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EE462

Design a network infrastructure for Company A

Infrastructure :

Design a network for three branches which has three VLAN (1- admin 2- employee 3- public).

Way of VLAN network allocate between three branches:

For Admin:

Network ID:192.168.0.0

Start :192.168.0.1

Last IP:192.168.3.254

Broad cast:192.168.3.255

For Employee :

Network ID:192.168.10.0

First IP:192.168.10.1

Last IP:192.168.13.254

Broad cast :192.168.13.255
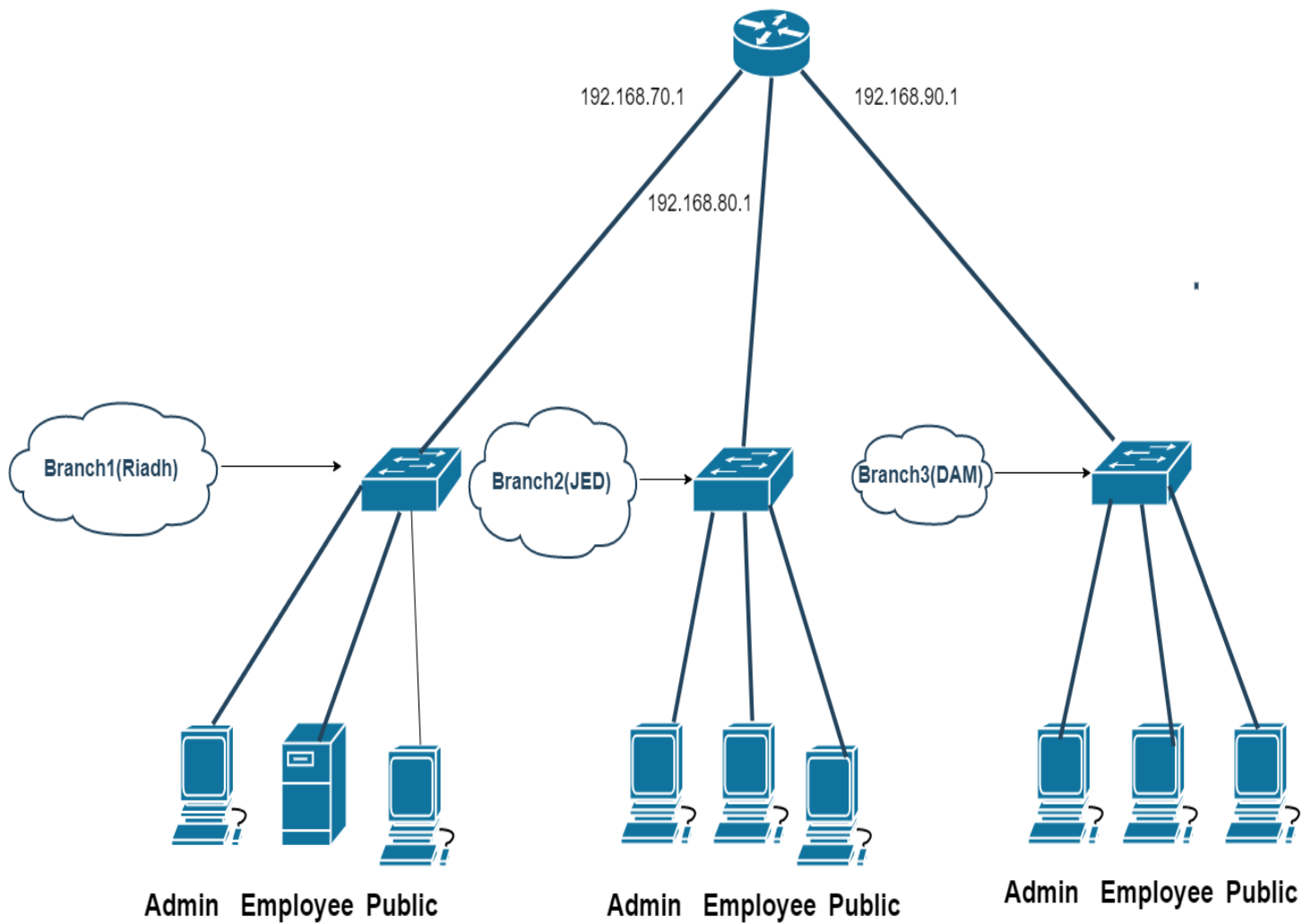

For Public :

Network ID:192.168.20.0

First IP :192.168.20.1

Last IP :192.168.20.191

Broad cast:192.168.20.192

Basic structure of Network

192.168.70.1   192.168.90.1

192.168.80.1

Branch1(Riadh)

Branch2(JED)

Branch3(DAM)

Admin Employee Public

Admin Employee Public
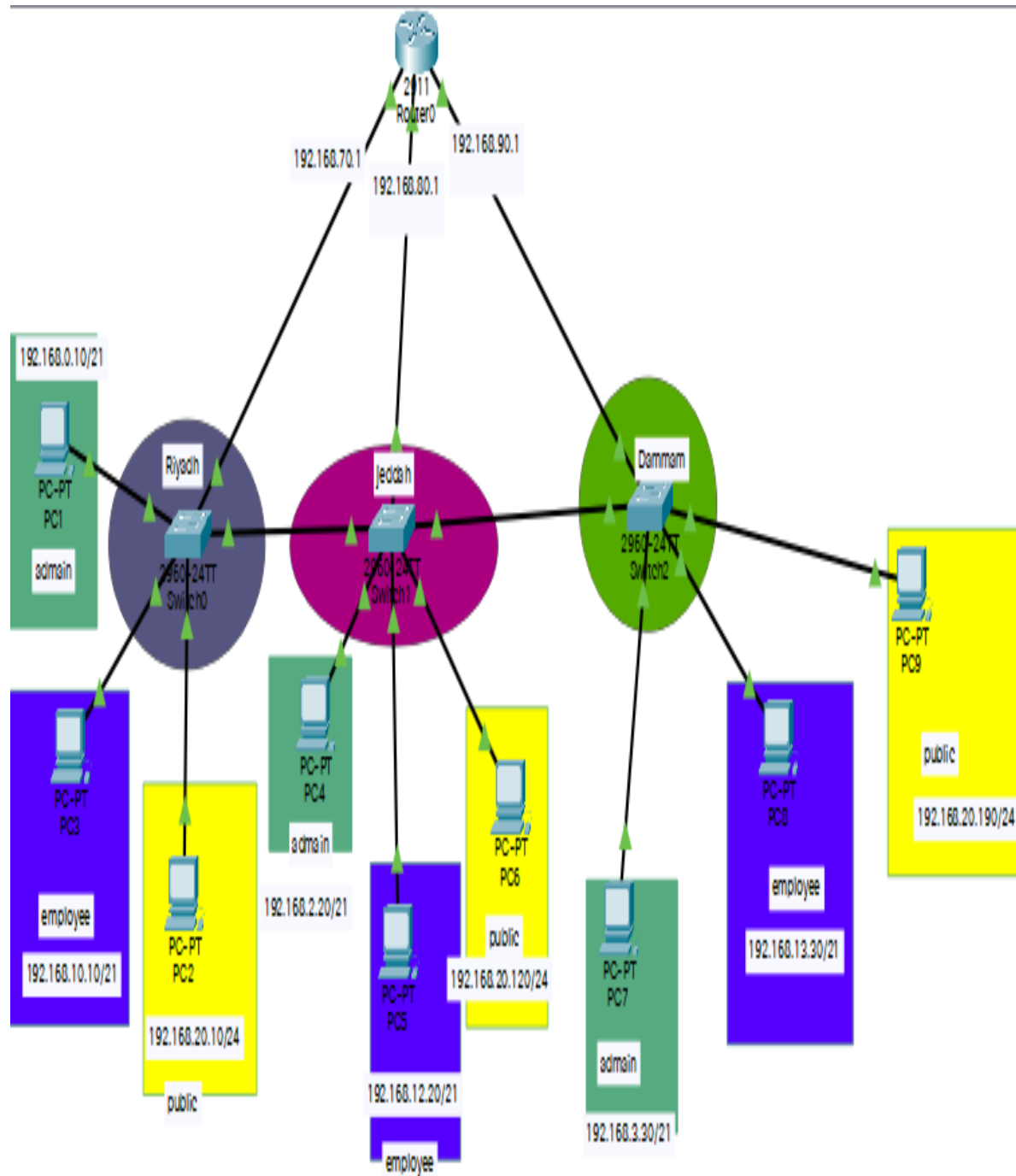
Admin Employee Public

Admin Address :192.168.0.0/21

Employee Address :192.168.10.0/21

Public Address :192.168.20.0/24

From cisco packet tracer :

Testing

from Riadh to Damam

```
Pinging 192.168.20.190 with 32 bytes of data:

Reply from 192.168.20.190: bytes=32 time<1ms TTL=127
Reply from 192.168.20.190: bytes=32 time<1ms TTL=127
Reply from 192.168.20.190: bytes=32 time<1ms TTL=127
Reply from 192.168.20.190: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.190:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.13.30

Pinging 192.168.13.30 with 32 bytes of data:

Reply from 192.168.13.30: bytes=32 time<1ms TTL=127
Reply from 192.168.13.30: bytes=32 time<1ms TTL=127
Reply from 192.168.13.30: bytes=32 time<1ms TTL=127
Reply from 192.168.13.30: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.13.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.3.30

Pinging 192.168.3.30 with 32 bytes of data:

Reply from 192.168.3.30: bytes=32 time=1ms TTL=128
Reply from 192.168.3.30: bytes=32 time=1ms TTL=128
Reply from 192.168.3.30: bytes=32 time<1ms TTL=128
Reply from 192.168.3.30: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.3.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
```

Testing from Jeddah o Damam

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.13.30

Pinging 192.168.13.30 with 32 bytes of data:

Reply from 192.168.13.30: bytes=32 time<1ms TTL=128
Reply from 192.168.13.30: bytes=32 time<1ms TTL=128
Reply from 192.168.13.30: bytes=32 time<1ms TTL=128
Reply from 192.168.13.30: bytes=32 time=2ms TTL=128

Ping statistics for 192.168.13.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 192.168.20.190

Pinging 192.168.20.190 with 32 bytes of data:

Reply from 192.168.20.190: bytes=32 time<1ms TTL=127
Reply from 192.168.20.190: bytes=32 time<1ms TTL=127
Reply from 192.168.20.190: bytes=32 time=1ms TTL=127
Reply from 192.168.20.190: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.190:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.3.30

Pinging 192.168.3.30 with 32 bytes of data:

Reply from 192.168.3.30: bytes=32 time<1ms TTL=127
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.3.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Testing from Jeddah to Riadh

```
Pinging 192.168.0.10 with 32 bytes of data:

Reply from 192.168.0.10: bytes=32 time=28ms TTL=128
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 28ms, Average = 7ms

C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
```

Total of admin 500+25+50

Total of employee → 400+200+40 ⎱ in all branches

Total of Public → 160 ⎰

for admin → $2^{10} = 1024$ | for employee

So | 192.168.0.0/21 | | | 192.168.10.0/21 |
⎰ 192.168.0.1 | 192.168.10.1
⎰ 192.168.0.255 | ⎰ 192.168.10.255

⎛ 192.168.1.0 | 192.168.11.0
⎝ 192.168.1.255 | 192.168.11.255

192.168.2.0 | 192.168.12.0

192.168.2.255 | 192.168.12.255

⎛ 192.168.3.0 | 192.168.13.0
⎝ 192.168.3.255 | 192.168.13.255

for Public (192.168.20.0 / 24)
192.168.20.1
192.169.20.192