

## Variable Length Subnet Table For IPv4

### Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

### Abstract

This document itemizes the potential values for IPv4 subnets. Additional information is provided for Hex and Decmial values, classfull equivalents, and number of addresses available within the indicated block. We appreciate inputs from Bruce Pinsky (cisco) and Daniel Karrenberg (RIPE).

### Table

The following table lists the variable length subnets from 1 to 32, the CIDR representation form and the Decmial equivalents.

Mask value:

| Hex         | CIDR | Decimal       | #of add | Classfull |
|-------------|------|---------------|---------|-----------|
| 80.00.00.00 | /1   | 128.0.0.0     | 2048 M  | 128 A     |
| C0.00.00.00 | /2   | 192.0.0.0     | 1024 M  | 64 A      |
| E0.00.00.00 | /3   | 224.0.0.0     | 512 M   | 32 A      |
| F0.00.00.00 | /4   | 240.0.0.0     | 256 M   | 16 A      |
| F8.00.00.00 | /5   | 248.0.0.0     | 128 M   | 8 A       |
| FC.00.00.00 | /6   | 252.0.0.0     | 64 M    | 4 A       |
| FE.00.00.00 | /7   | 254.0.0.0     | 32 M    | 2 A       |
| FF.00.00.00 | /8   | 255.0.0.0     | 16 M    | 1 A       |
| FF.80.00.00 | /9   | 255.128.0.0   | 8 M     | 128 B     |
| FF.C0.00.00 | /10  | 255.192.0.0   | 4 M     | 64 B      |
| FF.E0.00.00 | /11  | 255.224.0.0   | 2 M     | 32 B      |
| FF.F0.00.00 | /12  | 255.240.0.0   | 1024 K  | 16 B      |
| FF.F8.00.00 | /13  | 255.248.0.0   | 512 K   | 8 B       |
| FF.FC.00.00 | /14  | 255.252.0.0   | 256 K   | 4 B       |
| FF.FE.00.00 | /15  | 255.254.0.0   | 128 K   | 2 B       |
| FF.FF.00.00 | /16  | 255.255.0.0   | 64 K    | 1 B       |
| FF.FF.80.00 | /17  | 255.255.128.0 | 32 K    | 128 C     |
| FF.FF.C0.00 | /18  | 255.255.192.0 | 16 K    | 64 C      |

|             |     |                 |                             |      |
|-------------|-----|-----------------|-----------------------------|------|
| FF.FF.E0.00 | /19 | 255.255.224.0   | 8 K                         | 32 C |
| FF.FF.F0.00 | /20 | 255.255.240.0   | 4 K                         | 16 C |
| FF.FF.F8.00 | /21 | 255.255.248.0   | 2 K                         | 8 C  |
| FF.FF.FC.00 | /22 | 255.255.252.0   | 1 K                         | 4 C  |
| FF.FF.FE.00 | /23 | 255.255.254.0   | 512                         | 2 C  |
| FF.FF.FF.00 | /24 | 255.255.255.0   | 256                         | 1 C  |
| FF.FF.FF.80 | /25 | 255.255.255.128 | 128                         |      |
| FF.FF.FF.C0 | /26 | 255.255.255.192 | 64                          |      |
| FF.FF.FF.E0 | /27 | 255.255.255.224 | 32                          |      |
| FF.FF.FF.F0 | /28 | 255.255.255.240 | 16                          |      |
| FF.FF.FF.F8 | /29 | 255.255.255.248 | 8                           |      |
| FF.FF.FF.FC | /30 | 255.255.255.252 | 4                           |      |
| FF.FF.FF.FE | /31 | 255.255.255.254 | This space is not usable    |      |
| FF.FF.FF.FF | /32 | 255.255.255.255 | This is a single host route |      |

### Examples

The following tables illustrate some options for subnet/host partitions within selected block sizes.

From a /16 block

| # bits | Mask            | Effective Subnets | Effective Hosts |
|--------|-----------------|-------------------|-----------------|
| =====  | =====           | =====             | =====           |
| 2      | 255.255.192.0   | 2                 | 16382           |
| 3      | 255.255.224.0   | 6                 | 8190            |
| 4      | 255.255.240.0   | 14                | 4094            |
| 5      | 255.255.248.0   | 30                | 2046            |
| 6      | 255.255.252.0   | 62                | 1022            |
| 7      | 255.255.254.0   | 126               | 510             |
| 8      | 255.255.255.0   | 254               | 254             |
| 9      | 255.255.255.128 | 510               | 126             |
| 10     | 255.255.255.192 | 1022              | 62              |
| 11     | 255.255.255.224 | 2046              | 30              |
| 12     | 255.255.255.240 | 4094              | 14              |
| 13     | 255.255.255.248 | 8190              | 6               |
| 14     | 255.255.255.252 | 16382             | 2               |

From a /24 block

| # bits<br>===== | Mask<br>=====   | Effective Subnets<br>===== | Effective Hosts<br>===== |
|-----------------|-----------------|----------------------------|--------------------------|
| 2               | 255.255.255.192 | 2                          | 62                       |
| 3               | 255.255.255.224 | 6                          | 30                       |
| 4               | 255.255.255.240 | 14                         | 14                       |
| 5               | 255.255.255.248 | 30                         | 6                        |
| 6               | 255.255.255.252 | 62                         | 2                        |

\*Subnet all zeroes and all ones excluded.

\*Host all zeroes and all ones excluded.

## References

- [1] Fuller, V., Li, T., Yu, J., and K. Varadhan, "Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy", RFC 1519, BARRNet, cicso, Merit, OARnet, September 1993.

## Security Considerations

Security issues are not discussed in this memo.

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