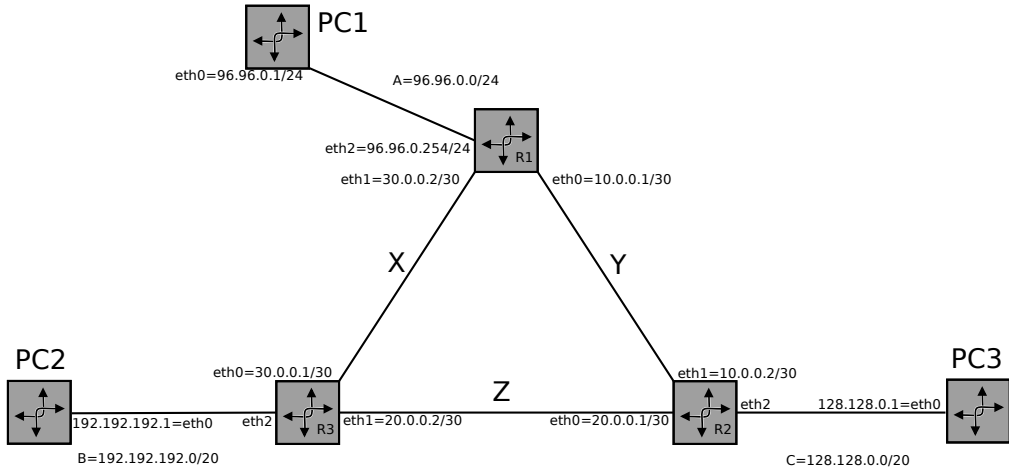
From LAB2



Exercise

- Make it sure that all the hosts/routers can ping with **all the other interfaces of all the hosts/routers** within the networks.
- For example, R1 should ping with:
  - Eth0 of pc1
  - Eth0 of pc2
  - Eth0 of pc3
  - Eth0, eth1, eth2 of R2
  - Eth0, eth1, eth2 of R3

TRY ALL THE PINGS!!



Exercise

- How would the routing tables of the intermediate routers change if default gateways could be used? Would it be more efficient?

Exercise

- When all networks are connected, perform a `traceroute` command from one end of the topology to the other. Check with WireShark the header fields of the IP packets that are exchanged during the traceroute and describe how packets find intermediate connections.