1. Introduction

Network purpose: give ability to communicate, publicly or privately

IP 32 bit(4 octets) address, used for internet. It cannout uniquely identify device.

1.1. Classful and classless

To controll usage of IP's was invented Classful addresation.(deprecated)

Has limit, for all subnets use one mask.

Класс	Первые биты	Начальный адрес	Конечный адрес
A	0	0.0.0.0	127.255.255.255
B	10	128.0.0.0	191.255.255.255
C	110	192.0.0.0	223.255.255.255
D	1110	224.0.0.0	239.255.255.255
E	1111	240.0.0.0	255.255.255.255

Class A:

network	host	host	host

To distinct network and host used **mask** Class A mask: 255.0.0.0

Class B:

network	network	host	host

Class B mask: 255.255.0.0

Class C:

network	network	network	host

Class C mask: 255.255.255.0

Subnet is a logical(possibly recursive) subdivision of an IP network.

Usecases: efficient allocation in large organizations. May be used to create tree structure.

All hosts in the same subnet have the same network.

Task: 172.16.0.0 - make 120 subnets with 180 hosts, write mask.

1.2. Private vs public subnet in aws

Private subnet can have outgress to Internet, but to ingress to Internet. Can have ingress rules only for other subnets/VPCs.

Public subnet instances from this type can be accessible From the Intenet, public IPs are auto assigned from aws pool.

1.3. Public, private addresses and CIDR

To determine local network vs global network used separation.

Reservations list:

Local network:
1. 10.0.0.0 — 10.255.255.255 with mask 255.0.0.0 (or just 10/8).
2. 172.16.0.0 — 172.31.255.255 with mask 255.240.0.0 (or just 172.16/12).
3. 192.168.0.0 — 192.168.255.255 (or just 192.168/16).

Other:
1. 0.0.0.0/8 - self identify (when using DHCP)
2. 127.0.0.0/8 - loopback
3. 224.0.0.0/4 - multicast
4. 169.254.0.0/16 — link-local address

Multicast send one IP datagram to many recievers, actually sent one, but routers and switches duplicate.

192.168.1.0/24
1. Подсеть на 120 адресов.
2. Подсеть на 12 адресов.
3. Подсеть на 5 адресов.

Найдите и запишите в каждой подсети ее
- адреса
- широковещательный адрес
- пул разрешенных к выдаче адресов
- маску

Let's start from one small, advice says, that should start with large, but no provided description, so :D

1.

Size is 8

Address - 192.168.1.0

Multicast - 192.168.1.7

Pull is - 192.168.1.1 - 192.168.1.6

Mask - 255.255.255.(256-8) = 255.255.255.248

2.

Size is 16

Address - 192.168.1.8

Multicast - 192.168.1.23

Pull is - 192.168.1.9 - 192.168.1.22

Mask - 255.255.255.(256-16) = 255.255.255.240

3.

Size is 128

Address - 192.168.1.24

Multicast - 192.168.1.151

Pull is - 192.168.1.25 - 192.168.1.150

Mask - 255.255.255.(256-128) = 255.255.255.128