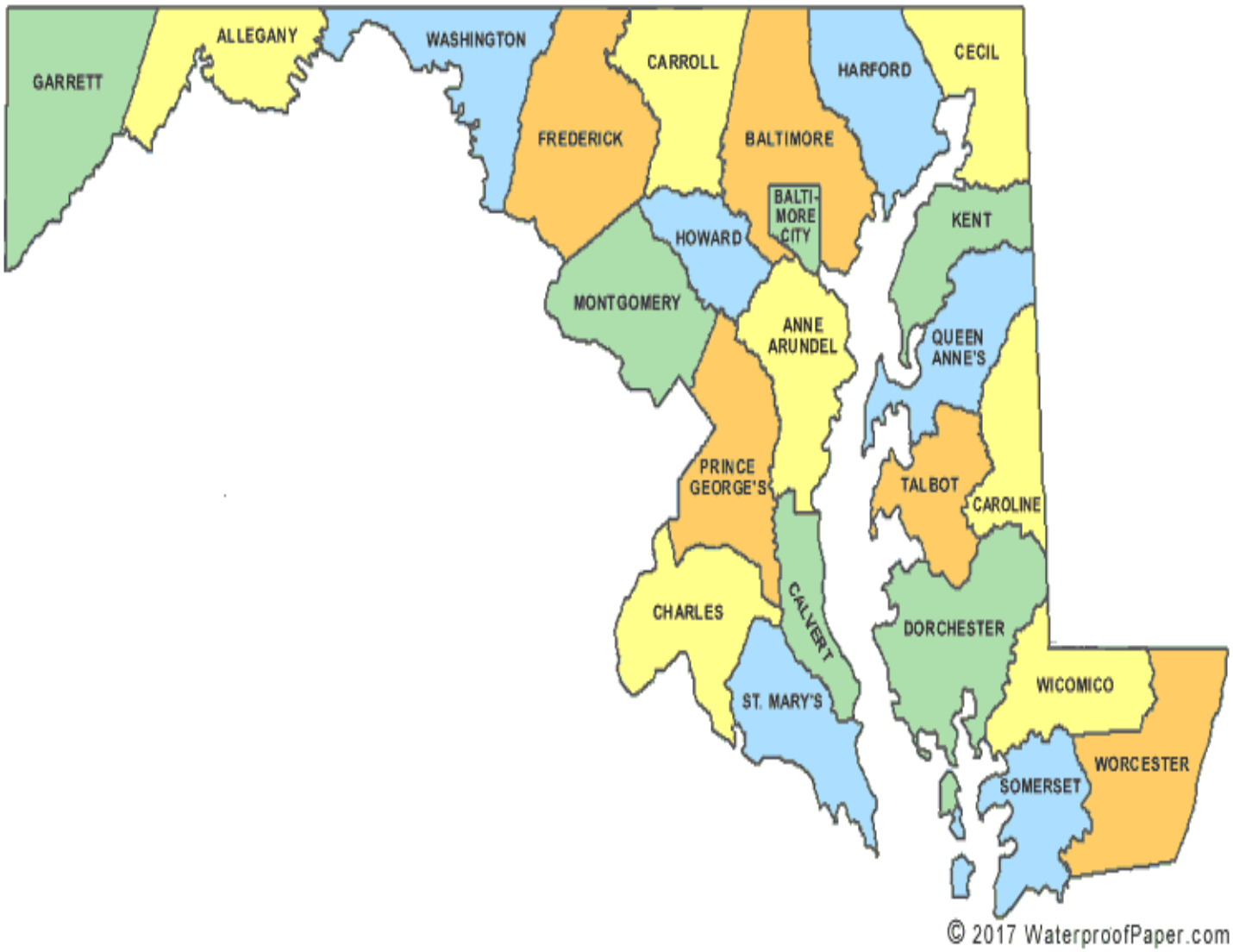


# Maryland State
# 44 Net / AMPR.ORG
# IP Subnet Plan

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This plan will describe the subnetting of the IPv4 address range allocated to the amateur radio community in Maryland. Currently all IPv4 addresses available to Maryland are co-ordinated by Charles Hargrove, N2NOV. The latest version of this document may be downloaded from **http://HamGateMDE.n2nov.net/Maryland_State_Subnet_Plan.pdf**

The following IPv4 address subnet is allocated to the amateur radio community in Maryland:

**44.60.0.0 / 255.255.0.0**

It shall be further broken down into smaller subnets so as to allow all radio hams in the state to be allocated an address that will be geographically relevant and routable. The plan is based on a "hub and spoke" principal. Each county in the state will be allocated its own subnet. A regional hub (or hubs) will be assigned numbers from their subnet and in turn the hubs will issue addresses to their users. The master hub will be called **"hamgatemd"** which will reside on the Internet. The purpose of the hubs will be to control traffic to and from the Maryland network so as to meet current FCC Part 97 rules and to help prevent unwanted traffic from escaping onto an RF based LAN. HamGateMD hubs will not prevent RF based users from accessing the Internet should they so wish. Where possible all hubs will be accessible from both the Internet and a local RF LAN. Users may or may not be connected to the Internet, but will be connected via RF to their local hub. The regional hubs will be free to create any RF based LAN they so choose and are strongly encouraged to try experimental data transport methods. Data repeaters such as D-STAR, C4FM, DMR and HamNet (AREDN) are also encouraged to participate in this addressing scheme. The ultimate goal is that of interoperability. All hubs and users on the network will use the **"*host*.ampr.org"** naming convention. For the purposes of DNS entries, A, AAAA and CNAME records will be allowed and where possible MX records will be populated.

**A word about IP and subnets etc:**
Most readers will be familiar with expressions such as "subnet", "netmask" and "gateway" from their exposure to their cable modems at home. However, most users will not understand what these terms mean. In short, the numbers that represent these expressions describe how many IP addresses are available to the local network, how to calculate the location of any IP address and where to go if you cannot reach your intended destination address directly on your LAN.

Just like your cable modem and WiFi router, the ham radio TCP/IP network uses subnets, netmasks and gateways to navigate around hosts for the purposes of sending email, viewing the Dxcluster, etc.

Unlike your equipment at home, when you join the Maryland ham radio data community you will be issued a set of numbers that will not only allow you to communicate with your fellow hams but also communicate worldwide via the Internet.

Your allocation is indeed an honest-to-goodness "real" IP address. Unlike the IP addresses you are familiar with in your home (192.168.x.x) which are repeated almost everywhere you go, your numbers are unique to you! Like all things in ham radio, the "big boys" want our stuff. There are no more IPv4 addresses available anywhere in the world and so your allocation is a valuable commodity just like your RF space. Use it or lose it!!!! (remember the 220 band in the 1990's?)

And in case you were wondering, there are PLENTY of numbers for the ham community thanks to the foresight of the original pioneers of packet radio, so please use as many as you can justify. Each of the 23 counties in MD has over 2,000 addresses available. More is available should the need arise.

In the event that you lose interest in our data community, your numbers will be returned to the pool held for your county and issued to the next requesting user in that county.

**It's all in the numbers:**
There are a little over 65,500 IP addresses available to Maryland. Of that number, over 47,000 are shared among the various counties around the state leaving some 18,000 remaining should there be a need to “back fill” somewhere for a special project or for BGP. Should you have a need for more numbers than is available in your county please contact your coordinator to discuss your proposals.

The IP subnet details for a sample county is listed below. These subnets are further reduced to better fit the needs of any given county network between traditional packet messaging systems and experimental uses like VoIP and HSMM/Mesh networks. The 44 Net is understood to be routable packets to other systems by either RF/wireless LANs or the internet via IPIP encapsulation (VPN).

**For example:**

| **Garrett County, MD** | 44.60.16.1/255.255.248.0 |
|---|---|
| Subnet | 44.60.16.0/21 |
| Range | 44.60.16.1 – 44.60.23.254 (max. 2,046 hosts) |
| Network | 44.60.16.0 |
| Broadcast | 44.60.23.255 |
| Gateway | 44.60.16.1 |
| AX25 Hierarchical Address | *host*.#garr.md.usa.noam |

Each county **/21** network can be broken up into two **/22** networks like this:

| **Traditional Packet BBS** | 44.60.16.1/255.255.252.0 |
|---|---|
| Subnet | 44.60.16.0/22 |
| Range | 44.60.16.1 – 44.60.19.254 (max. 1,022 hosts) |
| Network | 44.60.16.0 |
| Broadcast | 44.60.19.255 |
| Gateway | 44.60.16.1 |

| **Experimental Uses** | 44.60.20.1/255.255.252.0 |
|---|---|
| Subnet | 44.60.20.0/22 |
| Range | 44.60.20.1 – 44.60.23.254 (max. 1,022 hosts) |
| Network | 44.60.20.0 |
| Broadcast | 44.60.23.255 |
| Gateway | 44.60.20.1 |

Requestors will then be issued a smaller subnet based on the number of routable addresses needed:

| | |
|---|---|
| /29 | 6 usable addresses |
| /28 | 14 |
| /27 | 30 |
| /26 | 62 |
| /25 | 126 |
| /24 | 254 |

The below chart shows the 23 counties of Maryland with their associated IP range assignments, the National Weather Service FIPS code for weather radio alerting, the Maryland county 4 letter code that is used in the AX25 hierarchical addressing template and the 1 to 5 prefixes of USPS Zip Codes in each county for NTS message routing purposes for the MDC ARRL Section.

| County | FIPS | Code | Section | Subnet /21 | Packet /22 | Other /22 | ZIP1 | ZIP2 | ZIP3 | ZIP4 | ZIP5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***SPARE 1*** | | | **MDC** | **0** | **0** | **4** | | | | | |
| ***SPARE 2*** | | | **MDC** | **8** | **8** | **12** | | | | | |
| **GARRETT** | 24023 | GARR | MDC | 16 | 16 | 20 | 215 | | | | |
| **ALLEGANY** | 24001 | ALLE | MDC | 24 | 24 | 28 | 215 | 217 | | | |
| **WASHINGTON** | 24043 | WASH | MDC | 32 | 32 | 36 | 217 | | | | |
| **FREDERICK** | 24021 | FRED | MDC | 40 | 40 | 44 | 208 | 217 | | | |
| **CARROLL** | 24013 | CARR | MDC | 48 | 48 | 52 | 210 | 211 | 217 | | |
| **BALTIMORE** | 24005 | BALT | MDC | 56 | 56 | 60 | 210 | 211 | 212 | | |
| **HARFORD** | 24025 | HARF | MDC | 64 | 64 | 68 | 210 | 211 | | | |
| **MONTGOMERY** | 24031 | MONT | MDC | 72 | 72 | 76 | 207 | 208 | 209 | 217 | |
| **HOWARD** | 24027 | HOWA | MDC | 80 | 80 | 84 | 207 | 208 | 210 | 211 | 217 |
| **PRINCE GEORGE'S** | 24033 | PGC | MDC | 88 | 88 | 92 | 206 | 207 | 209 | | |
| **ANNE ARUNDEL** | 24003 | ANNE | MDC | 96 | 96 | 100 | 207 | 210 | 211 | 212 | 214 |
| ***BGP*** | | | **MDC** | **104** | **104** | **108** | | | | | |
| ***BGP*** | | | **MDC** | **112** | **112** | **116** | | | | | |
| ***BGP* D.C.** | **11001** | **DC** | **MDC** | **120** | **120** | **124** | **200** | **202** | **203** | **205** | |
| ***BGP*** | | | **MDC** | **128** | **128** | **132** | | | | | |
| ***BGP*** | | | **MDC** | **136** | **136** | **140** | | | | | |
| ***BGP*** | | | **MDC** | **144** | **144** | **148** | | | | | |
| **CECIL** | 24015 | CECI | MDC | 152 | 152 | 156 | 219 | | | | |
| **KENT** | 24029 | KENT | MDC | 160 | 160 | 164 | 216 | | | | |
| **QUEEN ANNE'S** | 24035 | QUEE | MDC | 168 | 168 | 172 | 216 | | | | |
| **TALBOT** | 24041 | TALB | MDC | 176 | 176 | 180 | 216 | | | | |
| **CALVERT** | 24009 | CALV | MDC | 184 | 184 | 188 | 206 | 207 | | | |
| **CHARLES** | 24017 | CHAR | MDC | 192 | 192 | 196 | 206 | | | | |
| **ST. MARY'S** | 24037 | SMAR | MDC | 200 | 200 | 204 | 206 | | | | |
| ***BGP*** | | | **MDC** | **208** | **208** | **212** | | | | | |
| **CAROLINE** | 24011 | CARO | MDC | 216 | 216 | 220 | 216 | | | | |
| **DORCHESTER** | 24019 | DORC | MDC | 224 | 224 | 228 | 216 | 218 | | | |
| **WICOMICO** | 24045 | WICO | MDC | 232 | 232 | 236 | 218 | | | | |
| **SOMERSET** | 24039 | SOME | MDC | 240 | 240 | 244 | 218 | | | | |
| **WORCESTER** | 24047 | WORC | MDC | 248 | 248 | 252 | 218 | | | | |