

Subnetting contd

- Private cidrs

```
192.168.0.0/16
172.16.0.0/12
10.0.0.0/8
```

Problem 1

- I need a network for 1000 devices
- This network will have two subnets with 500 devices each
- Network

```
Size = 1000
2^n - 2 ~ = 1000
n = 10
N = 22
ip: 192.168.0.0/22
SM: 11111111.11111111.11111100.00000000
```

- Subnet (2)

```
Size = 500
2^n-2 ~ = 500
n = 9
N = 23

nip: 192.168.0.0/22
nsm: 11111111.11111111.11111100.00000000
ssm: 11111111.11111111.111111*0.00000000
ip:          192.168.000000*x.xxxxxxxx
s1ip:        192.168.000000x.xxxxxxxx => 192.168.0.0/23
s2ip:        192.168.0000001x.xxxxxxxx => 192.168.2.0/23
```

Problem 2

- I need a network for 200 devices
- This network will have two subnets with 100 devices each
- Network

```
2^n-2 ~ = 200
n = 8
```

```
N = 24
ip: 10.100.101.0/24
```

- Subnet

```
2^n - 2 ~ 100
n = 7
N = 25

nip: 10.100.101.0/24
nsm: 11111111.11111111.11111111.00000000
ssm: 11111111.11111111.11111111.*00000000
ip:          10.100.101.*xxxxxxx/25
s1ip:       10.100.101.0xxxxxxx/25 = 10.100.101.0/25
s2ip:       10.100.101.1xxxxxxx/25 = 10.100.101.128/25
```

Problem 3

- I need a network for 2000 devices
- This network will have four subnets with 500 devices each
- Network

```
2^n ~ 2000
n = 11
N = 21

172.30.0.0/21
```

- Subnet

```
2^n ~ 500
n = 9
N = 23

nip: 172.30.0.0/21
nsm: 11111111.11111111.11111000.00000000
ssm: 11111111.11111111.11111**0.00000000
s1ip: 172.30.0000000x.xxxxxxxx/23 = 172.30.0.0/23
s2ip: 172.30.0000001x.xxxxxxxx/23 = 172.30.2.0/23
s3ip: 172.30.0000010x.xxxxxxxx/23 = 172.30.4.0/23
s4ip: 172.30.0000011x.xxxxxxxx/23 = 172.30.6.0/23
```

Problem 4

- I need a network for 400 devices
- This network will have four subnets with 100 devices each

- Network

```
2^n ~= 400
n = 9
N = 23

ip: 192.168.0.0/23
```

- Subnet (4):

```
2^n ~= 100
n = 7
N = 25

nip: 192.168.0.0/23
nsm: 11111111.11111111.11111110.00000000
ssm: 11111111.11111111.1111111*. *0000000
sip :      192.168.0000000*. *xxxxxxx/25
s1ip:      192.168.00000000.0xxxxxxx/25 = 192.168.0.0/25
s2ip:      192.168.00000000.1xxxxxxx/25 = 192.168.0.128/25
s3ip:      192.168.00000001.0xxxxxxx/25 = 192.168.1.0/25
s4ip:      192.168.00000001.1xxxxxxx/25 = 192.168.1.128/25
```

Problem 5

- I need a network for 1000 devices
- This network will have four subnets with 250 devices each

```
network: 10.0.0.0/22
s1: 10.0.0.0/24
s2: 10.0.1.0/24
s3: 10.0.2.0/24
s4: 10.0.3.0/24
```

Problem 6

- I need a network for 8000 devices
- This network will have eight subnets with 1000 devices each
- Network

```
2^n ~= 8000
n = 13
N = 32 - 13 = 19
```

```
ip: 192.168.0.0/19
```

- Subnets(8)

```
2^n ≈ 1000
```

```
n = 10
```

```
N = 22
```

```
nip: 192.168.0.0/19
```

```
nsm: 11111111.11111111.11100000.00000000
```

```
ssm: 11111111.11111111.11111100.00000000
```

```
sip: 192.168.000***xx.xxxxxxxx/22
```

```
s1ip: 192.168.000000xx.xxxxxxxx/22 = 192.168.0.0/22
```

```
s2ip: 192.168.000001xx.xxxxxxxx/22 = 192.168.4.0/22
```

```
s3ip: 192.168.000010xx.xxxxxxxx/22 = 192.168.8.0/22
```

```
s4ip: 192.168.000011xx.xxxxxxxx/22 = 192.168.12.0/22
```

```
s5ip: 192.168.000100xx.xxxxxxxx/22 = 192.168.16.0/22
```

```
s6ip: 192.168.000101xx.xxxxxxxx/22 = 192.168.20.0/22
```

```
s7ip: 192.168.000110xx.xxxxxxxx/22 = 192.168.24.0/22
```

```
s8ip: 192.168.000111xx.xxxxxxxx/22 = 192.168.28.0/22
```

Problem 7

- I want a network of 800 devices with 8 subnets of 100 each
- Network

```
2^n ≈ 800
```

```
n = 10
```

```
N = 22
```

```
ip: 172.16.0.0/22
```

- Subnets (8)

```
2^n ≈ 100
```

```
n = 7
```

```
N = 25
```

```
nip: 172.16.0.0/22
```

```
nsm: 11111111.11111111.11111100.00000000
```

```
ssm: 11111111.11111111.11111111.10000000
```

```
sip: 172.16.000000**.*xxxxxxx/25
```

```
s1ip: 172.16.00000000.0xxxxxxx/25 = 172.16.0.0/25
```

```
s2ip: 172.16.00000000.1xxxxxxx/25 = 172.16.0.128/25
```

```
s3ip: 172.16.00000001.0xxxxxxx/25 = 172.16.1.0/25
```

```
s4ip: 172.16.000000**.*xxxxxxx/25 = 172.16.1.128/25
```

```
s5ip: 172.16.000000**.*xxxxxxx/25 = 172.16.2.0/25
```

```
s6ip:      172.16.000000**. *xxxxxxx/25 = 172.16.2.128/25
s7ip:      172.16.000000**. *xxxxxxx/25 = 172.16.3.0/25
s8ip:      172.16.000000**. *xxxxxxx/25 = 172.16.3.128/25
```

Principle 3

- We can establish connections between private networks only when the network ranges of them do not collide