Denmark Teknik university

Bashar Khaled Bdewi – S183356

06_04_2020

2nd half of Mandatory assignment 2

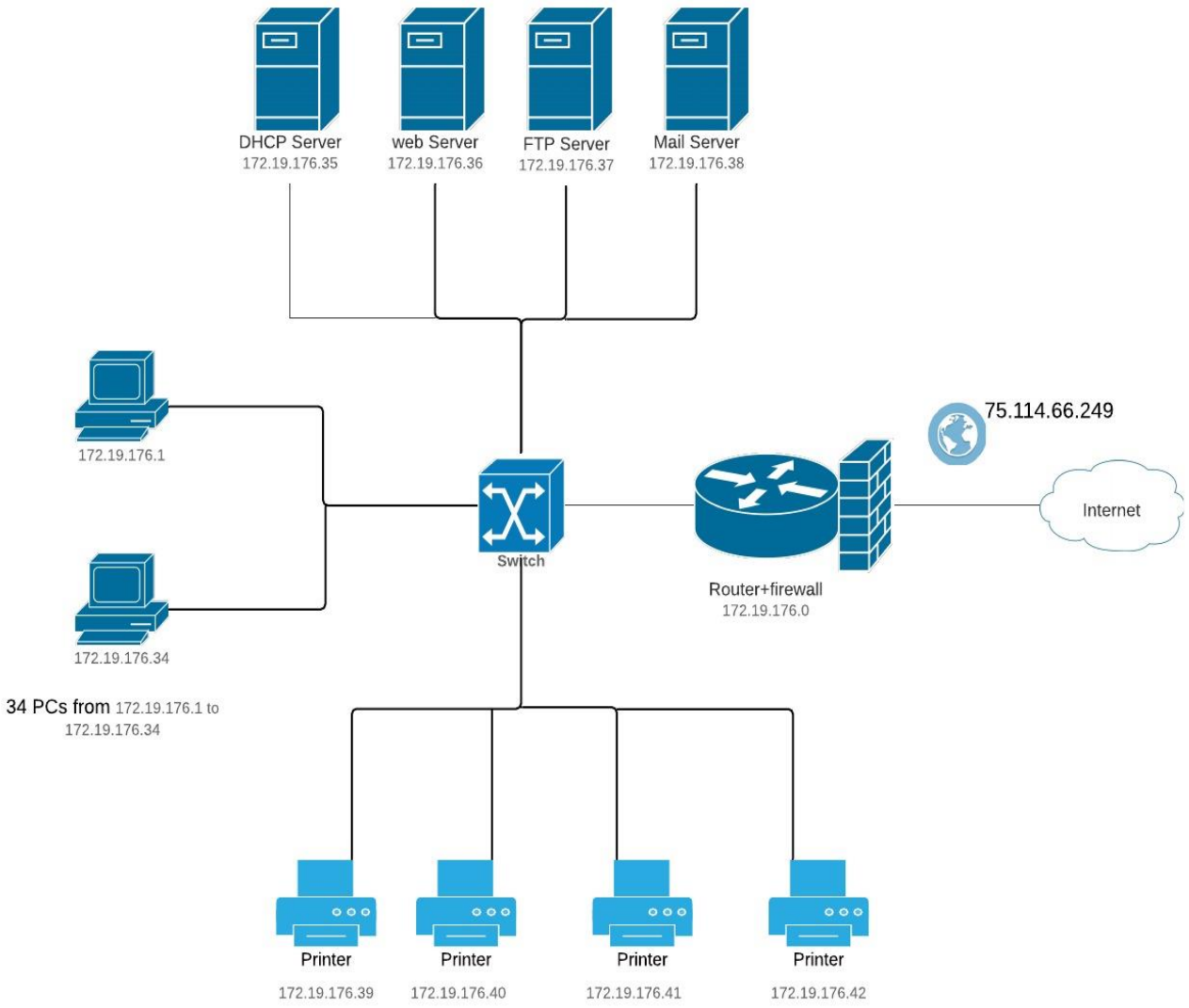
Design a private network meant for a small business

We need to design a network using the mentioned constraints, that can support the mentioned devices in the following list.

- The company will have one global IP that is 75.114.66.249.
- The network is using RFC1918 addressing https://tools.ietf.org/html/rfc1918 and has the subnet mask 255.255.255.192.
- The network will have 34 PCs that can reach the internet.
- The network will have 4 network printers that cannot be reachable from the internet.
- The network will have a web-server reachable from the internet.
- The network will have an FTP-server reachable from the internet.
- The network will have a mail-server reachable from the internet.

A cable to connect the devices to the switch over the network.

Her is a Design diagram that shows how the hardware components are connected.



Ports in the different rules as only these ports have access

Rule 1: Allows the PCs to access the Internet

Rule 2: Allows the Web server to access the Internet

Rule 3: Gives the Mail server access to the Internet

Rule 4: Allows the FTP server to access the Internet

Rule 5: Block all other traffic

Firewall rules

Rule nr.	Source		Distenation		Protocol	Action
	port	IP	IP	Port		
1	-	-	172.19.176.1..... 172.19.176.34	-	-	Accept
2	-	-	192.168.1.36	80	TCP	Accept
3	-	-	192.168.1.38	25	TCP	Accept
4	-	-	192.168.1.37	21	TCP	Accept
5	-	-			-	Refuse

Dynamic Addresses: The PCs are assigned dynamic local addresses. These components are assigned unique ports to connect to the Internet. See the Nat table.

DHCP	
Static	192.168.1.35..... 192.168.1.42
Dynamic	172.19.176.1..... 172.19.176.34

The printers and servers are assigned static addresses. These components must be intentionally connected. Only the servers are connected to the internet using the NAT table.

Network Address Translation (NAT) is the process where a network device, usually a firewall, assigns a public address to a computer (or group of computers) inside a private network. The main use of NAT is to limit the number of public IP addresses an organization or company must use, for both economy and security purposes.

The NAT Table

WAN side	LAN side
75.114.66.249,80	192.168.1.36
75.114.66.249,25	192.168.1.38
75.114.66.249,21	192.168.1.37
75.114.66.249,....	172.19.176.1..... 172.19.176.34

We show the network components in this table:

Device	Number	Local IP	Global IP
Router	1	172.19.176.0	75.114.66.249
Switch	1		
Printer	4	172.19.176.39..... 172.19.176.41	
DHCP Server	1	172.19.176.35	
Web server	1	172.19.176.36	
Mail server	1	172.19.176.37	
FTP server	1	172.19.176.38	
PC	34	172.19.176.1..... 172.19.176.34	

Global IP adresse: 75.114.66.249
Subnet mask: 255.255.255.192
Broadcast: 192.168.1.63