

[illegible]

| /8                            | /9                             | /10                            | /11                            | /12                            | /13                          | /14                          | /15                          |         |         |         |       |
|-------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|---------|---------|---------|-------|
| 255.0.0.0<br>16,777,216 Hosts | 255.128.0.0<br>8,388,608 Hosts | 255.192.0.0<br>4,194,304 Hosts | 255.224.0.0<br>2,097,152 Hosts | 255.240.0.0<br>1,048,576 Hosts | 255.248.0.0<br>524,288 Hosts | 255.252.0.0<br>262,144 Hosts | 255.254.0.0<br>131,072 Hosts |         |         |         |       |
| 0 - 255                       | 0-127                          | 0-63                           | 0-31                           | 0-15                           | 0-7                          | 0-3                          | 0-1                          |         |         |         |       |
|                               |                                |                                |                                |                                | 8-15                         | 4-7                          | 2-3                          |         |         |         |       |
|                               |                                |                                |                                | 16-31                          | 16-23                        | 8-11                         | 0-7                          |         |         |         |       |
|                               |                                |                                |                                |                                | 20-23                        | 12-15                        | 1-8                          |         |         |         |       |
|                               |                                |                                |                                |                                | 24-31                        | 16-19                        | 10-11                        |         |         |         |       |
|                               |                                |                                |                                |                                | 28-31                        | 20-23                        | 14-15                        |         |         |         |       |
|                               |                                |                                | 32-63                          |                                | 32-39                        | 24-27                        | 16-17                        |         |         |         |       |
|                               |                                |                                |                                |                                | 40-47                        | 28-31                        | 18-19                        |         |         |         |       |
|                               |                                |                                |                                | 48-63                          | 48-55                        | 32-35                        | 20-21                        |         |         |         |       |
|                               |                                |                                |                                |                                | 52-55                        | 36-39                        | 22-23                        |         |         |         |       |
|                               |                                |                                |                                |                                | 56-63                        | 40-43                        | 24-25                        |         |         |         |       |
|                               |                                |                                |                                |                                | 60-63                        | 44-47                        | 26-27                        |         |         |         |       |
|                               |                                | 64-127                         | 64-95                          |                                | 64-79                        | 64-67                        | 48-51                        | 28-29   |         |         |       |
|                               |                                |                                |                                |                                |                              | 72-79                        | 52-55                        | 30-31   |         |         |       |
|                               |                                |                                |                                | 80-95                          | 80-87                        | 56-59                        | 32-33                        |         |         |         |       |
|                               |                                |                                |                                |                                | 88-95                        | 60-63                        | 34-35                        |         |         |         |       |
|                               |                                |                                |                                |                                | 96-111                       | 96-103                       | 100-103                      | 64-67   | 36-37   |         |       |
|                               |                                |                                |                                |                                |                              |                              | 104-111                      | 68-71   | 38-39   |         |       |
|                               |                                |                                | 112-127                        | 112-119                        |                              | 112-115                      | 72-75                        | 40-41   |         |         |       |
|                               |                                |                                |                                |                                |                              | 116-119                      | 76-79                        | 42-43   |         |         |       |
|                               |                                |                                |                                | 120-127                        |                              | 120-123                      | 80-83                        | 44-45   |         |         |       |
|                               |                                |                                |                                |                                |                              | 124-127                      | 84-87                        | 46-47   |         |         |       |
|                               |                                |                                |                                | 128-255                        | 128-191                      | 128-159                      | 128-143                      | 128-135 | 88-91   | 48-49   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 136-143 | 92-95   | 50-51   |       |
|                               |                                | 144-159                        | 144-151                        |                                |                              |                              |                              | 96-99   | 52-53   |         |       |
|                               |                                |                                | 152-159                        |                                |                              |                              |                              | 100-103 | 54-55   |         |       |
|                               |                                |                                | 160-191                        |                                |                              |                              | 160-175                      | 160-163 | 104-107 | 56-57   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 164-167 | 108-111 | 58-59   |       |
|                               |                                | 176-191                        |                                |                                |                              |                              |                              | 176-173 | 112-115 | 60-61   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 180-183 | 116-119 | 62-63   |       |
|                               |                                |                                |                                |                                |                              | 192-255                      | 192-223                      | 192-207 | 192-195 | 120-123 | 64-65 |
|                               |                                |                                |                                |                                |                              |                              |                              |         | 200-207 | 124-127 | 66-67 |
|                               |                                | 208-223                        |                                |                                |                              |                              |                              | 208-215 | 208-211 | 128-131 | 68-69 |
|                               |                                |                                |                                |                                |                              |                              |                              |         | 216-223 | 132-135 | 70-71 |
|                               |                                |                                | 224-255                        |                                |                              |                              |                              | 224-239 | 224-227 | 136-139 | 72-73 |
|                               |                                |                                |                                |                                |                              |                              |                              |         | 232-239 | 140-143 | 74-75 |
|                               |                                | 240-255                        |                                |                                |                              |                              | 240-247                      |         | 144-147 | 76-77   |       |
|                               |                                |                                |                                |                                |                              |                              | 248-251                      | 148-151 | 78-79   |         |       |
|                               |                                |                                |                                |                                |                              |                              | 252-255                      | 152-155 | 80-81   |         |       |
|                               |                                | 128-255                        |                                |                                |                              |                              | 128-191                      | 128-159 | 128-143 | 128-135 | 96-99 |
|                               | 136-143                        |                                | 100-103                        |                                |                              |                              |                              |         |         | 62-63   |       |
|                               | 144-159                        |                                | 144-151                        |                                |                              |                              |                              |         |         | 104-107 | 64-65 |
|                               |                                |                                | 152-159                        |                                | 108-111                      | 66-67                        |                              |         |         |         |       |
|                               |                                |                                | 160-191                        |                                | 160-175                      | 160-163                      |                              |         | 112-115 | 68-69   |       |
|                               |                                |                                |                                |                                |                              | 164-167                      |                              |         | 116-119 | 70-71   |       |
|                               | 176-191                        |                                |                                |                                |                              | 176-173                      |                              |         | 120-123 | 72-73   |       |
|                               |                                |                                |                                |                                |                              | 180-183                      |                              |         | 124-127 | 74-75   |       |
|                               |                                |                                |                                |                                | 192-223                      | 192-207                      |                              | 192-195 | 128-131 | 76-77   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 200-207 | 132-135 | 78-79   |       |
|                               | 208-223                        |                                |                                |                                |                              |                              |                              | 208-211 | 136-139 | 80-81   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 216-223 | 140-143 | 82-83   |       |
|                               |                                |                                | 224-255                        |                                |                              | 224-239                      | 224-227                      | 144-147 | 84-85   |         |       |
|                               |                                |                                |                                |                                |                              |                              | 232-239                      | 148-151 | 86-87   |         |       |
|                               | 240-255                        |                                |                                |                                |                              |                              | 240-247                      | 152-155 | 88-89   |         |       |
|                               |                                |                                |                                |                                |                              |                              | 248-251                      | 156-159 | 90-91   |         |       |
|                               |                                |                                |                                |                                | 128-255                      | 128-159                      | 128-143                      | 128-135 | 160-163 | 92-93   |       |
|                               |                                |                                |                                |                                |                              |                              |                              | 136-143 | 164-167 | 94-95   |       |
|                               | 144-159                        |                                |                                |                                |                              |                              | 144-151                      | 168-171 | 96-97   |         |       |
|                               |                                |                                |                                |                                |                              |                              | 152-159                      | 172-175 | 98-99   |         |       |
|                               |                                | 192-223                        | 192-207                        |                                |                              | 192-195                      | 176-179                      | 100-101 |         |         |       |
|                               |                                |                                |                                |                                |                              | 200-207                      | 180-183                      | 102-103 |         |         |       |
|                               | 208-223                        |                                |                                |                                |                              | 208-211                      | 184-187                      | 104-105 |         |         |       |
|                               |                                |                                |                                | 216-223                        |                              | 188-191                      | 106-107                      |         |         |         |       |
|                               |                                |                                | 224-255                        | 224-239                        | 224-227                      | 192-195                      | 108-109                      |         |         |         |       |
|                               |                                |                                |                                |                                | 232-239                      | 196-199                      | 110-111                      |         |         |         |       |
|                               | 240-255                        |                                |                                |                                | 240-247                      | 200-203                      | 112-113                      |         |         |         |       |
|                               |                                |                                |                                |                                | 248-251                      | 204-207                      | 114-115                      |         |         |         |       |
|                               |                                | 128-255                        |                                | 128-159                        | 128-143                      | 128-135                      | 208-211                      | 116-117 |         |         |       |
|                               |                                |                                |                                |                                |                              | 136-143                      | 212-215                      | 118-119 |         |         |       |
|                               | 144-159                        |                                |                                |                                | 144-151                      | 216-219                      | 120-121                      |         |         |         |       |
|                               |                                |                                |                                |                                | 152-159                      | 220-223                      | 122-123                      |         |         |         |       |
|                               |                                |                                | 192-223                        | 192-207                        | 192-195                      | 224-227                      | 124-125                      |         |         |         |       |
|                               |                                |                                |                                |                                | 200-207                      | 228-231                      | 126-127                      |         |         |         |       |
|                               | 208-223                        |                                |                                |                                | 208-211                      | 232-235                      | 128-129                      |         |         |         |       |
|                               |                                |                                |                                |                                | 216-223                      | 236-239                      | 130-131                      |         |         |         |       |
|                               |                                | 224-255                        |                                | 224-239                        | 224-227                      | 240-243                      | 132-133                      |         |         |         |       |
|                               |                                |                                |                                |                                | 232-239</                    |                              |                              |         |         |         |       |

## Class B Addresses

### VLSM Chart 16-23 Bits (3rd octet)

| /16<br>255.255.0.0<br>65,536 Hosts | /17<br>255.255.128.0<br>32,768 Hosts | /18<br>255.255.192.0<br>16,384 Hosts | /19<br>255.255.224.0<br>8,192 Hosts | /20<br>255.255.240.0<br>4,096 Hosts | /21<br>255.255.248.0<br>2,048 Hosts | /22<br>255.255.252.0<br>1,024 Hosts | /23<br>255.255.254.0<br>512 Hosts |
|------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------|
| 0 - 255                            | 0-127                                | 0-63                                 | 0-31                                | 0-15                                | 0-7                                 | 0-3                                 | 0-1                               |
|                                    |                                      |                                      |                                     |                                     | 8-15                                | 4-7                                 | 2-3                               |
|                                    |                                      |                                      |                                     |                                     | 16-23                               | 8-11                                | 4-5                               |
|                                    |                                      |                                      |                                     |                                     | 24-31                               | 12-15                               | 6-7                               |
|                                    |                                      |                                      |                                     |                                     | 32-39                               | 14-15                               | 8-9                               |
|                                    |                                      |                                      |                                     |                                     | 40-47                               | 16-19                               | 10-11                             |
|                                    |                                      |                                      |                                     |                                     | 48-55                               | 20-23                               | 12-13                             |
|                                    |                                      |                                      |                                     |                                     | 56-63                               | 24-27                               | 14-15                             |
|                                    |                                      |                                      |                                     |                                     | 64-71                               | 28-31                               | 16-17                             |
|                                    |                                      |                                      |                                     |                                     | 72-79                               | 32-35                               | 18-19                             |
|                                    |                                      |                                      | 32-63                               | 16-31                               | 80-87                               | 36-39                               | 20-21                             |
|                                    |                                      |                                      |                                     |                                     | 88-95                               | 40-43                               | 22-23                             |
|                                    |                                      |                                      |                                     |                                     | 96-99                               | 44-47                               | 24-25                             |
|                                    |                                      |                                      |                                     |                                     | 100-103                             | 48-51                               | 26-27                             |
|                                    |                                      |                                      |                                     |                                     | 104-111                             | 52-55                               | 28-29                             |
|                                    |                                      |                                      |                                     |                                     | 112-119                             | 56-59                               | 30-31                             |
|                                    |                                      |                                      |                                     |                                     | 120-127                             | 60-63                               | 32-33                             |
|                                    |                                      |                                      |                                     |                                     | 128-135                             | 64-67                               | 34-35                             |
|                                    |                                      |                                      |                                     |                                     | 136-143                             | 68-71                               | 36-37                             |
|                                    |                                      |                                      |                                     |                                     | 144-151                             | 72-75                               | 38-39                             |
|                                    |                                      |                                      | 64-127                              | 80-95                               | 152-155                             | 76-79                               | 40-41                             |
|                                    |                                      |                                      |                                     |                                     | 156-159                             | 80-83                               | 42-43                             |
|                                    |                                      |                                      |                                     |                                     | 160-163                             | 84-87                               | 44-45                             |
|                                    |                                      |                                      |                                     |                                     | 164-167                             | 88-91                               | 46-47                             |
|                                    |                                      |                                      |                                     |                                     | 168-171                             | 92-95                               | 48-49                             |
|                                    |                                      |                                      |                                     | 96-111                              | 172-175                             | 96-99                               | 50-51                             |
|                                    |                                      |                                      |                                     |                                     | 176-179                             | 100-103                             | 52-53                             |
|                                    |                                      |                                      |                                     |                                     | 180-183                             | 104-107                             | 54-55                             |
|                                    |                                      |                                      |                                     |                                     | 184-187                             | 108-111                             | 56-57                             |
|                                    |                                      |                                      |                                     |                                     | 188-191                             | 112-115                             | 58-59                             |
|                                    |                                      |                                      | 128-191                             | 128-143                             | 192-195                             | 116-119                             | 60-61                             |
|                                    |                                      |                                      |                                     |                                     | 196-199                             | 120-123                             | 62-63                             |
|                                    |                                      |                                      |                                     |                                     | 200-203                             | 124-127                             | 64-65                             |
|                                    |                                      |                                      |                                     |                                     | 204-207                             | 128-131                             | 66-67                             |
|                                    |                                      |                                      |                                     |                                     | 208-211                             | 132-135                             | 68-69                             |
|                                    |                                      |                                      |                                     | 160-191                             | 212-215                             | 136-139                             | 70-71                             |
|                                    |                                      |                                      |                                     |                                     | 216-219                             | 140-143                             | 72-73                             |
|                                    |                                      |                                      |                                     |                                     | 220-223                             | 144-147                             | 74-75                             |
|                                    |                                      |                                      |                                     |                                     | 224-227                             | 148-151                             | 76-77                             |
|                                    |                                      |                                      |                                     |                                     | 228-231                             | 152-155                             | 78-79                             |
|                                    |                                      |                                      | 128-255                             | 144-159                             | 232-235                             | 156-159                             | 80-81                             |
|                                    |                                      |                                      |                                     |                                     | 236-239                             | 160-163                             | 82-83                             |
|                                    |                                      |                                      |                                     |                                     | 240-243                             | 164-167                             | 84-85                             |
|                                    |                                      |                                      |                                     |                                     | 244-247                             | 168-171                             | 86-87                             |
|                                    |                                      |                                      |                                     |                                     | 248-251                             | 172-175                             | 88-89                             |
|                                    |                                      |                                      |                                     | 160-191                             | 252-255                             | 176-179                             | 90-91                             |
|                                    |                                      |                                      |                                     |                                     | 128-135                             | 180-183                             | 92-93                             |
|                                    |                                      |                                      |                                     |                                     | 136-143                             | 184-187                             | 94-95                             |
|                                    |                                      |                                      |                                     |                                     | 144-151                             | 188-191                             | 96-97                             |
|                                    |                                      |                                      |                                     |                                     | 152-155                             | 192-195                             | 98-99                             |
|                                    |                                      |                                      | 64-127                              | 96-111                              | 196-199                             | 196-199                             | 100-101                           |
|                                    |                                      |                                      |                                     |                                     | 200-203                             | 200-203                             | 102-103                           |
|                                    |                                      |                                      |                                     |                                     | 204-207                             | 204-207                             | 104-105                           |
|                                    |                                      |                                      |                                     |                                     | 208-211                             | 208-211                             | 106-107                           |
|                                    |                                      |                                      |                                     |                                     | 212-215                             | 212-215                             | 108-109                           |
|                                    |                                      |                                      |                                     | 128-159                             | 216-219                             | 216-219                             | 110-111                           |
|                                    |                                      |                                      |                                     |                                     | 220-223                             | 220-223                             | 112-113                           |
|                                    |                                      |                                      |                                     |                                     | 224-227                             | 224-227                             | 114-115                           |
|                                    |                                      |                                      |                                     |                                     | 228-231                             | 228-231                             | 116-117                           |
|                                    |                                      |                                      |                                     |                                     | 232-235                             | 232-235                             | 118-119                           |
|                                    |                                      |                                      | 128-191                             | 160-191                             | 236-239                             | 236-239                             | 120-121                           |
|                                    |                                      |                                      |                                     |                                     | 240-243                             | 240-243                             | 122-123                           |
|                                    |                                      |                                      |                                     |                                     | 244-247                             | 244-247                             | 124-125                           |
|                                    |                                      |                                      |                                     |                                     | 248-251                             | 248-251                             | 126-127                           |
|                                    |                                      |                                      |                                     |                                     | 252-255                             | 252-255                             | 128-129                           |
|                                    |                                      |                                      |                                     | 128-159                             | 128-135                             | 128-135                             | 130-131                           |
|                                    |                                      |                                      |                                     |                                     | 136-143                             | 136-143                             | 132-133                           |
|                                    |                                      |                                      |                                     |                                     | 144-151                             | 144-151                             | 134-135                           |
|                                    |                                      |                                      |                                     |                                     | 152-155                             | 152-155                             | 136-137                           |
|                                    |                                      |                                      |                                     |                                     | 156-159                             | 156-159                             | 138-139                           |
|                                    |                                      |                                      | 64-127                              | 96-111                              | 160-163                             | 160-163                             | 140-141                           |
|                                    |                                      |                                      |                                     |                                     | 164-167                             | 164-167                             | 142-143                           |
|                                    |                                      |                                      |                                     |                                     | 168-171                             | 168-171                             | 144-145                           |
|                                    |                                      |                                      |                                     |                                     | 172-175                             | 172-175                             | 146-147                           |
|                                    |                                      |                                      |                                     |                                     | 176-179                             | 176-179                             | 148-149                           |
|                                    |                                      |                                      |                                     | 128-159                             | 180-183                             | 180-183                             | 150-151                           |
|                                    |                                      |                                      |                                     |                                     | 184-187                             | 184-187                             | 152-153                           |
|                                    |                                      |                                      |                                     |                                     | 188-191                             | 188-191                             | 154-155                           |
|                                    |                                      |                                      |                                     |                                     | 192-195                             | 192-195                             | 156-157                           |
|                                    |                                      |                                      |                                     |                                     | 196-199                             | 196-199                             | 158-159                           |
|                                    |                                      |                                      | 128-191                             | 160-191                             | 200-203                             | 200-203                             | 160-161                           |
|                                    |                                      |                                      |                                     |                                     | 204-207                             | 204-207                             | 162-163                           |
|                                    |                                      |                                      |                                     |                                     | 208-211                             | 208-211                             | 164-165                           |
|                                    |                                      |                                      |                                     |                                     | 212-215                             | 212-215                             | 166-167                           |
|                                    |                                      |                                      |                                     |                                     | 216-219                             | 216-219                             | 168-169                           |
|                                    |                                      |                                      |                                     | 128-159                             | 220-223                             | 220-223                             | 170-171                           |
|                                    |                                      |                                      |                                     |                                     | 224-227                             | 224-227                             | 172-173                           |
|                                    |                                      |                                      |                                     |                                     | 228-231                             | 228-231                             | 174-175                           |
|                                    |                                      |                                      |                                     |                                     | 232-235                             | 232-235                             | 176-177                           |
|                                    |                                      |                                      |                                     |                                     | 236-239                             | 236-239                             | 178-179                           |
|                                    |                                      |                                      | 64-127                              | 96-111                              | 240-243                             | 240-243                             | 180-181                           |
|                                    |                                      |                                      |                                     |                                     | 244-247                             | 244-247                             | 182-183                           |
|                                    |                                      |                                      |                                     |                                     | 248-251                             | 248-251                             | 184-185                           |
|                                    |                                      |                                      |                                     |                                     | 252-255                             | 252-255                             | 186-187                           |
|                                    |                                      |                                      |                                     |                                     | 128-135                             | 128-135                             | 188-189                           |
|                                    |                                      |                                      |                                     | 128-159                             | 136-143                             | 136-143                             | 190-191                           |
|                                    |                                      |                                      |                                     |                                     | 144-151                             | 144-151                             | 192-193                           |
|                                    |                                      |                                      |                                     |                                     | 152-155                             | 152-155                             | 194-195                           |
|                                    |                                      |                                      |                                     |                                     | 156-159                             | 156-159                             | 196-197                           |
|                                    |                                      |                                      |                                     |                                     | 160-163                             | 160-163                             | 198-199                           |
|                                    |                                      |                                      | 128-191                             | 160-191                             | 164-167                             | 164-167                             | 200-201                           |
|                                    |                                      |                                      |                                     |                                     | 168-171                             | 168-171                             | 202-203                           |
|                                    |                                      |                                      |                                     |                                     | 172-175                             | 172-175                             | 204-205                           |
|                                    |                                      |                                      |                                     |                                     | 176-179                             | 176-179                             | 206-207                           |
|                                    |                                      |                                      |                                     |                                     | 180-183                             | 180-183                             | 208-209                           |
|                                    |                                      |                                      |                                     | 128-159                             | 184-187                             | 184-187                             | 210-211                           |
|                                    |                                      |                                      |                                     |                                     | 188-191                             | 188-191                             | 212-213                           |
|                                    |                                      |                                      |                                     |                                     | 192-195                             | 192-195                             | 214-215                           |
|                                    |                                      |                                      |                                     |                                     | 196-199                             | 196-199                             | 216-217                           |
|                                    |                                      |                                      |                                     |                                     | 200-203                             | 200-203                             | 218-219                           |
|                                    |                                      |                                      | 64-127                              | 96-111                              | 204-207                             | 204-207                             | 220-221                           |
|                                    |                                      |                                      |                                     |                                     | 208-211                             | 208-211                             | 222-223                           |
|                                    |                                      |                                      |                                     |                                     | 212-215                             | 212-215                             | 224-225                           |
|                                    |                                      |                                      |                                     |                                     | 216-219                             | 216-219                             | 226-227                           |
|                                    |                                      |                                      |                                     |                                     | 220-223                             | 220-223                             | 228-229                           |
|                                    |                                      |                                      |                                     | 128-159                             | 224-227                             | 224-227                             | 230-231                           |
|                                    |                                      |                                      |                                     |                                     | 228-231                             | 228-231                             | 232-233                           |
|                                    |                                      |                                      |                                     |                                     | 232-235                             | 232-235                             | 234-235                           |
|                                    |                                      |                                      |                                     |                                     | 236-239                             | 236-239                             | 236-237                           |
|                                    |                                      |                                      |                                     |                                     | 240-243                             | 240-243                             | 238-239                           |
|                                    |                                      |                                      | 128-191                             | 160-191                             | 244-247                             | 244-247                             | 240-241                           |
|                                    |                                      |                                      |                                     |                                     | 248-251                             | 248-251                             | 242-243                           |
|                                    |                                      |                                      |                                     |                                     | 252-255                             | 252-255                             | 244-245                           |
|                                    |                                      |                                      |                                     |                                     | 128-135                             | 128-135                             | 246-247                           |
|                                    |                                      |                                      |                                     |                                     | 136-143                             | 136-143                             | 248-249                           |
|                                    |                                      |                                      |                                     | 128-159                             | 144-151                             | 144-151                             | 250-251                           |
|                                    |                                      |                                      |                                     |                                     | 152-155                             | 152-155                             | 252-253                           |
|                                    |                                      |                                      |                                     |                                     | 156-159                             | 156-159                             | 254-255                           |
|                                    |                                      |                                      |                                     |                                     | 160-163                             | 160-163                             | 256-257                           |
|                                    |                                      |                                      |                                     |                                     | 164-167                             | 164-167                             | 258-259                           |

## Class C Addresses

### VLSM Chart 24-30 Bits (4th octet)

| /24<br>255.255.255.0<br>256 Hosts | /25<br>255.255.255.128<br>128 Hosts | /26<br>255.255.255.192<br>64 Hosts | /27<br>255.255.255.224<br>32 Hosts | /28<br>255.255.255.240<br>16 Hosts | /29<br>255.255.255.248<br>8 Hosts | /30<br>255.255.255.252<br>4 Hosts |       |
|-----------------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-------|
| 0 - 255                           | 0-127                               | 0-63                               | 0-31                               | 0-15                               | 0-7                               | 0-3                               |       |
|                                   |                                     |                                    |                                    |                                    | 8-15                              | 4-7                               |       |
|                                   |                                     |                                    |                                    |                                    | 16-23                             | 8-11                              |       |
|                                   |                                     |                                    |                                    | 24-31                              | 12-15                             |                                   |       |
|                                   |                                     |                                    |                                    | 32-63                              | 32-47                             | 32-39                             | 16-19 |
|                                   |                                     |                                    |                                    |                                    |                                   |                                   | 40-43 |
|                                   |                                     |                                    | 44-47                              |                                    |                                   |                                   |       |
|                                   |                                     |                                    | 48-63                              |                                    | 48-55                             | 20-23                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 24-27                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 28-31                             |       |
|                                   |                                     |                                    | 64-127                             | 64-95                              | 64-71                             | 64-79                             | 32-35 |
|                                   |                                     |                                    |                                    |                                    |                                   |                                   | 36-39 |
|                                   |                                     | 40-43                              |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 80-95                              |                                    |                                    | 80-87                             | 44-47                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 48-51                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 52-55                             |       |
|                                   |                                     | 96-127                             |                                    | 96-103                             | 96-111                            | 56-59                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 60-63                             |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 64-67                             |       |
|                                   |                                     |                                    |                                    | 112-127                            | 104-111                           | 112-119                           | 68-71 |
|                                   |                                     |                                    |                                    |                                    |                                   |                                   | 72-75 |
|                                   |                                     |                                    |                                    |                                    |                                   |                                   | 76-79 |
|                                   |                                     | 120-127                            | 128-131                            |                                    | 80-83                             |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 84-87                             |                                   |       |
|                                   | 88-91                               |                                    |                                    |                                    |                                   |                                   |       |
|                                   | 128-255                             | 128-191                            | 128-159                            | 128-143                            | 92-95                             |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 96-99                             |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 100-103                           |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 104-107                           |                                   |       |
|                                   |                                     |                                    |                                    | 144-159                            | 108-111                           |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 112-115                           |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 116-119                           |                                   |       |
|                                   |                                     |                                    |                                    |                                    | 120-123                           |                                   |       |
|                                   |                                     |                                    | 160-191                            | 160-167                            | 160-175                           | 124-127                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 128-135                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 132-135                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 136-139                           |       |
|                                   |                                     |                                    |                                    | 176-191                            | 176-183                           | 140-143                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 144-147                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 148-151                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 152-155                           |       |
|                                   |                                     | 192-255                            | 192-223                            | 192-207                            | 192-199                           | 156-159                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 160-163                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 164-167                           |       |
|                                   |                                     |                                    |                                    | 208-223                            | 208-215                           | 168-175                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 172-175                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 176-179                           |       |
|                                   |                                     |                                    | 224-255                            | 224-231                            | 224-239                           | 180-183                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 184-187                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 188-191                           |       |
|                                   |                                     |                                    |                                    | 240-255                            | 240-247                           | 192-195                           |       |
|                                   |                                     |                                    |                                    |                                    |                                   | 196-199                           |       |
| 200-203                           |                                     |                                    |                                    |                                    |                                   |                                   |       |
| 248-255                           | 248-255                             | 204-207                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 208-211                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 212-215                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 216-219                            |                                    |                                    |                                   |                                   |       |
| 252-255                           | 252-255                             | 220-223                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 224-227                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 228-231                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 232-235                            |                                    |                                    |                                   |                                   |       |
| 256-259                           | 256-259                             | 236-239                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 240-243                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 244-247                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 248-251                            |                                    |                                    |                                   |                                   |       |
| 260-263                           | 260-263                             | 252-255                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 256-259                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 260-263                            |                                    |                                    |                                   |                                   |       |
|                                   |                                     | 264-267                            |                                    |                                    |                                   |                                   |       |

| Class A Addressing Guide |                    |                 |                    |                  |                   |
|--------------------------|--------------------|-----------------|--------------------|------------------|-------------------|
| CIDR                     | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
| /8                       | 0                  | 255.0.0.0       | 1                  | 16,777,216       | 16,777,214        |
| /9                       | 1                  | 255.128.0.0     | 2                  | 8,388,608        | 8,388,606         |
| /10                      | 2                  | 255.192.0.0     | 4                  | 4,194,304        | 4,194,302         |
| /11                      | 3                  | 255.224.0.0     | 8                  | 2,097,152        | 2,097,150         |
| /12                      | 4                  | 255.240.0.0     | 16                 | 1,048,576        | 1,048,574         |
| /13                      | 5                  | 255.248.0.0     | 32                 | 524,288          | 524,286           |
| /14                      | 6                  | 255.252.0.0     | 64                 | 262,144          | 262,142           |
| /15                      | 7                  | 255.254.0.0     | 128                | 131,072          | 131,070           |
| /16                      | 8                  | 255.255.0.0     | 256                | 65,536           | 65,534            |
| /17                      | 9                  | 255.255.128.0   | 512                | 32,768           | 32,766            |
| /18                      | 10                 | 255.255.192.0   | 1,024              | 16,384           | 16,382            |
| /19                      | 11                 | 255.255.224.0   | 2,048              | 8,192            | 8,190             |
| /20                      | 12                 | 255.255.240.0   | 4,096              | 4,096            | 4,094             |
| /21                      | 13                 | 255.255.248.0   | 8,192              | 2,048            | 2,046             |
| /22                      | 14                 | 255.255.252.0   | 16,384             | 1,024            | 1,022             |
| /23                      | 15                 | 255.255.254.0   | 32,768             | 512              | 510               |
| /24                      | 16                 | 255.255.255.0   | 65,536             | 256              | 254               |
| /25                      | 17                 | 255.255.255.128 | 131,072            | 128              | 126               |
| /26                      | 18                 | 255.255.255.192 | 262,144            | 64               | 62                |
| /27                      | 19                 | 255.255.255.224 | 524,288            | 32               | 30                |
| /28                      | 20                 | 255.255.255.240 | 1,048,576          | 16               | 14                |
| /29                      | 21                 | 255.255.255.248 | 2,097,152          | 8                | 6                 |
| /30                      | 22                 | 255.255.255.252 | 4,194,304          | 4                | 2                 |

| Class B Addressing Guide |                    |                 |                    |                  |                   |
|--------------------------|--------------------|-----------------|--------------------|------------------|-------------------|
| CIDR                     | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
| /16                      | 0                  | 255.255.0.0     | 1                  | 65,536           | 65,534            |
| /17                      | 1                  | 255.255.128.0   | 2                  | 32,768           | 32,766            |
| /18                      | 2                  | 255.255.192.0   | 4                  | 16,384           | 16,382            |
| /19                      | 3                  | 255.255.224.0   | 8                  | 8,192            | 8,190             |
| /20                      | 4                  | 255.255.240.0   | 16                 | 4,096            | 4,094             |
| /21                      | 5                  | 255.255.248.0   | 32                 | 2,048            | 2,046             |
| /22                      | 6                  | 255.255.252.0   | 64                 | 1,024            | 1,022             |
| /23                      | 7                  | 255.255.254.0   | 128                | 512              | 510               |
| /24                      | 8                  | 255.255.255.0   | 256                | 256              | 254               |
| /25                      | 9                  | 255.255.255.128 | 512                | 128              | 126               |
| /26                      | 10                 | 255.255.255.192 | 1,024              | 64               | 62                |
| /27                      | 11                 | 255.255.255.224 | 2,048              | 32               | 30                |
| /28                      | 12                 | 255.255.255.240 | 4,096              | 16               | 14                |
| /29                      | 13                 | 255.255.255.248 | 8,192              | 8                | 6                 |
| /30                      | 14                 | 255.255.255.252 | 16,384             | 4                | 2                 |

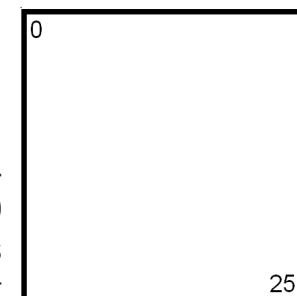
| Class C Addressing Guide |                    |                 |                    |                  |                   |
|--------------------------|--------------------|-----------------|--------------------|------------------|-------------------|
| CIDR                     | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
| /24                      | 0                  | 255.255.255.0   | 1                  | 256              | 254               |
| /25                      | 1                  | 255.255.255.128 | 2                  | 128              | 126               |
| /26                      | 2                  | 255.255.255.192 | 4                  | 64               | 62                |
| /27                      | 3                  | 255.255.255.224 | 8                  | 32               | 30                |
| /28                      | 4                  | 255.255.255.240 | 16                 | 16               | 14                |
| /29                      | 5                  | 255.255.255.248 | 32                 | 8                | 6                 |
| /30                      | 6                  | 255.255.255.252 | 64                 | 4                | 2                 |

## Visualizing Subnets Using The Box Method

The box method is the simplest way to visualize the breakdown of subnets and addresses into smaller sizes.

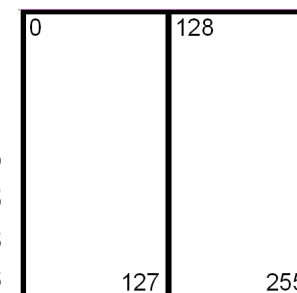
Start with a square. The whole square is a single subnet comprised of 256 addresses.

/24  
255.255.255.0  
256 Hosts  
1 Subnet



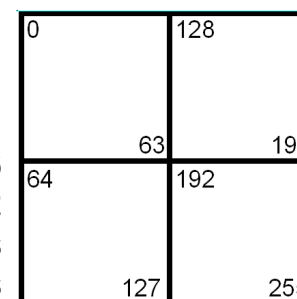
Split the box in half and you get two subnets with 128 addresses,

/25  
255.255.255.128  
128 Hosts  
2 Subnets



Divide the box into quarters and you get four subnets with 64 addresses,

/26  
255.255.255.192  
64 Hosts  
4 Subnets



Split each individual square and you get eight subnets with 32 addresses,

**/27**  
**255.255.255.224**  
**32 Hosts**  
**8 Subnets**

|    |    |     |     |
|----|----|-----|-----|
| 0  | 32 | 128 | 160 |
|    |    |     |     |
|    | 31 | 63  | 159 |
| 64 | 96 | 192 | 224 |
|    |    |     |     |
|    | 95 | 127 | 223 |
|    |    |     | 256 |

Split the boxes in half again and you get sixteen subnets with sixteen addresses,

**/28**  
**255.255.255.240**  
**16 Hosts**  
**16 Subnets**

|    |     |     |     |
|----|-----|-----|-----|
| 0  | 32  | 128 | 160 |
|    | 15  | 47  | 143 |
| 16 | 48  | 144 | 176 |
|    |     |     |     |
|    | 31  | 63  | 159 |
| 64 | 96  | 192 | 224 |
|    | 79  | 111 | 207 |
| 80 | 112 | 208 | 240 |
|    |     |     |     |
|    | 95  | 127 | 223 |
|    |     |     | 256 |

The next split gives you thirty two subnets with eight addresses,

**/29**  
**255.255.255.248**  
**8 Hosts**  
**32 Subnets**

|    |    |     |     |     |     |     |     |
|----|----|-----|-----|-----|-----|-----|-----|
| 0  | 8  | 32  | 40  | 128 | 136 | 160 | 168 |
|    | 7  | 15  | 39  | 47  | 135 | 143 | 167 |
| 16 | 24 | 48  | 56  | 144 | 152 | 176 | 184 |
|    |    |     |     |     |     |     |     |
|    | 23 | 31  | 55  | 63  | 151 | 159 | 183 |
| 64 | 72 | 96  | 104 | 192 | 200 | 224 | 232 |
|    | 71 | 79  | 103 | 111 | 199 | 207 | 321 |
| 80 | 88 | 112 | 120 | 208 | 216 | 240 | 248 |
|    |    |     |     |     |     |     |     |
|    | 87 | 95  | 119 | 127 | 215 | 223 | 247 |
|    |    |     |     |     |     |     | 256 |

The last split gives sixty four subnets with four addresses each,

**/30**  
**255.255.255.252**  
**4 Hosts**  
**64 Subnets**

|    |    |     |     |     |     |     |     |
|----|----|-----|-----|-----|-----|-----|-----|
| 0  | 8  | 32  | 40  | 128 | 136 | 160 | 168 |
|    | 3  | 11  | 35  | 43  | 131 | 139 | 163 |
| 4  | 12 | 36  | 44  | 132 | 140 | 164 | 172 |
|    | 7  | 15  | 39  | 47  | 135 | 143 | 167 |
| 16 | 24 | 48  | 56  | 144 | 152 | 176 | 184 |
|    | 19 | 27  | 51  | 59  | 147 | 155 | 179 |
| 20 | 28 | 52  | 60  | 148 | 156 | 180 | 188 |
|    | 23 | 31  | 55  | 63  | 151 | 159 | 183 |
| 64 | 72 | 96  | 104 | 192 | 200 | 224 | 232 |
|    | 67 | 75  | 99  | 107 | 195 | 203 | 227 |
| 68 | 76 | 100 | 108 | 196 | 204 | 228 | 236 |
|    | 71 | 79  | 103 | 111 | 199 | 207 | 321 |
| 80 | 88 | 112 | 120 | 208 | 216 | 240 | 248 |
|    | 83 | 91  | 115 | 123 | 211 | 219 | 243 |
| 84 | 92 | 116 | 124 | 212 | 220 | 244 | 252 |
|    | 87 | 95  | 119 | 127 | 215 | 223 | 247 |
|    |    |     |     |     |     |     | 256 |

## Class A Addressing Guide

| CIDR | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
|------|--------------------|-----------------|--------------------|------------------|-------------------|
| /8   | 0                  | 255.0.0.0       | 1                  | 16,777,216       | 16,777,214        |
| /9   | 1                  | 255.128.0.0     | 2                  | 8,388,608        | 8,388,606         |
| /10  | 2                  | 255.192.0.0     | 4                  | 4,194,304        | 4,194,302         |
| /11  | 3                  | 255.224.0.0     | 8                  | 2,097,152        | 2,097,150         |
| /12  | 4                  | 255.240.0.0     | 16                 | 1,048,576        | 1,048,574         |
| /13  | 5                  | 255.248.0.0     | 32                 | 524,288          | 524,286           |
| /14  | 6                  | 255.252.0.0     | 64                 | 262,144          | 262,142           |
| /15  | 7                  | 255.254.0.0     | 128                | 131,072          | 131,070           |
| /16  | 8                  | 255.255.0.0     | 256                | 65,536           | 65,534            |
| /17  | 9                  | 255.255.128.0   | 512                | 32,768           | 32,766            |
| /18  | 10                 | 255.255.192.0   | 1,024              | 16,384           | 16,382            |
| /19  | 11                 | 255.255.224.0   | 2,048              | 8,192            | 8,190             |
| /20  | 12                 | 255.255.240.0   | 4,096              | 4,096            | 4,094             |
| /21  | 13                 | 255.255.248.0   | 8,192              | 2,048            | 2,046             |
| /22  | 14                 | 255.255.252.0   | 16,384             | 1,024            | 1,022             |
| /23  | 15                 | 255.255.254.0   | 32,768             | 512              | 510               |
| /24  | 16                 | 255.255.255.0   | 65,536             | 256              | 254               |
| /25  | 17                 | 255.255.255.128 | 131,072            | 128              | 126               |
| /26  | 18                 | 255.255.255.192 | 262,144            | 64               | 62                |
| /27  | 19                 | 255.255.255.224 | 524,288            | 32               | 30                |
| /28  | 20                 | 255.255.255.240 | 1,048,576          | 16               | 14                |
| /29  | 21                 | 255.255.255.248 | 2,097,152          | 8                | 6                 |
| /30  | 22                 | 255.255.255.252 | 4,194,304          | 4                | 2                 |

## Class B Addressing Guide

| CIDR | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
|------|--------------------|-----------------|--------------------|------------------|-------------------|
| /16  | 0                  | 255.255.0.0     | 1                  | 65,536           | 65,534            |
| /17  | 1                  | 255.255.128.0   | 2                  | 32,768           | 32,766            |
| /18  | 2                  | 255.255.192.0   | 4                  | 16,384           | 16,382            |
| /19  | 3                  | 255.255.224.0   | 8                  | 8,192            | 8,190             |
| /20  | 4                  | 255.255.240.0   | 16                 | 4,096            | 4,094             |
| /21  | 5                  | 255.255.248.0   | 32                 | 2,048            | 2,046             |
| /22  | 6                  | 255.255.252.0   | 64                 | 1,024            | 1,022             |
| /23  | 7                  | 255.255.254.0   | 128                | 512              | 510               |
| /24  | 8                  | 255.255.255.0   | 256                | 256              | 254               |
| /25  | 9                  | 255.255.255.128 | 512                | 128              | 126               |
| /26  | 10                 | 255.255.255.192 | 1,024              | 64               | 62                |
| /27  | 11                 | 255.255.255.224 | 2,048              | 32               | 30                |
| /28  | 12                 | 255.255.255.240 | 4,096              | 16               | 14                |
| /29  | 13                 | 255.255.255.248 | 8,192              | 8                | 6                 |
| /30  | 14                 | 255.255.255.252 | 16,384             | 4                | 2                 |

## Class C Addressing Guide

| CIDR | # of Bits Borrowed | Subnet Mask     | Total # of Subnets | Total # of Hosts | Usable # of Hosts |
|------|--------------------|-----------------|--------------------|------------------|-------------------|
| /24  | 0                  | 255.255.255.0   | 1                  | 256              | 254               |
| /25  | 1                  | 255.255.255.128 | 2                  | 128              | 126               |
| /26  | 2                  | 255.255.255.192 | 4                  | 64               | 62                |
| /27  | 3                  | 255.255.255.224 | 8                  | 32               | 30                |
| /28  | 4                  | 255.255.255.240 | 16                 | 16               | 14                |
| /29  | 5                  | 255.255.255.248 | 32                 | 8                | 6                 |
| /30  | 6                  | 255.255.255.252 | 64                 | 4                | 2                 |

