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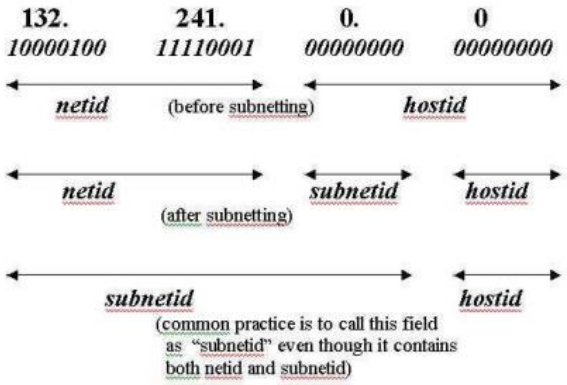
Weekly Log

Chapter 6: Network Layer

1. Static Subnetting
    a. Bagian dari host address dipakai untuk subnetwork address bits.
    b. Garis pembagi antara bagian network address dan host address di geser ke kanan.



- Given network of 204.17.5.0/24. Create two network subnet:

Before subnetting:
204.17.5.0 11001100.00010001.00000101.00000000
255.255.255.0 11111111.11111111.11111111.00000000

After subnetting with **two subnet**
204.17.5.0 11001100.00010001.00000101.0**0000000**
255.255.255.128 11111111.11111111.11111111.1**0000000**

204.17.5.128 11001100.00010001.00000101.1**0000000**
255.255.255.128 11111111.11111111.11111111.1**0000000**

- Before Subnetting (204.17.5.0/24)

Network Address (NA)	4th Octet of NA (in binary)	Subnet Mask	First Host	Last Host
204.17.5.0	x.x.x.00000000	255.255.255.0	204.17.5.1	204.17.5.254

- After Subnetting (two subnets)

Network Address (NA)	4th Octet of NA (in binary)	Subnet Mask	First Host	Last Host
204.17.5.0	x.x.x.0**0000000**	255.255.255.128	204.17.5.1	204.17.5.126
204.17.5.128	x.x.x.1**0000000**	255.255.255.128	204.17.5.129	204.17.5.254

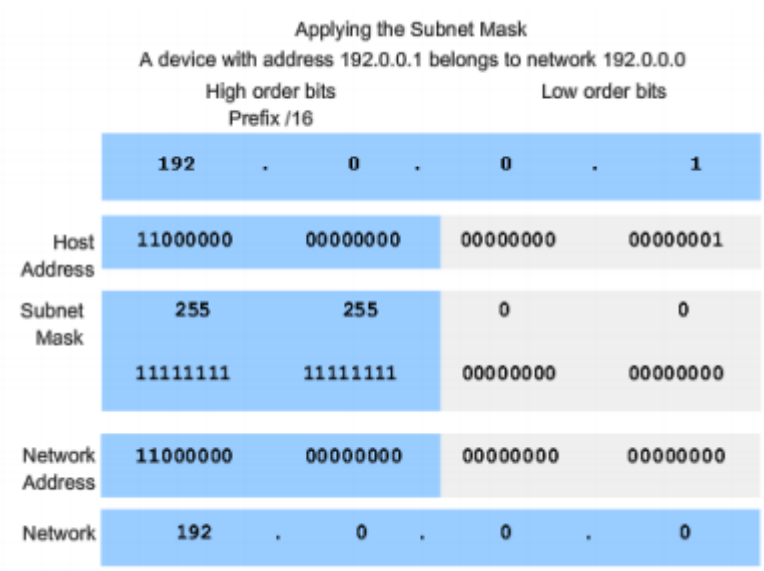
- Before Subnetting (204.17.5.0/24)

Network Address (NA)	Total Host (2^n-2)	First Host	Last Host	Broadcast
204.17.5.0/24	254	204.17.5.1	204.17.5.254	204.17.5.255

- After Subnetting (two subnets)

Network Address (NA)	Total Host (2^n-2)	First Host	Last Host	Broadcast
204.17.5.0	126	204.17.5.1	204.17.5.126	204.17.5.127
204.17.5.128	126	204.17.5.129	204.17.5.254	204.17.5.255

2. Subnet Mask
    a. Subnet didefinisikan dengan mengaplikasikan subnet mask ke ip address
    b. Standar subnet mask untuk 3 kelas addresses
        1. Class A address – 255.0.0.0
        2. Class B address – 255.255.0.0
        3. Class C address – 255.255.255.0



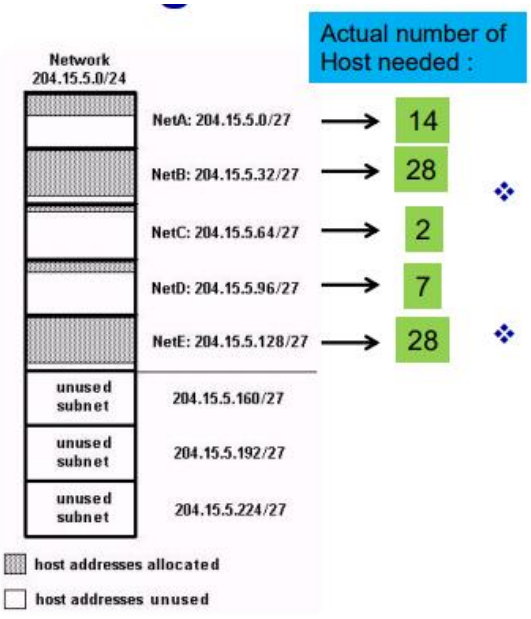
Given network address = 204.17.5.0/24, create 8 subnet!

Network Address (NA)	4th Octet of NA (in binary)	Subnet Mask	First Host	Last Host
204.17.5.0	x.x.x.00000000	255.255.255.224	x.x.x.1	x.x.x.30
204.17.5.32	x.x.x.00100000	255.255.255.224	x.x.x.33	x.x.x.62
204.17.5.64	x.x.x.01000000	255.255.255.224	x.x.x.65	x.x.x.94
204.17.5.96	x.x.x.01100000	255.255.255.224	x.x.x.97	x.x.x.126
204.17.5.128	x.x.x.10000000	255.255.255.224	x.x.x.129	x.x.x.158
204.17.5.160	x.x.x.10100000	255.255.255.224	x.x.x.161	x.x.x.190
204.17.5.192	x.x.x.11000000	255.255.255.224	x.x.x.193	x.x.x.222
204.17.5.224	x.x.x.11100000	255.255.255.224	x.x.x.225	x.x.x.254

x.x.x = 204.17.5

Total Host = $2^n - 2 = 2^5-2=30$ Host
n = total bit for host id
Total Subnet = $2^m = 2^3 = 8$ Subnet
m = total bit for network id

3. Variable Length Subnet Mask (VLSM)
   a. Membuat kita bisa menggunakan mask berbeda untuk setiap subnet sehingga alokasi address bisa efisien.



netA: requires a /28 (255.255.255.240) mask to support 14 hosts
netB: requires a /27 (255.255.255.224) mask to support 28 hosts
netC: requires a /30 (255.255.255.252) mask to support 2 hosts
netD*: requires a /28 (255.255.255.240) mask to support 7 hosts
netE: requires a /27 (255.255.255.224) mask to support 28 hosts

* a /29 (255.255.255.248) would only allow 6 usable host addresses, therefore netD requires a /28 mask.

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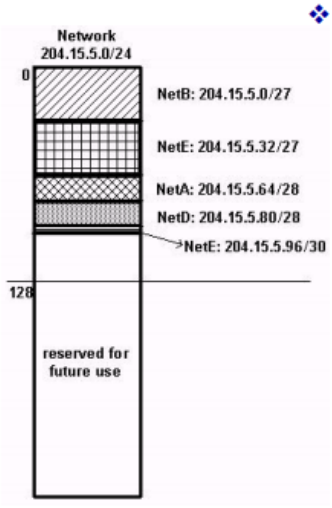

- The easiest way to assign the subnets is to assign the largest first. For example, you can assign in this manner:

netB: 204.15.5.0/27 host address range 1 to 30

netE: 204.15.5.32/27 host address range 33 to 62

netA: 204.15.5.64/28 host address range 65 to 78

netD: 204.15.5.80/28 host address range 81 to 94

netC: 204.15.5.96/30 host address range 97 to 98