IPv4 Subnets Calculations

(1)

Host IP = 192.168.200.139
Original Sub. Mask = 255.255.255.0 (/24)
New Sub. Mask = 255.255.255.224 (/27)

No. of subnet bits = 27 - 24 = 3
No. of subnets = 2^3 = 8
No. of Host Bits = 32 - 27 = 5
No. of Hosts = $2^5 - 2$ = 30 per subnet
Net. addr = ?

192.168.200.139 /27
Magic no = 2^5 = 32

Since 139 / 32 = 4.34
Bits in 4th oct = 4 x 32 = 128

∴ Net. addr = 192.168.200.128 /27
1st Host = 192.168.200.129
Last Host = 192.168.200.158
Broadcast = 192.168.200.159

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(2)

Host IP = 10.101.99.228
Original Sub. Mask = 255.0.0.0 (/8)
New Sub. Mask = 255.255.128.0 (/17)

No. of Subnet Bits = 17 - 16 = 1
No. of Subnets = 2^1 = 2
No. of Host Bits = 24 - 17 = 7
No. of Hosts = $2^7 - 2$ = 126 per subnet
Net. addr = ?

10.101.99.228 / 17
Magic no. = 2^7 = 128
Since 99 / 128 = 0

∴ Net. addr = 10.101.0.0
1st Host = 10.101.0.1
Last Host = 10.101.127.254
Broadcast = 10.101.127.255

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(3)

Host IP = 172.22.32.12
Original Sub. Mask = 255.255.0.0 (/16)

New Sub. Mask = 255.255.224.0 (/19)

No. of Subnet Bits = 19-16 = 3
No. of Subnets = $2^3 = 8$
No. of Host Bits = 24 - 19 = 5 per subnet
No. of Hosts = $2^5 - 2 = 30$ per subnet
Net. addr = ?

172.22.32.12 / 19
Magic. no = $2^5 = 32$
Since 32 / 32 = 1

Net. addr = 172.22.32.0
1st. host = 172.22.32.1
Last host = 172.22.63.254
Broadcast = 172.22.63.255

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(4)

Host IP = 192.168.1.245
Original Sub. Mask = 255.255.255.0 (/24)
New Sub. Mask = 255.255.255.252 (/30)

No. of Subnet Bits = 30 - 24 = 6
No. of Subnets = $2^6 = 64$
No. of Host Bits = 32 - 30 = 2
No. of Hosts = $2^2 - 2 = 2$ per subnet
Net. addr = ?

192.168.1.245 /30
Magic no = $2^2 = 4$
Since 245 / 4 = 61.25
Bits in 4th octet = 61 x 4 = 244

Net. addr = 192.168.1.244
1st host = 192.168.1.245
Last host = 192.168.1.246
Broadcast = 192.168.1.247

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(5)

Host IP = 128.107.0.55
Original Sub. Mask = 255.255.0.0 (/16)
New Sub. Mask = 255.255.255.0 (/24)

No. of Subnet Bits = 24 - 16 = 8
No. of Subnets = $2^8 = 256$
No. of Host Bits = 32 - 24 = 8

No. of Hosts = $2^8 - 2 = 254$ per subnet
Net. addr = ?

128.107.0.55 / 24
Magic no. = $2^8 = 256$
Since 55 / 256 = 0

Net. addr = 128.107.0.0
1st Host = 128.107.0.1
Last Host = 128.107.0.254
Broadcast = 128.107.0.255

Host IP = 192.135.250.180
Original Sub. Mask = 255.255.255.0 (/24)
New Sub. Mask = 255.255.255.248 (/29)

(6)

No. of Subnet Bits = 29 - 24 = 5
No. of Subnets = $2^5 = 32$
No. of Host Bits = 32 - 29 = 3
No. of Hosts = $2^3 - 2 = 6$ per subnet

Net. addr = ?
192.135.250.180 /29
Magic. no = $2^3 = 8$
Since 180 / 8 = 22.5
Bits in 4th octet = 8 x 22 = 176

Net. addr = 192.135.250.176
1st host = 192.135.250.177
last host = 192.135.250.182
Broadcast = 192.135.250.183
