BATCH : BATCH 85

LESSON : **Network -6**

DATE : 24.06.2022

SUBJECT : **IP Subnetting and CIDR**

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Previous Session

IP Address Blocks
Network ID
Host ID
Subnet ID
Subnet Mask
AND operation
NAT

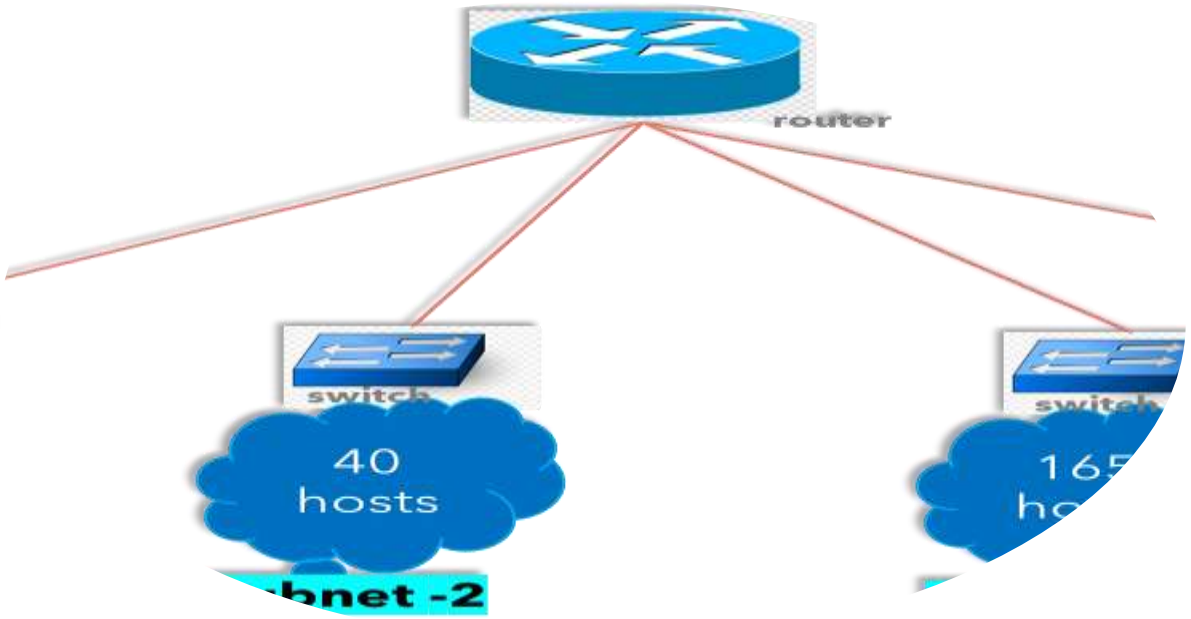
NETWORK Day 6

Contents

- IP Subnetting
- CIDR

What is IP Subnetting?

- A subnetwork or **subnet** is a logical subdivision of an **IP** network. The practice of dividing a network into two or more networks is called **subnetting**.



Why IP Subnetting?

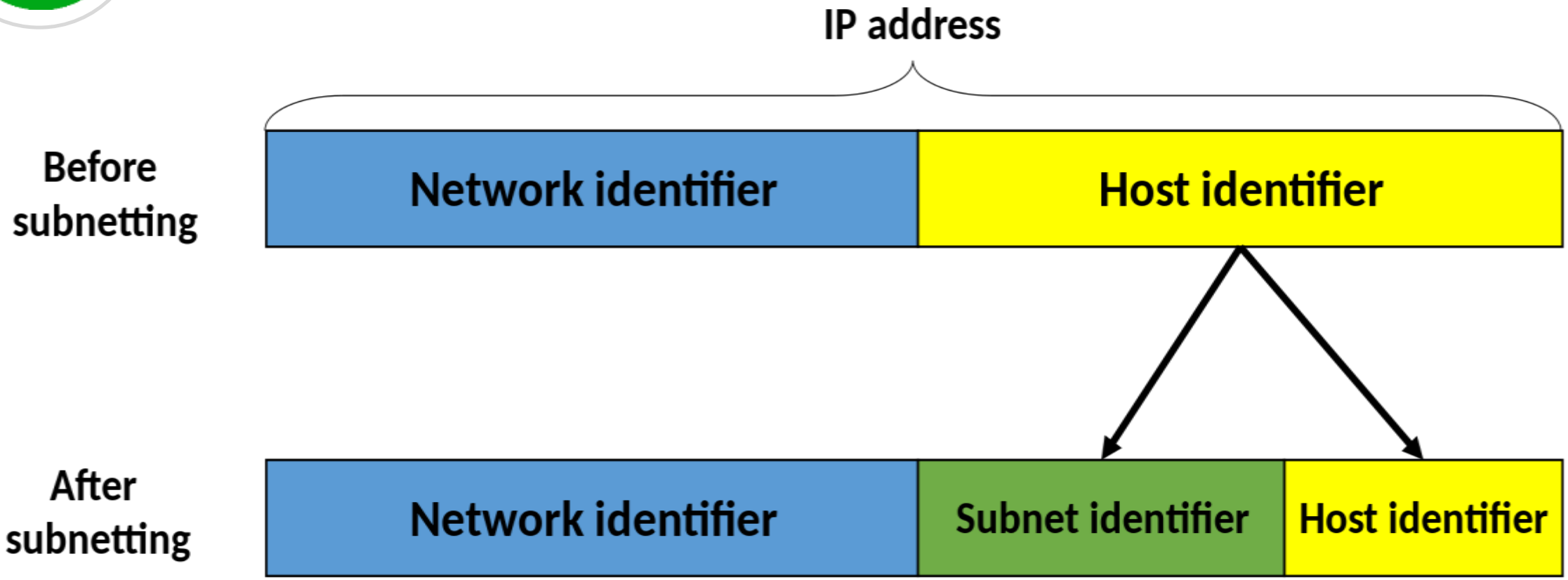
- **Subnetting** helps to reduce the network traffic and conceals network complexity
- **Subnetting** is essential when a single network number has to be allocated over numerous segments of a local area network (LAN)
- **Subnets** were initially designed for solving the shortage of IP addresses over the Internet

How does it work?

- IP subnetting results in the logical division of an **IP** address into two fields: **the network number** or routing prefix and the rest field or **host identifier**.

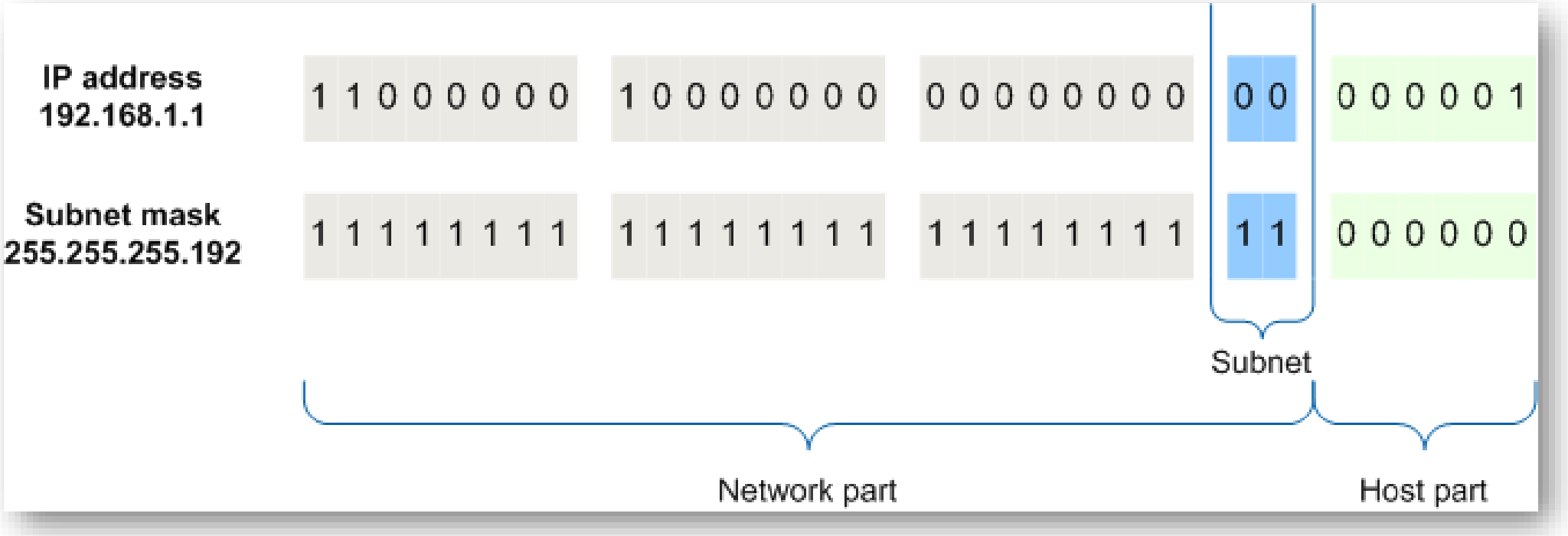
- In subnetting we borrow some bits from host-idetifier to use as subnetwork

IP Subnetting



Subnetting IPv4 Adresses

- A network created by Class A,B,C IP address can be divided into subnets by a system admin.
- It is done by borrowing bits from host part



Subnetting IPv4 Adresses

192.168.1.1 and Mask **255.255.255.192**

Broadcast address

➡ **192.168.1.63**

A Host/ip address

➡ **192.168.1.62**

Network address/id

➡ **192.168.1.0**

CIDR Classless Inter Domain Routing

IP address **192.168.0.96 and** Mask **255.255.255.0**

This IP address is in CIDR notation, which is a compact way of including the subnet mask along with the address. The /24 tells you that the first 24 bits of the IP address are used for network routing.

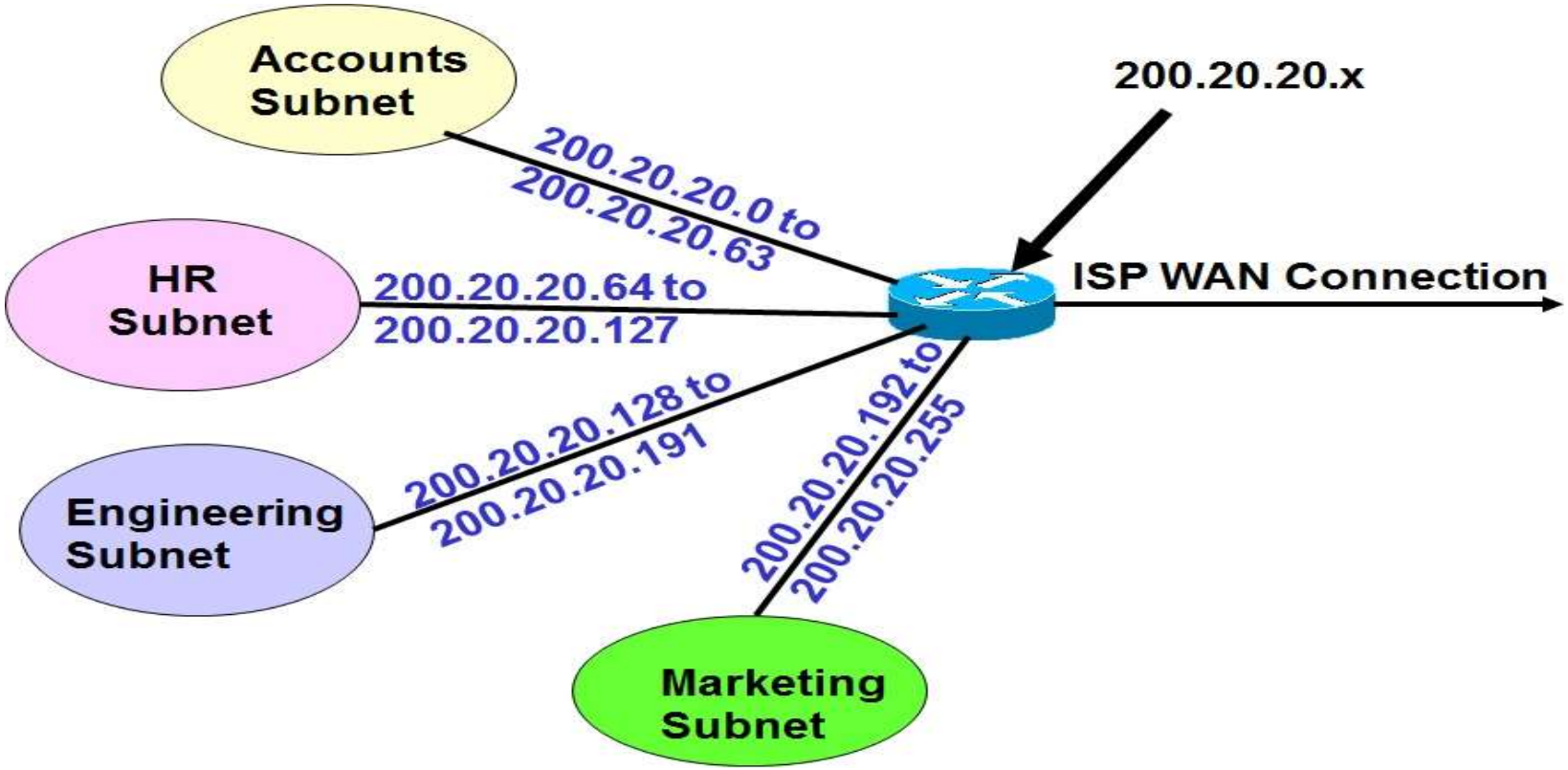
CIDR

Total number of Hosts: $2^{32-24}-2 = 254$

CIDR

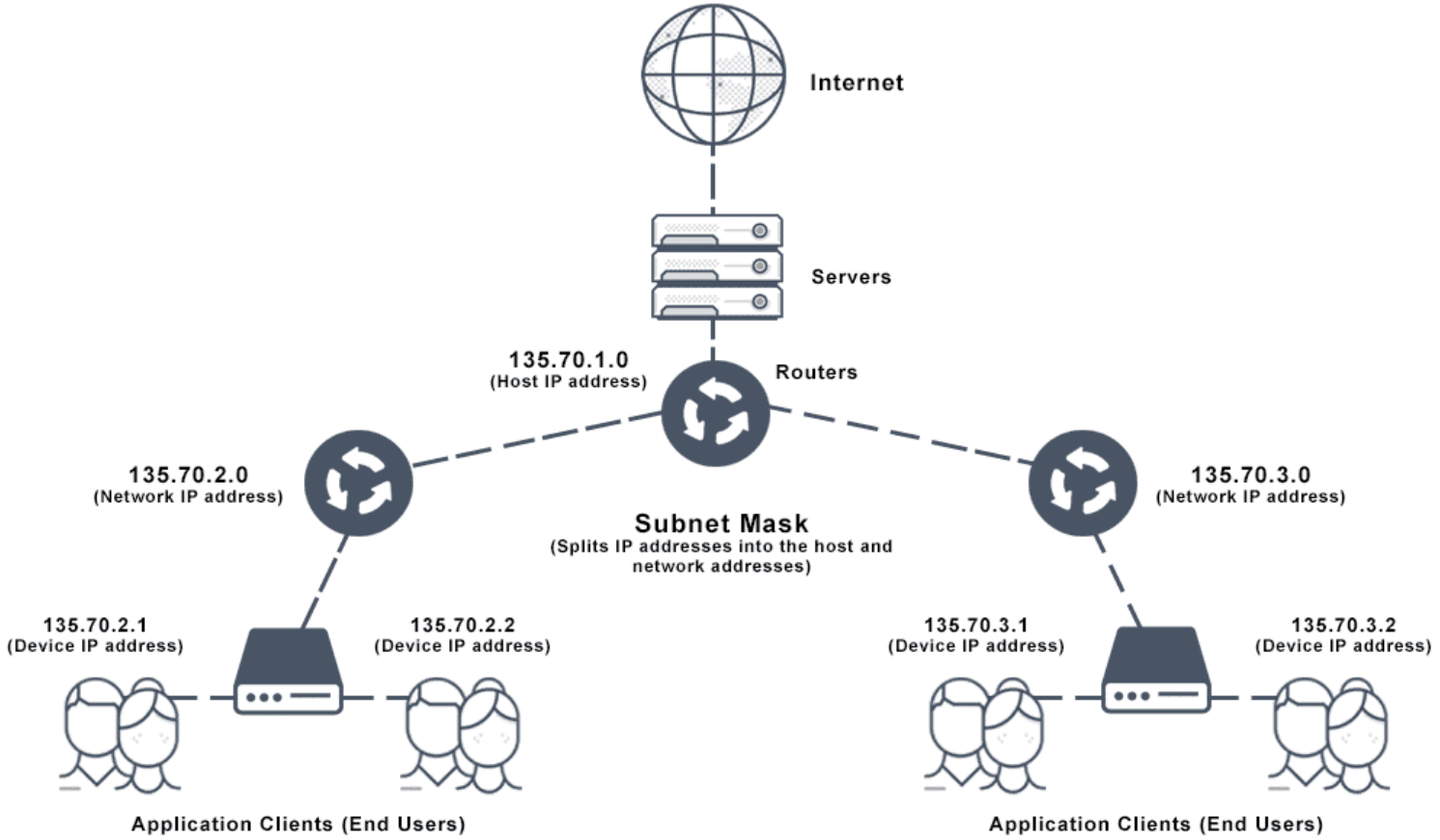
Total number of Hosts: $2^{32-23}-2 = 510$

Examples

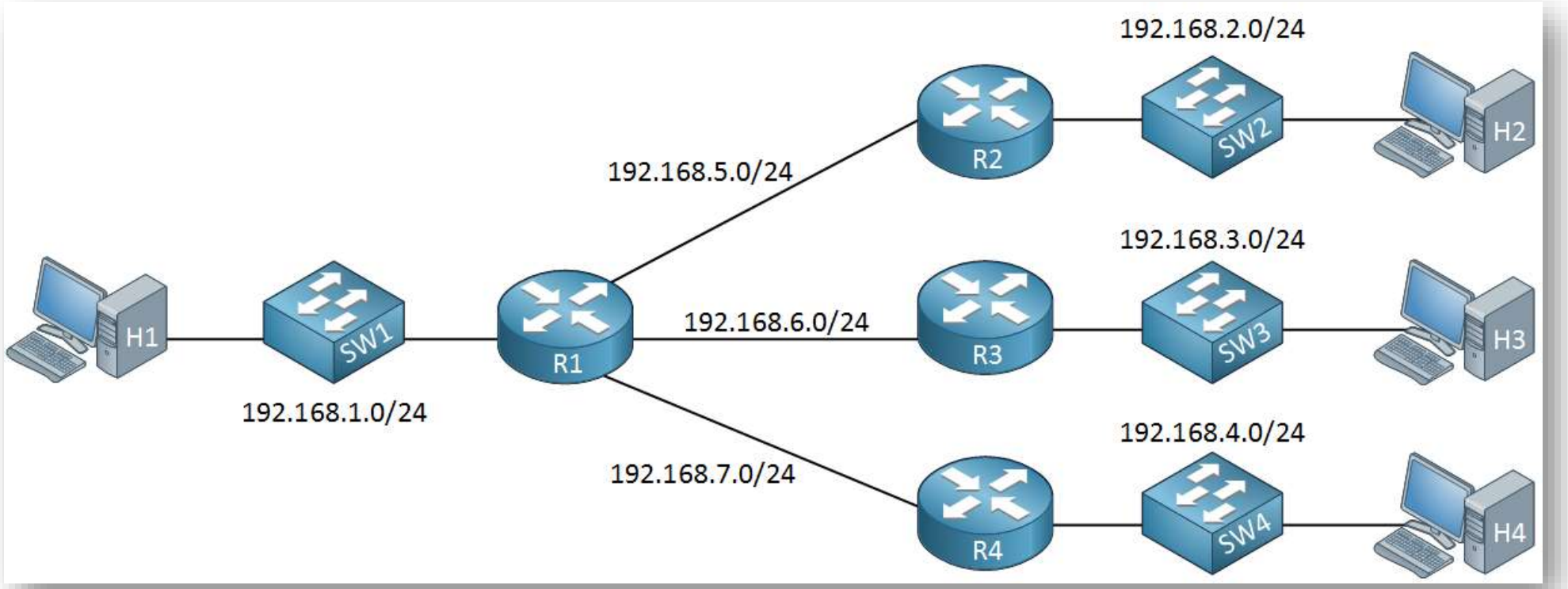


- *A corporate network which has 4 subnets

Examples


Internet
Servers
135.70.1.0
(Host IP address)
Routers
135.70.2.0
(Network IP address)
135.70.3.0
(Network IP address)
Subnet Mask
(Splits IP addresses into the host and network addresses)
135.70.2.1
(Device IP address)
135.70.2.2
(Device IP address)
135.70.3.1
(Device IP address)
135.70.3.2
(Device IP address)
Application Clients (End Users)
Application Clients (End Users)

Examples


192.168.2.0/24
R2
SW2
H2
192.168.5.0/24
192.168.3.0/24
H1
SW1
R1
192.168.6.0/24
R3
SW3
H3
192.168.1.0/24
192.168.4.0/24
192.168.7.0/24
R4
SW4
H4

Examples

Private IP address space	
From	**To**
10.0.0.0	10.255.255.255
172.16.0.0	172.31.255.255
192.168.0.0	192.168.255.255

10.0.0.1
10.0.0.2

10.0.1.1
10.0.1.2

10.10.10.1
10.10.10.2

192.168.1.1
192.168.1.2

192.168.10.10
192.168.10.11

192.168.11.10
192.168.11.11