## SUBNET MASK AND RANGE CALCULATION EXERCISE for MIS 4477

## By Jake Messinger

An Internet Provider has control of the class B address space 129.7.0.0/16. The address range needs to be broken down into smaller subnets for several different customers. Listed below are the first 10 clients and their immediate needs.

Compute the netmask (slash, binary and decimal) based on the needs, accounting for a $25 \%$ growth in the needs that are given. Do not waste a whole class $C$ on
small clients or you will be penalized. Allocate space and fill in the Network Map as you go, showing the ranges you designate for each customer. Write down the
Network number (address), the broadcast address, and the range of IP's for devices in each subnet. Fill in each route in the routing table as you go.

Map of Class B 129.7.0.0/16 (broken down into chunks of 16 for readability) Use this map to show the address allocation. Write the company name in the block(s) and shade where you need to in order to make it obvious who gets what addresses.

| /24 subnet | 0-15 | 16-31 | 32-47 | 48-63 | 64-79 | 80-95 | 96-111 | $\begin{aligned} & 112- \\ & 127 \end{aligned}$ | $\begin{gathered} 128- \\ 143 \end{gathered}$ | $\begin{aligned} & 144- \\ & 159 \end{aligned}$ | $\begin{aligned} & 160- \\ & 175 \end{aligned}$ | $\begin{gathered} 176- \\ 191 \end{gathered}$ | $\begin{aligned} & 192- \\ & 207 \end{aligned}$ | $\begin{aligned} & 208- \\ & 223 \end{aligned}$ | $\begin{aligned} & 224- \\ & 239 \end{aligned}$ | $\begin{aligned} & 240- \\ & 255 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 129.7.0.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.1.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.2.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.3.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.4.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.5.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.6.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.7.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.8.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.9.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.10.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.11.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.12.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.13.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.14.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.15.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.16.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.17.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.18.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.19.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.20.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 129.7.21.0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. Myspacebook.com (needs 480 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal: $\qquad$
d. Network Address WITH slash notation: $\qquad$ .-1. $\qquad$
e. Broadcast Address: $\qquad$ . .
f. Router Address: $\qquad$
g. Range for PC's and Devices: $\qquad$ to $\qquad$
Show your computations:
2. Adjecta Technologies (needs 50 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal: $\qquad$
d. Network Address WITH slash notation: $\qquad$ .-1.1 $\qquad$
e. Broadcast Address: $\qquad$ --___
f. Router Address:
g. Range for PC's and Devices: $\qquad$ . $\qquad$ to $\qquad$
Show your computations:
3. Japaneiros (needs 5 addresses)
a. Projected Needs:
b. Netmask in Binary: $\qquad$
c. Netmask in Decimal:
d. Network Address WITH slash notation: $\qquad$ .$+. \quad . \quad 1$
e. Broadcast Address: $\qquad$ - _. --
f. Router Address: $\qquad$ ———— . to $\qquad$
Show your computations:
4. Cougar Town (needs 120 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal: $\qquad$
d. Network Address WITH slash notation: $\qquad$ ._-_._._1_
e. Broadcast Address: $\qquad$ . .
f. Router Address: $\qquad$
g. Range for PC's and Devices: $\qquad$ to $\qquad$
Show your computations:
5. GoMommy: (needs 12 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal:
$\qquad$
$\qquad$ . $\qquad$
d. Network Address WITH slash notation: $\qquad$ $.1 .+.1$.
e. Broadcast Address: $\qquad$ -- _.
f. Router Address: $\qquad$ - $\qquad$ to $\qquad$
Show your computations:
6. Spambot USA (Needs 45 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal:
$\qquad$ .
d. Network Address WITH slash notation: $\qquad$ ..$+ \quad 1$
e. Broadcast Address: $\qquad$ ---
f. Router Address: $\qquad$ .___
g. Range for PC's and Devices: $\qquad$
$\qquad$ to $\qquad$
Show your computations:
7. TinyCo, Inc (Needs 3 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal: $\qquad$
d. Network Address WITH slash notation: $\qquad$ . -

e. Broadcast Address: $\qquad$ . ._-_
f. Router Address: $\qquad$
g. Range for PC's and Devices: $\qquad$ to $\qquad$
Show your computations:
8. Abra Cadabra Magic (Needs 27 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal: $\qquad$
$\qquad$ . $\qquad$
d. Network Address WITH slash notation: $\qquad$ $.1 .+.1$.
e. Broadcast Address: $\qquad$ -- ———
f. Router Address: $\qquad$ $\square$. $\qquad$ to $\qquad$
Show your computations:
9. Nothingbut.Net (Needs 200 addresses)
a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal:
$\qquad$ .
d. Network Address WITH slash notation: $\qquad$ ..$+ \quad 1$
e. Broadcast Address: $\qquad$ . -
f. Router Address: $\qquad$ ——— $\qquad$ to $\qquad$
Show your computations:

## 10. 2tothe8th Power Company (Needs 256 addresses)

a. Projected Needs:
b. Netmask in Binary:
$\qquad$
c. Netmask in Decimal:
$\qquad$ . $\qquad$ . . $\qquad$
d. Network Address WITH slash notation: $\qquad$ . $\qquad$ . 1 $\qquad$
e. Broadcast Address: $\qquad$ .-.. $\qquad$ .
f. Router Address: $\qquad$ .
g. Range for PC's and Devices: $\qquad$
$\qquad$ to $\qquad$ . . $\qquad$
Show your computations:

Fill in the Network number, Router, Broadcast address, and the netmask.

| Company | Projected <br> Needs | Netmask in Decimal | Network Address WITH slash notation | Broadcast Address | Router Address |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Myspacebook.com |  |  |  |  |  |
| Adjecta Technologies |  |  |  |  |  |
| Japaneiros |  |  |  |  |  |
| Cougar Town |  |  |  |  |  |
| GoMommy |  |  |  |  |  |
| Spambot USA |  |  |  |  |  |
| TinyCo, Inc |  |  |  |  |  |
| Abra Cadabra Magic |  |  |  |  |  |
| Nothingbut.Net |  |  |  |  |  |
| 2tothe8th Power Company |  |  |  |  |  |

