## Day 14 Subnetting: Part 2

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## Class C Networks

Class C networks are commonly used for smaller networks, as they allow up to 256 IP addresses, including the network and broadcast addresses. Subnetting a Class C network divides these 256 addresses into smaller groups.

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### Subnetting Table for Class C Networks

| CIDR | Subnet Mask | Total Addresses | Usable Hosts | Group Size |
|---|---|---|---|---|
| /25 | 255.255.255.128 | 128 | 126 | 128 |
| /26 | 255.255.255.192 | 64 | 62 | 64 |
| /27 | 255.255.255.224 | 32 | 30 | 32 |
| /28 | 255.255.255.240 | 16 | 14 | 16 |
| /29 | 255.255.255.248 | 8 | 6 | 8 |
| /30 | 255.255.255.252 | 4 | 2 | 4 |
| /31* | 255.255.255.254 | 2 | 0 (Point-to-Point) | 2 |

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### Examples for Class C

1. **Subnetting `192.168.1.0/26`:**
    - **Subnet Mask:** 255.255.255.192
    - **Group Size:** 256 − 192= 64
    - **Subnets:**
        - `192.168.1.0` to `192.168.1.63`.
        - `192.168.1.64` to `192.168.1.127`.
        - `192.168.1.128` to `192.168.1.191`.
        - `192.168.1.192` to `192.168.1.255`.

- **Usable Hosts per Subnet:** 64−2=62

**2. Subnetting `192.168.1.0/28`:**

- **Subnet Mask:** 255.255.255.240
- **Group Size:** 256−240=16
- **Subnets:**
  - `192.168.1.0` to `192.168.1.15`.
  - `192.168.1.16` to `192.168.1.31`, and so on.
- **Usable Hosts per Subnet:** 16−2=14

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## Class B Networks

Class B networks are used for medium-to-large organizations. They provide up to 65,536 addresses, making them suitable for larger networks. Subnetting a Class B network divides this large address space into smaller, manageable blocks.

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**Subnetting Table for Class B Networks**

| CIDR | Subnet Mask | Total Addresses | Usable Hosts | Group Size |
|---|---|---|---|---|
| /16 | 255.255.0.0 | 65,536 | 65,534 | 65,536 |
| /17 | 255.255.128.0 | 32,768 | 32,766 | 32,768 |
| /18 | 255.255.192.0 | 16,384 | 16,382 | 16,384 |
| /19 | 255.255.224.0 | 8,192 | 8,190 | 8,192 |
| /20 | 255.255.240.0 | 4,096 | 4,094 | 4,096 |
| /21 | 255.255.248.0 | 2,048 | 2,046 | 2,048 |
| /22 | 255.255.252.0 | 1,024 | 1,022 | 1,024 |
| /23 | 255.255.254.0 | 512 | 510 | 512 |
| /24 | 255.255.255.0 | 256 | 254 | 256 |

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**Examples for Class B**

1. **Subnetting `172.16.0.0/20`:**
    - **Subnet Mask:** 255.255.240.0.
    - **Group Size:** 256−240=16 in the third octet.
    - **Subnets:**
        - `172.16.0.0` to `172.16.15.255`.
        - `172.16.16.0` to `172.16.31.255`, and so on.
    - **Usable Hosts per Subnet:** 4,096−2=4,094

2. **Subnetting `172.16.0.0/18`:**

    - **Subnet Mask:** 255.255.192.0.
    - **Group Size:** 256−192=64 in the third octet.
    - **Subnets:**
        - `172.16.0.0` to `172.16.63.255`.
        - `172.16.64.0` to `172.16.127.255`, and so on.
    - **Usable Hosts per Subnet:** 16,384−2=16,382

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## Tips for Subnetting

1. Use the **CIDR Prefix** to determine the subnet mask and group size.
2. Calculate the **block range** (group size) to determine the network and broadcast addresses.
3. Subtract **2 addresses** for the network and broadcast from the total block size to get usable addresses.
4. Visualize the address ranges in terms of groups (e.g., 0–63, 64–127) for faster calculations.