Laporan Prak Konjar

Subnetting

Nama : Muhammad Hafid Azis

Kelas : 2D4 ITB

NRP : 3121600055

PROGRAM STUDI D4 TEKNIK INFORMATIKA

POLITEKNIK ELEKTRONIKA NEGERI SURABAYA

2021/2022

Soal

1. **Diberikan network dengan IP 100.0.0.0/8 , ada 5 network dengan kebutuhan host 10000, 300, 500, 700, 1500.**
    - Sebutkan Netmask yang baru
      rumus : $2^n - 2 >= 10000$
      n = 14

      total bit – n
      32 – 14 = /18
      netmask baru /18 = 255.255.192.0

    - Berapa network dan host yang terbentuk
      Network
      m = netmask baru – netmask class ip awal
      18 – 8 = 10
      $2^m = 2^{10} = 1024$

      Host
      $2^n - 2 = 2^{14} - 2 = 16382$

    - sebutkan 2 network pertama dan 2 network terakhir
      Rumus
      total subnet mask – netmask baru (256 -192 = 64)
      2 Network awal
      100.0.0.0
      100.0.64.0

      2 Network akhri
      100.255.0.0
      100.255.192.0

    - sebutkan range hostt tiap network bersama broadcastnya

Network	Ip Awal	Ip Akhir	Broadcast
100.0.0.0	100.0.0.1	100.0.63.254	100.0.63.255
100.0.64.0	100.0.64.1	100.0.127.254	100.0.127.255

Network	Ip Awal	Ip Akhir	Broadcast
100.255.0.0	100.255.0.1	100.255.63.254	100.255.63.255
100.254.192.0	100.254.192.1	100.254.255.254	100.254.255.255

2. **Diberikan network dengan IP 10.0.0.0/8 , ada 5 network dengan kebutuhan host 100, 300, 500, 700, 50.**

Sebutkan Netmask yang baru

rumus : $2^n - 2 >= 700$

n = 10

total bit – n

32 – 10 = /22

netmask baru /22 = 255.255.252.0

Berapa network dan host yang terbentuk

Network

m = netmask baru – netmask class ip awal

22 – 8 = 14

$2^m = 2^{14} = 16384$

Host

$2^n - 2 = 2^{10} - 2 = 1022$

sebutkan 5 network pertama dan 5 network terakhir

Rumus

total subnet mask – netmask baru (256 -252 = 4)

5 Network awal

10.0.0.0

10.0.4.0

10.0.8.0

10.0.12.0

10.0.16.0

5 Network akhri

10.255.252.0

10.255.248.0

10.255.244.0

10.255.240.0

10.255.236.0

sebutkan range hostt tiap network bersama broadcastnya

Network	Ip Awal	Ip Akhir	Broadcast
10.0.0.0	10.0.0.1	10.0.3.254	10.0.3.255
10.0.4.0	10.0.4.1	10.0.7.254	10.0.7.255
10.0.8.0	10.0.8.1	10.0.11.254	10.0.11.255
10.0.12.0	10.12.1	10.0.15.254	10.0.15.255
10.0.16.0	10.0.16.1	10.0.19.254	10.0.19.255

Network	Ip Awal	Ip Akhir	Broadcast
10.255.252.0	10.255.252.1	10.255.225.254	10.255.255.255
10.255.248.0	10.255.248.1	10.255.251.254	10.255.251.255
10.255.244.0	10.255.244.1	10.255.247.254	10.255.247.255
10.255.240.0	10.255.240.1	10.255.243.254	10.255.243.255
10.255.236.0	10.255.236.1	10.255.239.254	10.255.239.255

3. **Diberikan network dengan IP 172.30.0.0/16, ada 5 network dengan kebutuhan host 1000, 300, 500, 700**

sebutkan netmask baru

rumus : $2^n - 2 >= 1000$
n = 10

total bit – n
32 – 10 = /22
netmask baru /22 = 255.255.252.0

berapa network dan host yang dapat terbentuk

Network
m = netmask baru – netmask class ip awal
22 – 16 = 6
$2^m = 2^6 = 64$

Host

$2^n - 2 = 2^{10} - 2 = 1022$

sebutkan 5 network pertaman dan 5 network terakhir

Rumus
total subnet mask – netmask baru (256 -252 = 4)
5 Network awal
172.30.0.0
172.30.4.0
172.30.8.0
172.30.12.0
172.30.16.0

5 Network akhri
172.30.252.0
172.30.248.0

172.30.244.0
172.30.240.0
172.30.236.0

sebutkan range host tiap network bersama broadcastnya

NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
172.30.0.0	172.30.0.1	172.30.3.254	172.30.3.255
172.30.4.0	172.30.4.1	172.30.7.254	172.30.7.255
172.30.8.0	172.30.8.1	172.30.11.254	172.30.11.255
172.30.12.0	172.30.12.1	172.30.15.254	172.30.15.255
172.30.16.0	172.30.16.1	172.30.19.254	172.30.19.255

NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
172.30.252.0	172.30.252.1	172.30.255.254	172.30.255.255
172.30.248.0	172.30.248.1	172.30.251.254	172.30.251.255
172.30.244.0	172.30.224.1	172.30.247.254	172.30.247.255
172.30.240.0	172.30.240.1	172.30.223.254	172.30.223.255
172.30.236.0	172.30.236.1	172.30.239.254	172.30.239.255

4. **Diberikan network dengan IP 200.10.4.0/24, jumlah host yang dibutuhkan maksimum 5**

sebutkan netmask yang baru
rumus $2^n - 2 >= 5$
n = 3

total bit – n
32 – 3 = /29
netmask baru = /29 = 255.255.255.248

berapa network dan host yang dapat terbentuk
Network
m = netmask baru – netmask class ip awal
29 – 24 = 5
$2^m = 2^5 = 32$

Host
$2^n - 2 = 2^3 - 2 = 6$

Sebutkan 5 network pertama dan 5 network terakhir
rumus
total subnetmask – netmask baru (256 – 248 = 8)

Network awal
200.10.4.0
200.10.4.8
200.10.4.16
200.10.4.24
200.10.4.32

Network akhir
200.10.4.248
200.10.4.240
200.10.4.232
200.10.4.224
200.10.4.216

Sebutkan range host tiap network bersama broadcastnya

NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
200.10.4.0	200.10.4.1	200.10.4.6	200.10.4.7
200.10.4.8	200.10.4.9	200.10.4.15	200.10.4.16
200.10.4.16	200.10.4.17	200.10.4.22	200.10.4.23
200.10.4.24	200.10.4.25	200.10.4.30	200.10.4.31
200.10.4.32	200.10.4.33	200.10.4.38	200.10.4.39

NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
200.10.4.248	200.10.4.249	200.10.4.254	200.10.4.255
200.10.4.240	200.10.4.241	200.10.4.246	200.10.4.247
200.10.4.232	200.10.4.233	200.10.4.238	200.10.4.239
200.10.4.224	200.10.4.225	200.10.4.230	200.10.4.231
200.10.4.216	200.10.4.217	200.10.4.222	200.10.4.223

5. **Diberikan network dengan IP 60.0.0.0/8, ada dengan kebutuhan network 2000**

sebutkan netmask yang baru
rumus $2^m >= 2000$
$m = 11 = 2^{11}$

netmask class ip saat ini + m
8 + 11 = 19
netmask /19 = 255.255.224.0

berapa network dan host yang dapat terbentuk
network
m = netmask baru – netmask class ip awal
19 – 8 = 11
2^{11} = 2048 network

Host
total bit – netmask baru (32 – 19 = 13)
$2^n – 2 = 2^{13}$ = 8190 host

Sebutkan 5 network pertama dan terakhir

rumus range (256 – 224 = 32)

5 Network Awal

NETWORK
60.0.0.0
60.0.32.0
60.0.64.0
60.0.96.0
60.0.128.0

5 Network Akhir

NETWORK
60.255.224.0
60.255.192.0
60.255.160.0
60.255.128.0
60.255.96.0

Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	60.0.0.0	60.0.0.1	60.0.31.254	60.0.31.255
2	60.0.32.0	60.0.32.1	60.0.63.254	60.0.63.255

3	60.0.64.0	60.0.64.1	60.0.95.254	60.0.95.255
4	60.0.96.0	60.0.96.1	60.0.127.254	60.0.127.255
5	60.0.128.0	60.0.128.1	60.0.159.254	60.0.159.255

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	60.255.224.0	60.255.224.1	60.255.255.254	60.255.255.255
2	60.255.192.0	60.255.192.1	60.255.223.254	60.255.223.255
3	60.255.160.0	60.255.160.1	60.255.191.254	60.255.191.255
4	60.255.128.0	60.255.128.1	60.255.159.254	60.255.159.255
5	60.255.96.0	60.255.96.1	60.255.127.254	60.255.127.255

6. **Diberikan network dengan IP 160.13.0.0/16, dengan kebutuhan network 70**
   sebutkan netmask yang baru
   rumus $2^m >= 70$
   $m = 7 = 2^7$

   netmask class ip saat ini + m
   16 + 7 = 23
   netmask /23 = 255.255.254.0

   berapa network dan host yang dapat terbentuk
   network
   m = netmask baru – netmask class ip awal
   23 – 16 = 7
   $2^7 = 128$ network

   host
   total bit – netmask baru (32 – 23 = 9)
   $2^n – 2 = 2^9 = 510$

- Sebutkan 5 network pertama dan terakhir

  rumus range (256-254 = 2)

  5 Network Awal

NO	NETWORK
1	160.13.0.0
2	160.13.2.0
3	160.13.4.0
4	160.13.6.0

5	160.13.8.0

5 Network Akhir

NO	NETWORK
1	160.13.254.0
2	160.13.252.0
3	160.13.250.0
4	160.13.248.0
5	160.13.246.0

- Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	160.13.0.0	160.13.0.1	160.13.1.254	160.13.1.255
2	160.13.2.0	160.13.2.1	160.13.3.254	160.13.3.255
3	160.13.4.0	160.13.4.1	160.13.5.254	160.13.5.255
4	160.13.6.0	160.13.6.1	160.13.7.254	160.13.7.255
5	160.13.8.0	160.13.8.1	160.13.9.254	160.13.9.255

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	160.13.254.0	160.13.254.1	160.13.255.254	160.13.255.255
2	160.13.252.0	160.13.252.1	160.13.253.254	160.13.253.255
3	160.13.250.0	160.13.250.1	160.13.251.254	160.13.251.255
4	160.13.248.0	160.13.248.1	60.255.249.254	160.13.249.255
5	160.13.246.0	160.13.246.1	160.13.247.254	160.13.247.255

7. Diberikan network dengan IP 120.0.0.0/8 , ada 5 network dengan kebutuhan host 40, 50, 100, 70, 15.

sebutkan netmask yang baru

rumus $2^n - 2$

$2^7 - 2 >= 100$

n = 7

netmask yang baru= 32 – 7

= /25

Subnet mask = 255.255.255.128

- Berapa network dan host yg dapat terbetuk

netmask baru – netmask class ip awal

25 – 8 = 17

Network = 2^7

= 131.072 network

Host

$2^n - 2$

= $2^7 - 2$

= 126 Host

Sebutkan 5 network pertama dan terakhir

Rumus 256 – 128 = 128

5 Network Awal

NO	NETWORK
1	120.0.0.0
2	120.0.0.128
3	120.0.1.0
4	120.0.1.128
5	120.0.2.0

5 Network Akhir

NO	NETWORK
1	120.255.255.128
2	120.255.255.0
3	120.255.254.128
4	120.255.254.0
5	120.255.253.128

Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	120.0.0.0	120.0.0.1	120.0.0.126	120.0.0.127
2	120.0.0.128	120.0.0.129	120.0.0.254	120.0.0.255
3	120.0.1.0	120.0.1.1	120.0.1.126	120.0.1.127
4	120.0.1.128	120.0.1.129	120.0.1.254	120.0.1.255
5	120.0.2.0	120.0.2.1	120.0.2.126	120.0.2.127

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	120.255.255.128	120.255.255.129	120.255.255.254	120.255.255.255
2	120.255.255.0	120.255.255.1	120.255.255.126	120.255.255.127
3	120.255.254.128	120.255.254.129	120.255.254.254	120.255.254.255
4	120.255.254.0	120.255.254.1	120.255.254.126	120.255.254.127

5	120.255.253.128	120.255.253.129	120.255.253.254	120.255.253.255

8. Diberikan network dengan IP 200.40.35.0/24 , ada 5 network dengan kebutuhan host 12

Sebutkan netmask yg baru

2^4 -2 >= 12

n = 4

netmask baru = 32 – 4

= /28

Subnet mask = 255.255.255.240

Berapa network dan host yg dapat terbetuk

Network = 2^4

netmask baru – netmask class ip awal 28-24 = 4

= 16 network

Host

2^n - 2

= 2^4 – 2

= 14 Host

Sebutkan 5 network pertama dan terakhir

5 Network Awal

NO	NETWORK
1	200.40.35.0
2	200.40.35.16
3	200.40.35.32
4	200.40.35.48
5	200.40.35.64

5 Network Akhir

NO	NETWORK
1	200.40.35.240
2	200.40.35.224
3	200.40.35.208
4	200.40.35.192

5	200.40.35.176

Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	200.40.35.0	200.40.35.1	200.40.35.14	200.40.35.15
2	200.40.35.16	200.40.35.17	200.40.35.30	200.40.35.31
3	200.40.35.32	200.40.35.33	200.40.35.46	200.40.35.47
4	200.40.35.48	200.40.35.49	200.40.35.62	200.40.35.63
5	200.40.35.64	200.40.35.65	200.40.35.78	200.40.35.79

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	200.40.35.240	200.40.35.241	200.40.35.254	200.40.35.255
2	200.40.35.224	200.40.35.225	200.40.35.238	200.40.35.239
3	200.40.35.208	200.40.35.209	200.40.35.222	200.40.35.223
4	200.40.35.192	200.40.35.193	200.40.35.206	200.40.35.207
5	200.40.35.176	200.40.35.177	200.40.35.190	200.40.35.191

9. Diberikan network dengan IP 160.130.0.0/16 , dengan kebutuhan network 30

Sebutkan netmask yg baru

$30 <= 2^5$

n = 5

prefix = 16+5

= 21

Subnet mask = 255.255.248.0

a. Berapa network dan host yg dapat terbetuk

Network = 2^5

= 32 network

Host = $2^{32-21} - 2$

= 2046 Host

b. Sebutkan 5 network pertama dan terakhir

5 Network Awal

NO	NETWORK
1	160.130.0.0
2	160.130.8.0
3	160.130.16.0
4	160.130.24.0
5	160.130.32.0

5 Network Akhir

NO	NETWORK
1	160.130.248.0
2	160.130.240.0
3	160.130.232.0
4	160.130.224.0
5	160.130.216.0

c. Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	160.130.0.0	160.130.0.1	160.130.7.254	160.130.7.255
2	160.130.8.0	160.130.8.1	160.130.15.254	160.130.15.255
3	160.130.16.0	160.130.16.1	160.130.23.254	160.130.23.255
4	160.130.24.0	160.130.24.1	160.130.31.254	160.130.31.255
5	160.130.32.0	160.130.32.1	160.130.39.254	160.130.39.255

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	160.130.248.0	160.130.248.1	160.130.255.254	160.130.255.255
2	160.130.240.0	160.130.240.1	160.130.247.254	160.130.247.255
3	160.130.232.0	160.130.232.1	160.130.239.254	160.130.239.255
4	160.130.224.0	160.130.224.1	160.130.231.254	160.130.231.255
5	160.130.216.0	160.130.216.1	160.130.223.254	160.130.223.255

10. Diberikan network dengan IP 110.0.0.0/8 , ada 5 network dengan kebutuhan host 40, 70, 50, 30, 15.

Sebutkan netmask yg baru

$70 <= 2^7 - 2$

n = 7

prefix = 32 – 7

= 25 = 8 + 8 + 8 + 1

255.255.255.128

Berapa network dan host yg dapat terbetuk

Network = 2^{25-8}

= 131.072 network

Host = $2^7 – 2$

= 126 Host

Sebutkan 5 network pertama dan terakhir

5 Network Awal

NO	NETWORK
1	110.0.0.0
2	110.0.0.128
3	110.0.1.0
4	110.0.1.128
5	110.0.2.0

5 Network Akhir

NO	NETWORK
1	110.255.255.128
2	110.255.255.0
3	110.255.254.128
4	110.255.254.0
5	110.255.253.128

Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	110.0.0.0	110.0.0.1	110.0.0.126	110.0.0.127
2	110.0.0.128	110.0.0.129	110.0.0.254	110.0.0.255
3	110.0.1.0	110.0.1.1	110.0.1.126	110.0.1.127
4	110.0.1.128	110.0.1.129	110.0.1.254	110.0.1.255

5	110.0.2.0	110.0.2.1	110.0.2.126	110.0.2.127

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	110.255.255.128	110.255.255.129	110.255.255.254	110.255.255.255
2	110.255.255.0	110.255.255.1	110.255.255.126	110.255.255.127
3	110.255.254.128	110.255.254.129	110.255.254.254	110.255.254.255
4	110.255.254.0	110.255.254.1	110.255.254.126	110.255.254.127
5	110.255.253.128	110.255.253.129	110.255.253.254	110.255.253.255

11. Diberikan IP address 110.112.33.125/ , ada 5 network dengan kebutuhan host 40, 70, 50, 30, 15.

Sebutkan netmask yg baru

$70 <= 2^7 - 2$

n = 7

prefix = 32 – 7

= 25 = 8 + 8 + 8 + 1

255.255.255.128

a. Berapa network dan host yg dapat terbetuk

Network = 2^{25-8}

= 131.072 network

Host = $2^7 – 2$

= 126 Host

Sebutkan 5 network pertama dan terakhir

5 Network Awal

NO	NETWORK
1	110.0.0.0
2	110.0.0.128
3	110.0.1.0
4	110.0.1.128
5	110.0.2.0

5 Network Akhir

NO	NETWORK
1	110.255.255.128
2	110.255.255.0

3	110.255.254.128
4	110.255.254.0
5	110.255.253.128

Sebutkan range host tiap network bersama broadcastnya

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	110.0.0.0	110.0.0.1	110.0.0.126	110.0.0.127
2	110.0.0.128	110.0.0.129	110.0.0.254	110.0.0.255
3	110.0.1.0	110.0.1.1	110.0.1.126	110.0.1.127
4	110.0.1.128	110.0.1.129	110.0.1.254	110.0.1.255
5	110.0.2.0	110.0.2.1	110.0.2.126	110.0.2.127

NO	NETWORK	IP HOST AWAL	IP HOST AKHIR	BROADCAST
1	110.255.255.128	110.255.255.129	110.255.255.254	110.255.255.255
2	110.255.255.0	110.255.255.1	110.255.255.126	110.255.255.127
3	110.255.254.128	110.255.254.129	110.255.254.254	110.255.254.255
4	110.255.254.0	110.255.254.1	110.255.254.126	110.255.254.127
5	110.255.253.128	110.255.253.129	110.255.253.254	110.255.253.255

12. Jika diberikan alamat host 11.43.243.89/20.

Sebutkan network addresnya

/20 = 255.255.240.0

network address 11.43.240.0/20

Sebutkan berapa host dan network maksimum yang bisa dibentuk

Host

konversi class A class B = class C

/20 + 8 = /28

total bit – netmask class baru

32 – 28 = 4

n = 4

$2^n = 2^4 = 16$

16 x 256 = 4096 – 2 = 4094 host

Network

network bit baru (m) = netmask – netmask kelas B = 20-16 =4

Jumlah network = $2^m = 2^4 = 16$

\

Sebutkan range host dan alamat broadcastnya pada network tersebut

Rumus 256 – 240 = 16

11.43.240.1 – 11.43.255.254 – 11.43.255.255

13. Jika diberikan alamat host 130.113.213.89/21.

Sebutkan network addresnya

/21 = 255.255.248.0

network address 130.113.208.0/21

Sebutkan berapa host dan network maksimum yang bisa dibentuk

Host

konversi class A class B = class C

/21 + 8 = /29

total bit – netmask class baru

32 – 29 = 3

n = 3

$2^n = 2^3 = 8$

8 x 256 = 2048– 2 = 2046 host

Network

network bit baru (m) = netmask – netmask kelas B = 21-16 =4

Jumlah network = $2^m = 2^5 = 32$

Sebutkan range host dan alamat broadcastnya pada network tersebut

rumus 256 – 248 = 8

130.113.208.1 – 130.113.215.254 – 130.113.215.255

14. Jika diberikan alamat host 200.78.135.34/28

Sebutkan network addresnya

/28 = 255.255.255.240

32 – 28 = 4 = 2^4 = 16

16 x 2 = 32 range 32 - 47

network address 200.78.135.32/28

Sebutkan berapa host dan network maksimum yang bisa dibentuk

Host

total bit – netmask class

32 – 28 = 4

n = 4

2^n - 2 = 2^4 - 2= 14

Network

network bit baru (m) = netmask – netmask kelas C = 28-24 =4

Jumlah network = 2^m = 2^4 = 16

Sebutkan range host dan alamat broadcastnya pada network tersebut

200.78.135.33 – 200.78.135.46 - 200.78.135.47

15. Jika diberikan alamat host 89.143.250.189/18.

Sebutkan network addresnya

256 – 64 = 192

/18 = 255.255.192.0

64 x 3 = 192

network address 89.143.192.0/18

Sebutkan berapa host dan network maksimum yang bisa dibentuk

Host

konversi class A class B = class C

/18 + 8 = /26

total bit – netmask class baru

32 – 26 = 6

n = 6

$2^n = 2^6 = 64$

64 x 256 = 16384– 2 = 16382 host

Network

network bit baru (m) = netmask – netmask kelas B = 18-16 =4

Jumlah network = $2^m = 2^4 = 16$

Sebutkan range host dan alamat broadcastnya pada network tersebut

89.143.192.1 – 89.143.255.254 - 89.143.255.255

16. Jika diberikan alamat host 130.243.250.167/28.

Sebutkan network addresnya

/28 = 255.255.255.240

32 – 28 = 4 = $2^4 = 16$

16 x 10 = 160 range 160 - 175

network address 130.243.250.160/28

Sebutkan berapa host dan network maksimum yang bisa dibentuk

Host

total bit – netmask class

32 – 28 = 4

n = 4

$2^n - 2 = 2^4 - 2 = 14$

Network

network bit baru (m) = netmask – netmask kelas C = 28-24 =4

Jumlah network = $2^m = 2^4 = 16$

Sebutkan range host dan alamat broadcastnya pada network tersebut

130.243.250.161 – 130.243.250.174 – 130.243.250.175