

ARDC 44Net Assessment Results

Prepared for



Prepared by



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Project Outline

Background

[Amateur Radio Digital Communications](#) (ARDC) is a private foundation that exists to support amateur radio - specifically around digital communication, science, and technology. Since its allocation in the mid-1980's, the network consisting of IP address space 44 (44.0.0.0/8), known as the AMPRNet (and sometimes also as 44Net), has been used by amateur radio operators to conduct scientific research and to experiment with digital communications over radio with the goal of advancing the state of the art of Amateur Radio networking, and to educate amateur radio operators in these techniques. In mid-2019 a block of (44.192.0.0/10) of approximately four million IP addresses out of 16 million was sold to create an endowment for ARDC. The remaining 12 million IP addresses (44.0.0.0/9 and 44.128.0.0/10) retained by ARDC are allocated exclusively for amateur radio use.

In early 2022, ARDC contracted with Two P to answer a primary question around *How are 44Net resources being utilized?* This led to the development of a survey, multiple focus group meetings, and community engagement - such as presentations at ARDC community meetings. The survey also for the first time, attempted to capture demographics on the ARDC user community. The intention of this document is to report on 44Net usage, characterize users (*and their underlying applications or services*), ARDC's stewardship of 44Net, and present overall survey results. At the request of ARDC staff, a separate document will outline tactical and thematic recommendations for the ARDC board to consider. ARDC will ultimately choose the distribution of these recommendations and development of a 44Net roadmap for the future.

History

The initial 44/8 allocation occurred in 1981, where the block size was 16.7 million IP addresses. At this time, the internet was not a global sensation with wide adoption - but still in an academic and research infancy. Thus large IP addresses blocks weren't viewed as a scarce resource, as they are now in the 2020s.

Originally this block was subnetted or divided for various countries and states/provinces primarily as /16 blocks or 65,536 addresses. Local IP address coordinators would assign a single address or smaller subnet of addresses to applicants. This helped distribute some of the administrative overhead. Early usage was experimenting with Internet Protocol encapsulation, such as AX.25 using NOS (KA9Q). This usage was mostly isolated from the public Internet, as gateways were few and far between. This radio traffic was typically exchanged between 2m and 70cm stations that were geographically local.

With the knowledge of IPv4 address space exhaustion, and the interest in providing public Internet access to the amateur community, the 44/8 address space was advertised to the Internet via BGP to UCSD. IPIP tunnels were created and supported by the router at UCSD to provide Internet access for those not directly connected to the router. During Brian Kantor's

stewardship, smaller prefixes of 44/8 were authorized to be announced outside of the 44/8 (now 44/9 and 44.128/10) announcement at UCSD.

As the /16 delegations by state/country could be lightly used and with the adjacent /16 spare blocks that are interspersed with the delegated blocks, there is concern that the 44Net space could be consolidated to be more efficient in its deployment. ARDC's own TAC (*Technical Advisory Committee*) has performed low fidelity studies of the existing allocation scheme and has proposed ways to reallocate in a more efficient manner. ARDC staff has also implemented changes to the allocate scheme, such as a dedicated global BGP subnet - regardless of geographical location. Wikipedia has additional historical dates and milestones of 44Net, under the [AMPRnet](#) article.

A robust and competitive marketplace exists for IPv4 resources - where the vast [majority were exhausted between 2011 to 2019](#). Interest in amateur microwave networks has peaked during the COVID-19 pandemic, where turnkey projects like [AREDN](#) have provided a pre-packaged mesh network stack using commodity surplus hardware. This has significantly lowered the barrier for licensed amateur radio operators to build and scale large IP microwave networks, where historically custom hardware/software was a prerequisite. In many ways, this makes the 44Net resource valuable to a new generation of operators and projects.

ARDC is in a very unique operational position, retaining a significant IPv4 resource - effectively acting as a de facto Routing Internet Registry (RIR) such as ARIN or RIPE. However, ARDC doesn't have formal members, dues, annual public meetings, or other mechanics that are routine with RIRs. The governance of 44Net is shared between the ARDC board, ARDC staff, regional coordinators, Technical Advisory Committee (TAC), and the global user community - which mostly engages over a mailing list. ARDC is at a crossroads: in addition to focusing on grants, do they maintain 44Net in its current state, or do they further invest in the operational support of 44Net?

Survey

Overview

Two P collaborated with ARDC staff to develop a survey in early 2022. This involved several meetings to solicit questions, increasing with fidelity over time. The broad survey areas include: respondents demographics, how 44Net is technically consumed, what applications or services are being offered, how ARDC could improve the user experience, feedback on regional coordinator interactions, and feedback on future improvements.

The survey opened on May 31st, 2022 and closed on July 5th, 2022 - a total of 1766 responses were collected for the survey. 203 responses were removed due to responding to an insufficient number of questions (*i.e., they did not pass a certain point of the survey*). 1 response was removed due to clear duplication (*identified by the duplicate email address that was optionally*

shared by the respondent at the end of the survey). 1562 responses were used for the presented survey data in this document and analysis exercises.

The survey utilized branching logic to segment respondents as current licensed amateur radio operators and/or if a respondent has received an 44Net allocation - either past or current. The intent of the branching was to keep the survey relevant to respondents' knowledge and experience with 44Net. There was some initial concern that non-amateur radio respondents may skew or overload the survey data, however 99% of the respondents were licensed amateur radio operators. Response quality (*auto detected suspected bots, spammers, etc.*) per Qualtrics was estimated at 99%.

Methodology

The survey was qualitative, and utilized single choice (*only one answer could be selected*), multi choice (*more than one answer could be selected*), and open-ended (*free-form text box*) response options in a variety of configurations. This was done to maximize the quality and diversity of responses collected; qualitative work at this scale is cost and time prohibitive.

Survey design was done collaboratively between Two P and ARDC staff in a series of working meetings over Zoom. ARDC staff chose an established enterprise grade survey suite (*Qualtrics*) to support the question development, survey logic, data collection, and report filtering necessary for this project.

ARDC staff advertised the survey with a short URL on major social platforms (*Twitter, Facebook*), along with 44Net specific communities - such as the [44Net mailing list](#) and ARDC newsletter (*May 2022 issue*). Several members of the TAC also solicited their regional communities to participate. ARDC also advertised the survey at in-person events, such as Hamvention.

Data analysis included:

- Two P identified and removed duplicate or incomplete data, with support of ARDC staff.
- ARDC staff was given access to all of Two P's analysis documents in full transparency of the analysis and report process.
- ARDC staff handled both the survey question and respondent translation to/from English.
- ARDC staff remove personal identifiable data in a manual process, generally focusing on free-form text response fields - which often leaked call signs, club, and or personal names.
- Two P exported Qualtrics data as a CSV file into Google Sheets to "code" free form textual responses as best as possible to match the set responses and/or establish new response categories as made sense.
- Two P exported aggregated responses from Qualtrics for charting in this final report, to accompany written analysis.

- No advanced statistical analysis has been performed on the data.

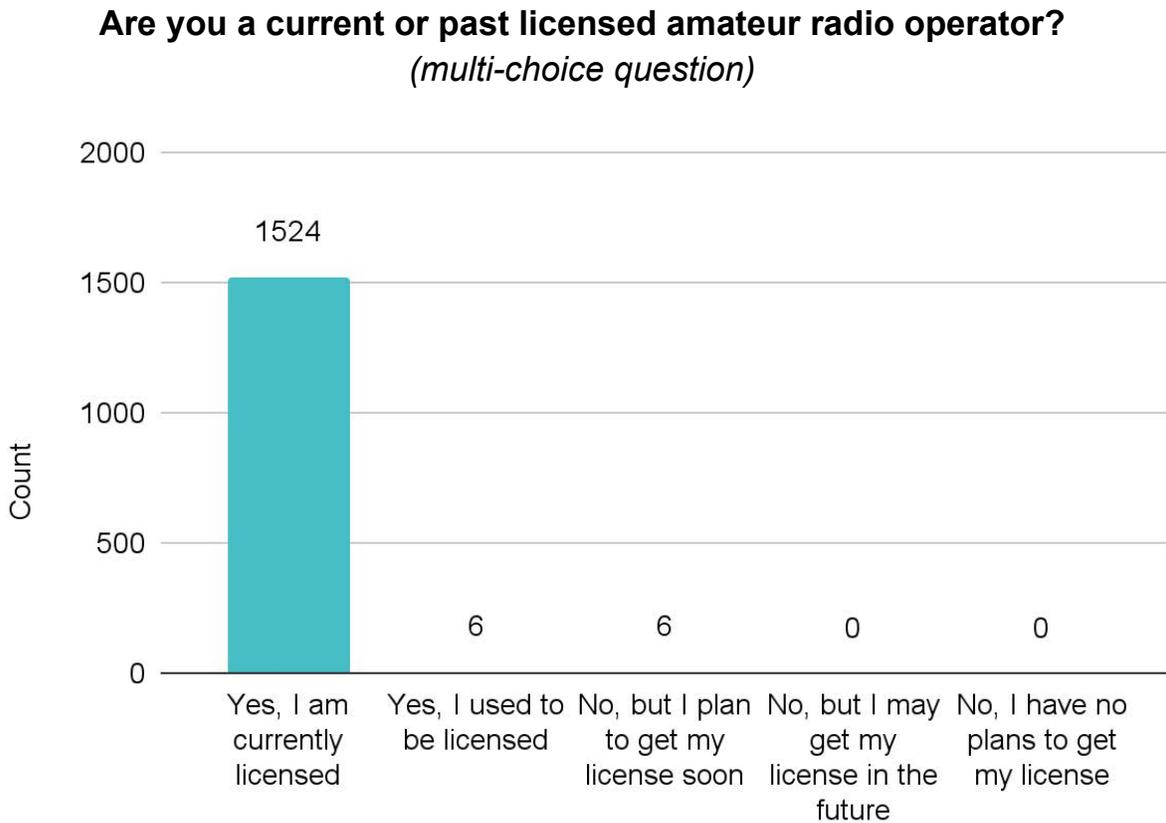
Caveats

The survey had only 1 required question (*which drove branching logic*), no participation criteria (*demographics weren't utilized as a qualification screening*), no monetary or other incentive was offered, and the targeted survey duration was under 15 minutes. Additional caveats include:

- The survey had no requirements or restrictions around demographics for completing the survey, so the demographics of respondents heavily skewed towards dominant groups (country, gender, race, age)
- The data is only representative of the sample that was reached and chose to respond – not necessarily the amateur radio community at large
- Nearly every question was optional (except for one), so numbers of responses may differ even amongst questions that everyone received
 - Many questions were also multiple choice, which means people may have responded by selecting multiple answer options
- Most of the multiple choice questions had an option to select "other" and to provide a text response. Quite often the text response matched one or more of the options above.
- Some respondents gave what appeared to be bad faith responses to the optional demographic questions at the end (in particular where "other" options were allowed)
- Since the majority of questions were not required, "prefer not to answer" responses are not charted

Amateur Radio and You

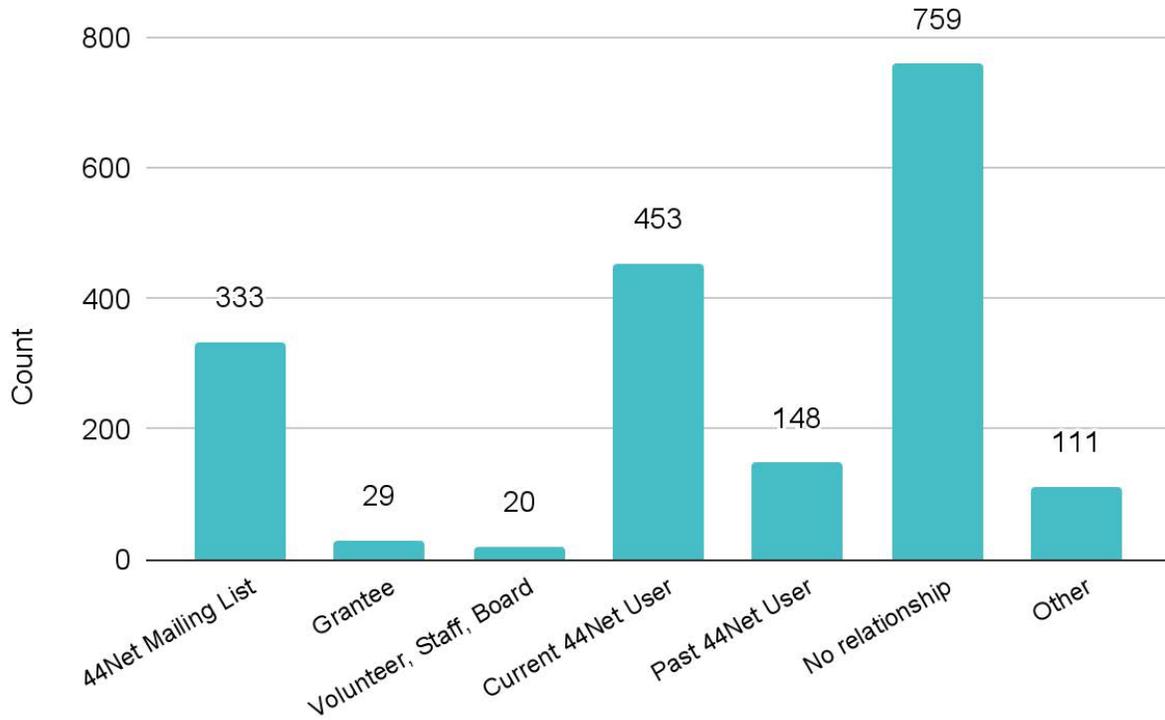
Q9a - Licensed Status



99% of respondents are active amateur license holders. A breakdown of license types wasn't collected, as each country has slightly different tiers and operating privileges. Originally some initial concern existed around the survey being skewed or overwhelmed with non amateur operators, but that did not unfold. The concern would be around IPv4 industry individuals, such as brokers of IPv4 resources - which have an alternative motivation for the 44Net stewardship in the future.

Q12 - Relationship w/ ARDC and/or 44Net

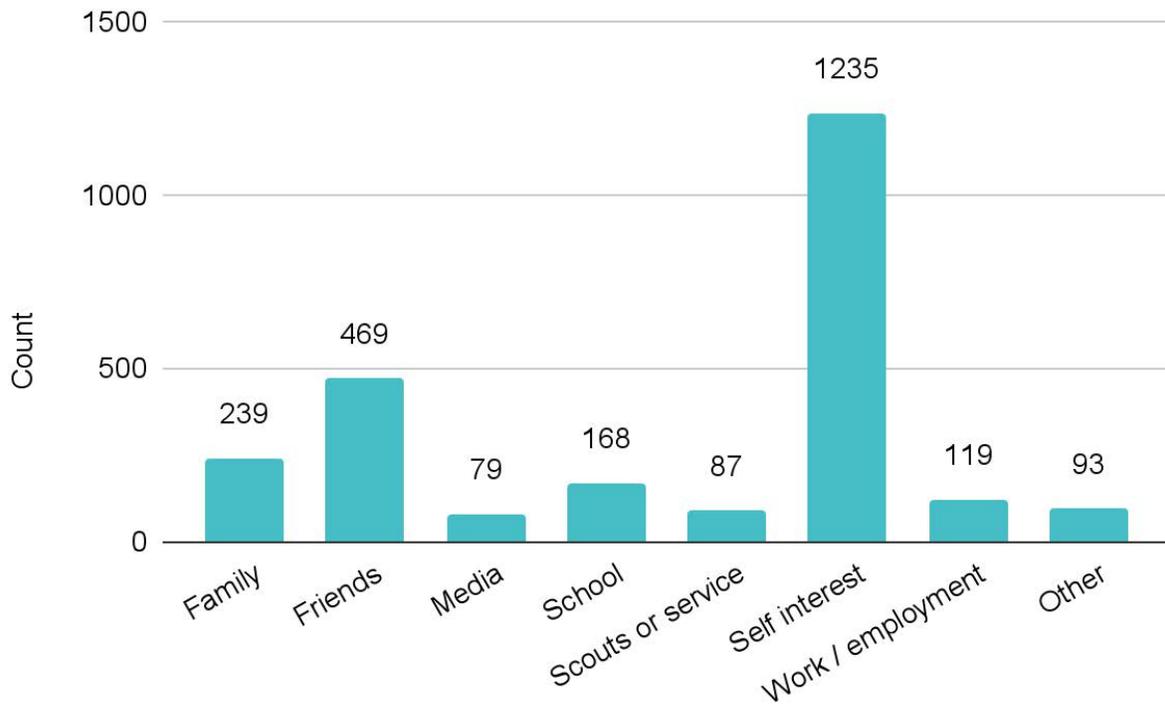
What is your relationship to ARDC / 44Net? (multi-choice question)



The survey reached many amateur communities with limited to no involvement with ARDC and/or 44Net.

Q9b - Intro to Amateur Radio

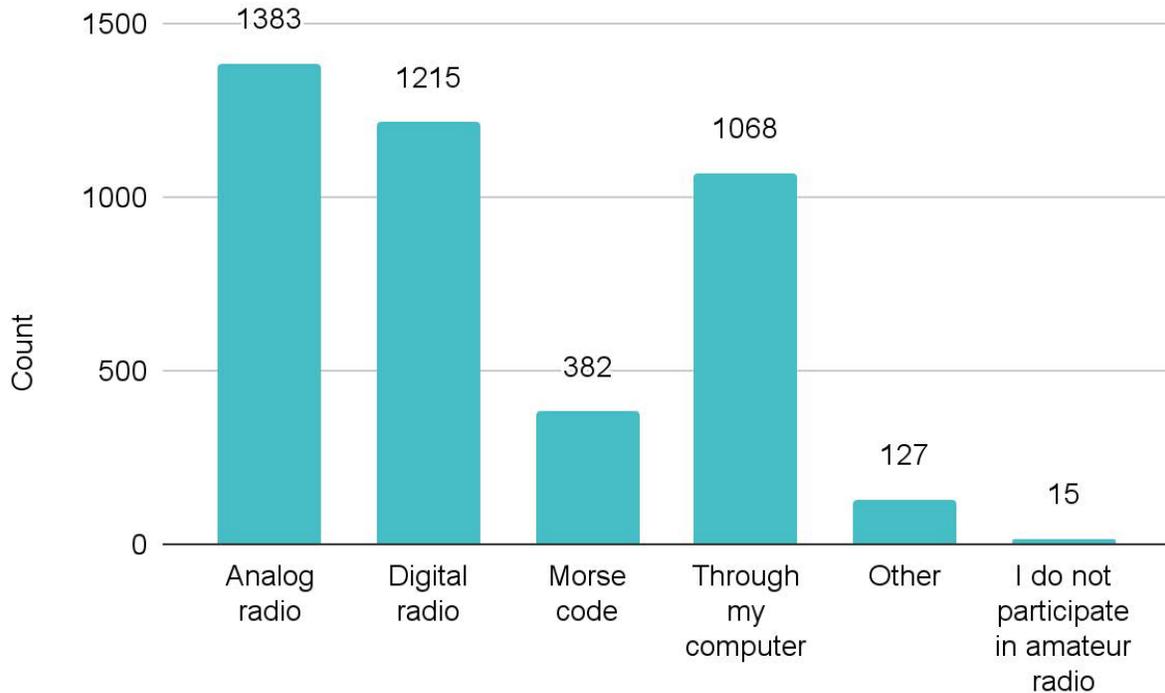
How did you get introduced to amateur radio?
(multi-choice question)



Operators are overwhelmingly self-interested in the hobby, often getting introduced through family or friends.

Q43a - Modes

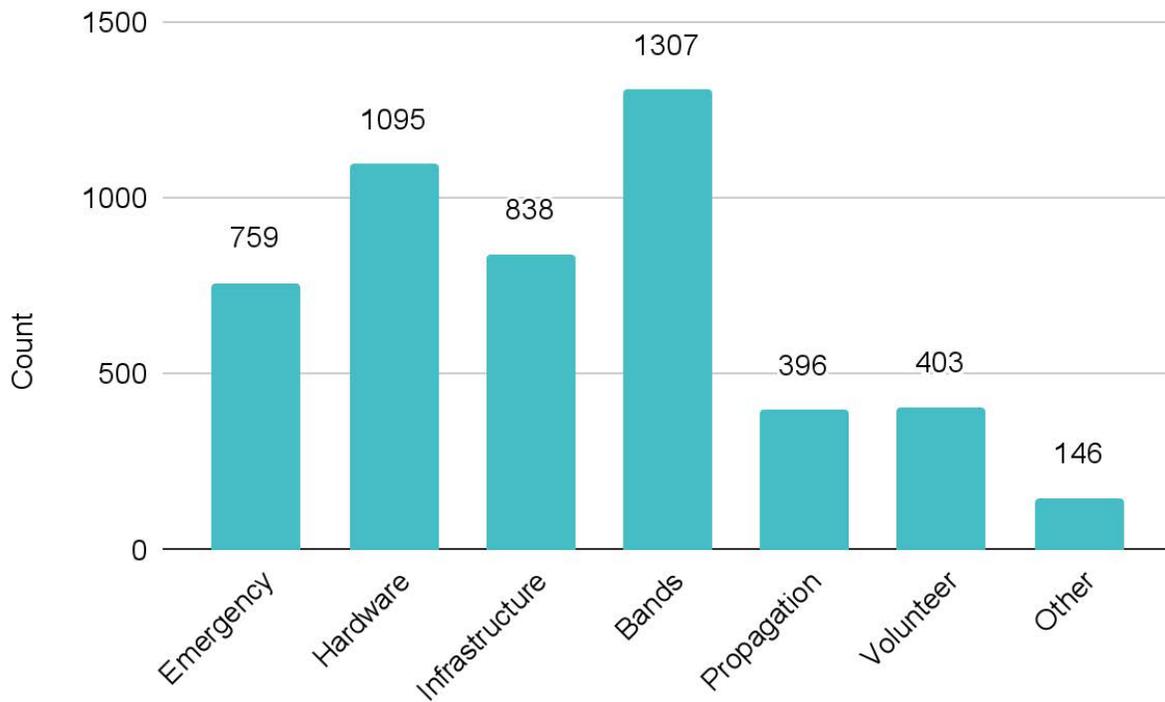
When you participate in amateur radio, what modes do you typically use?
(multi-choice question)



Analog radio such as VHF voice FM - is unsurprisingly the dominant operating mode, as this is the minimum licensing privilege. This ecosystem is well developed in training materials, several equipment manufactures/suppliers, is broadly legal worldwide, and fairly easy to start with (e.g.: plentiful *Eelmers* or experienced operators willing to train new amateur radio operators with analog FM transceivers).

Q10 - Radio Activities

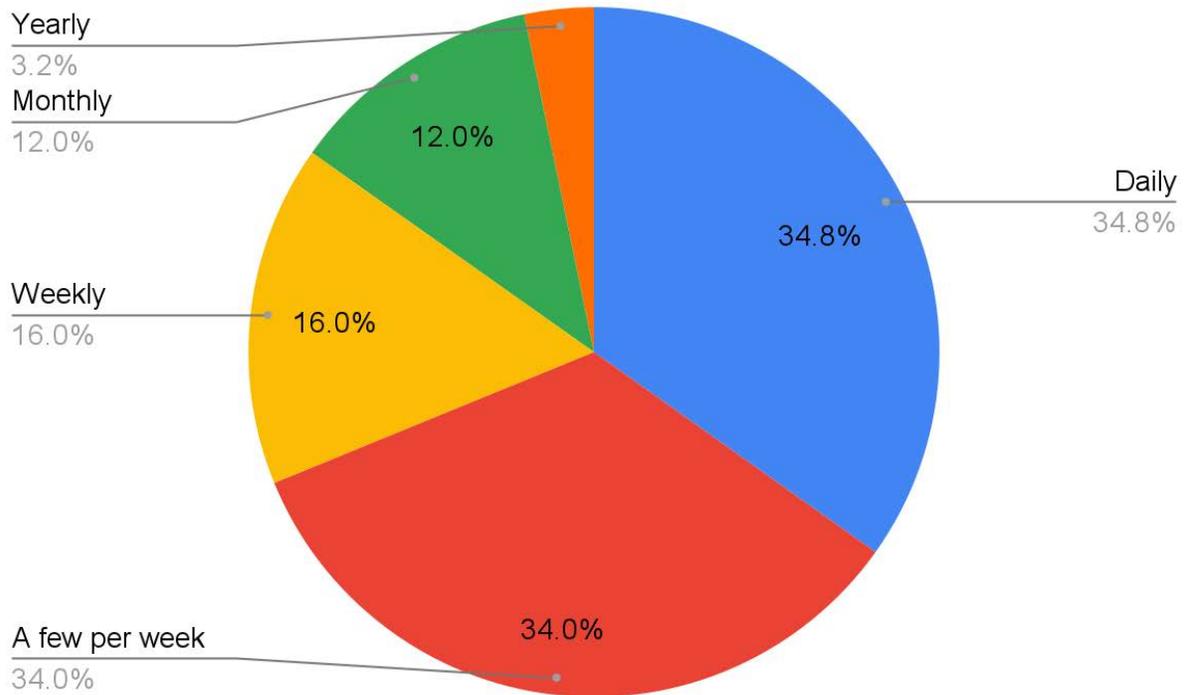
Which of these amateur radio activities are you interested in or participate in?
(multi-choice question)



The dominant operating mode is categorized by UHF/VHF (*primarily voice with some packet/data*), HF (*High frequency - operating between 3 to 30MHz, mixture of voice/packet*), DX'ing (receiving and identifying distant signals). Hardware prototyping & antenna are a close second activity (*within the "Hardware" sub category*), which speaks to the amateur radio roots of experimentation.

Q11 - Frequency of Radio Activities

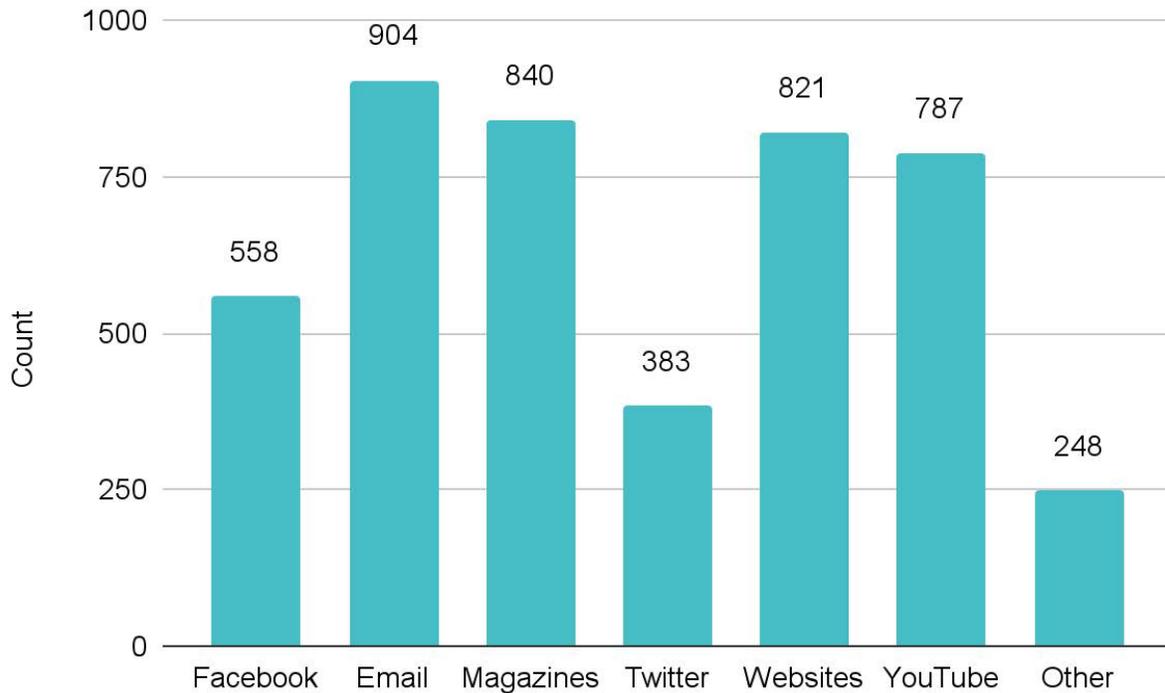
How often do you participate in amateur radio programs / activities?
(single-choice question)



Operators are active, and just over half participate in amateur radio activities at least once a week - likely for scheduled programs, such as repeater nets.

Q8 - News/Community Engagement Sources

Where do you receive or interact with amateur radio community news or media? This might include websites you visit, newsletters you might subscribe to, or social media you follow.
(multi-choice question)

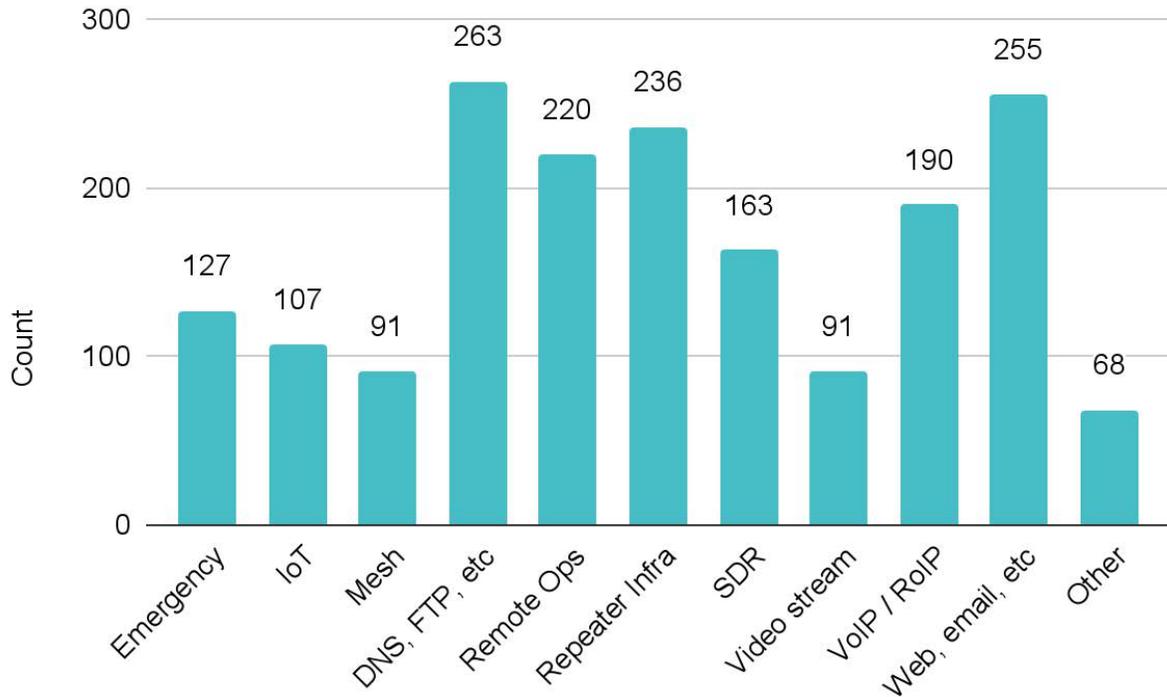


Operators receive media in traditional analog (*print media*) and diverse online media formats. Email is the dominant form of news or community engagement, followed by magazines (*QST was widely cited*). Websites were spread across ham-focused sites such as QRZ.com, club/associations, and broad format discussion sites - such as Reddit.

AMPRnet/44Net Applications & Services

Q17 - Categorization of Applications and/or Services

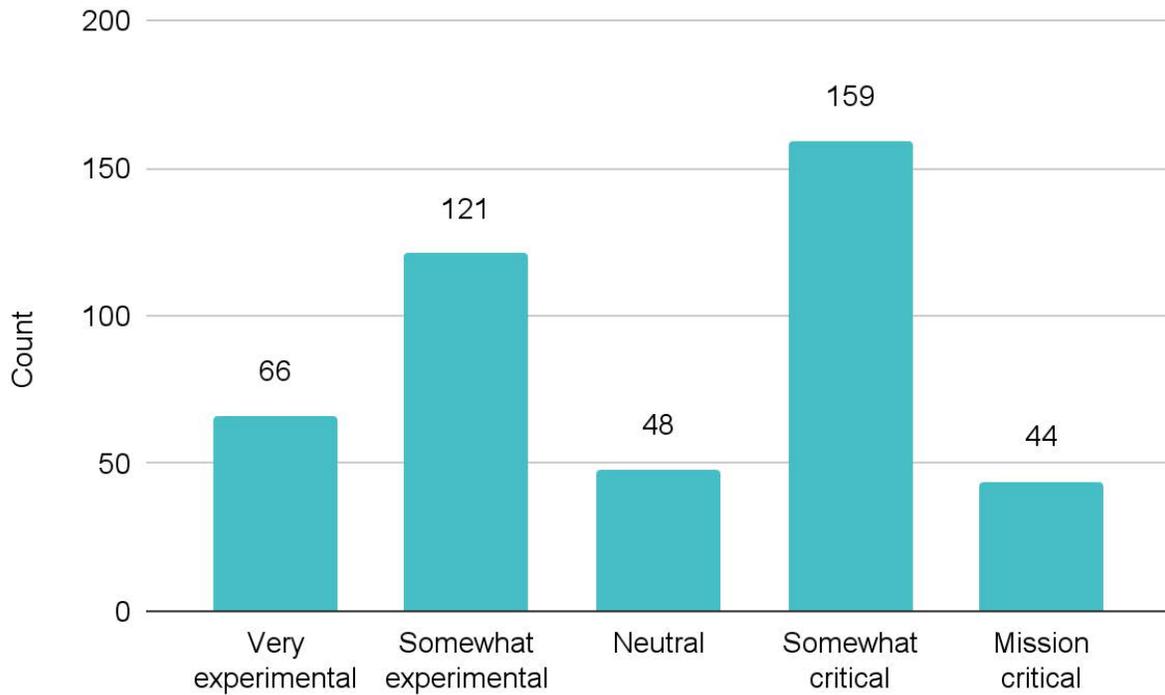
What applications or services are you running on your 44Net prefix(es)?
(multi-choice question)



Most services offered are traditional IP core protocols - such as HTTP, SMTP, DNS, FTP, etc. Supporting repeater infrastructure - such as remote control, firmware upgrades, monitoring, etc. - was a close second popular usage. A much smaller subset of applications could function without the greater Internet connectivity, such as chat or video streaming applications which assumed LAN-only connectivity.

Q27 - Reliability of 44Net apps/services

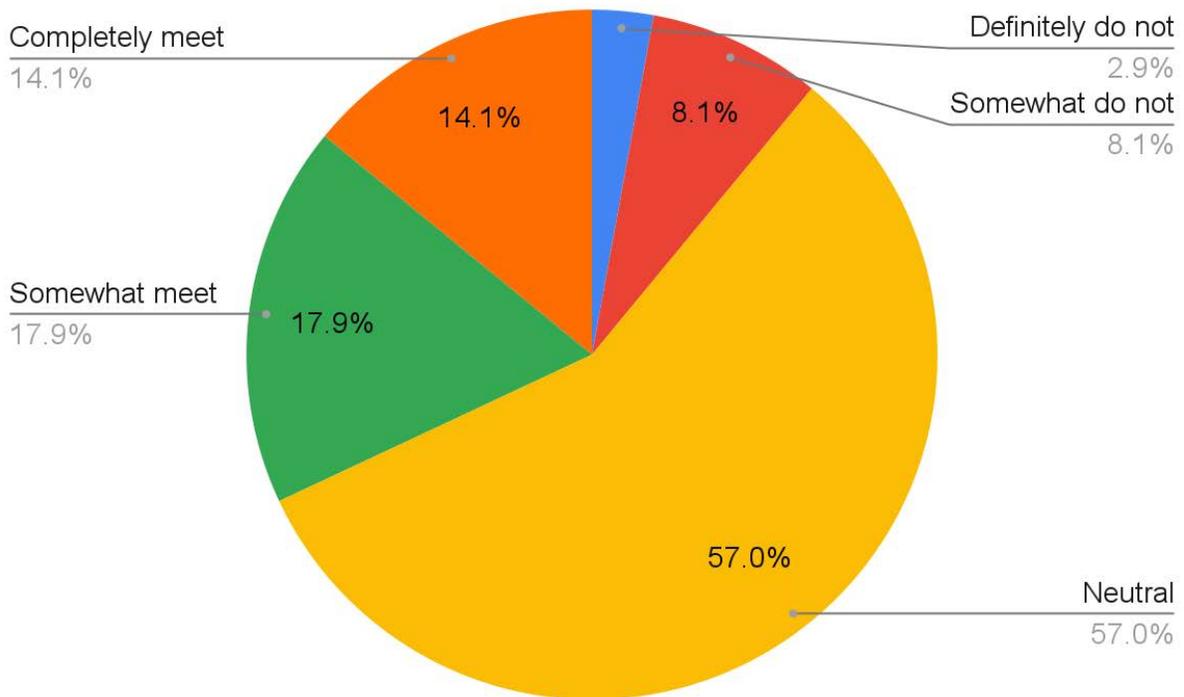
How would you describe your 44Net applications and / or infrastructure?
(single-choice question)



The vast majority of users are operating experimental or “somewhat critical” level applications that would allow for the continued support level. An updated SLA (service level agreement) was not broadly requested.

Q28 - ARDC policies

Do the current ARDC policies meet your needs for your applications and / or infrastructure?
(single-choice question)



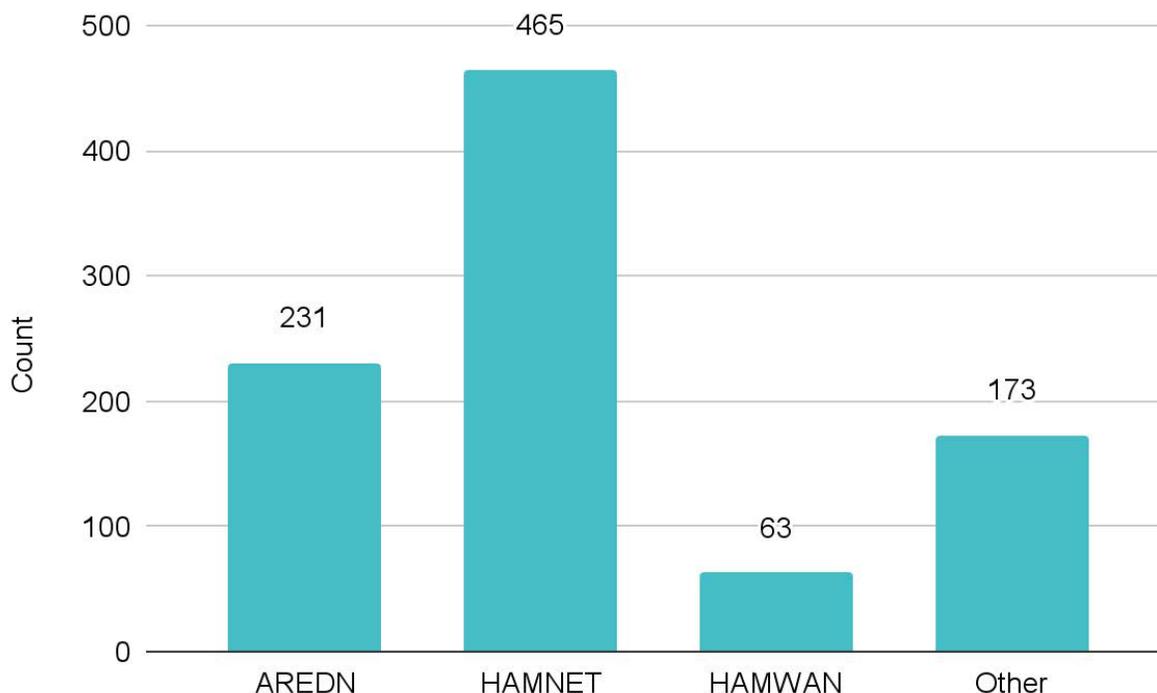
Q18 - Apps/Services not compatible with 44Net

Do you have any applications or services that you'd like to use 44Net for but that aren't currently compatible or allowed?
(open-ended question)

Operators primarily cited a concern for operating encrypted (e.g.: *HTTPS, SMTP, DNS over HTTPS*) protocols over their 44Net infrastructure. As many of these applications have a security-by-default design in the modern Internet, encryption is a valid concern to meet amateur radio government rules; which "*forbid encryption to obscure the meaning of communications.*" Note this applies to amateur traffic over RF links, not necessarily IP.

Q44 - Network Participation

Do you participate in any of these amateur radio networks? (multi-choice question)



[HAMNET](#) (*Highspeed Amateur Multimedia NETwork*) is a private (*non-Internet connected*) network primarily operating in Germany and adjacent European countries. Their use of 44Net is for unique private IP space over multiple countries, in theory [RFC1918](#) Private IP or [RFC6598](#) CG-NAT. Renumbering for this project would be a significant effort. Several native German respondents participated in the survey, illustrating the strong interest and support of the HAMNET's usage of 44Net IP allocations in a non-tunneled use case. Users within the Netherlands have different network policies, which aren't necessarily of private IP usage, but BGP global announcements.

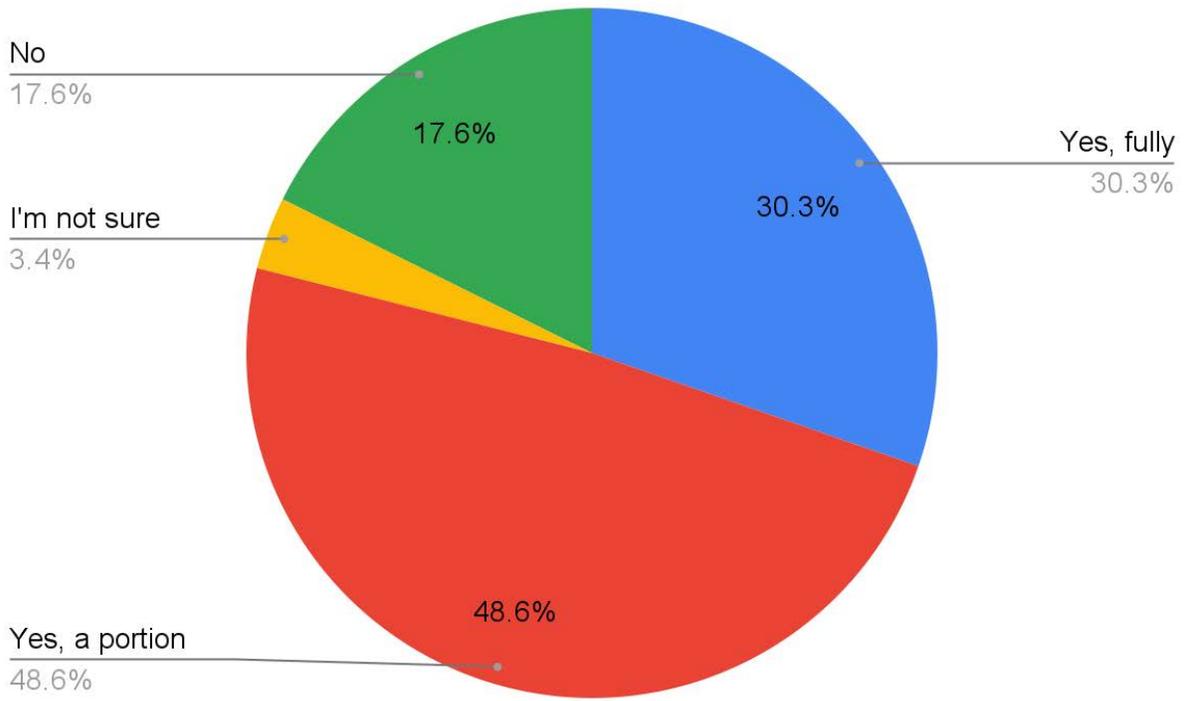
[AREDN](#) (*Amateur Radio Emergency Data Network*) is a simple to install mesh data network software package, which enables the rapid deployment of an IP network in amateur licensed spectrum. While the underlying technology, OLSR mesh + use of RFC6598 100.64.0.0/10 doesn't require 44Net IPv4 space - such allocations could be useful as large permanent mesh networks interconnect and thus would need unique IP space to peer with each other.

[HAMWAN](#) (*"A modern, multi-megabit, IP-based, digital network for amateur radio use!"*) is a routed network, with deployments throughout North America - primarily in the Puget Sound

(Seattle) area. These networks use off-the-shelf microwave radios (primarily Mikrotik) to operate in amateur radio bands, using 44Net IP space.

Q16 - 44Net RF usage

Does your use of 44Net use amateur radio frequency infrastructure?
(single-choice question)

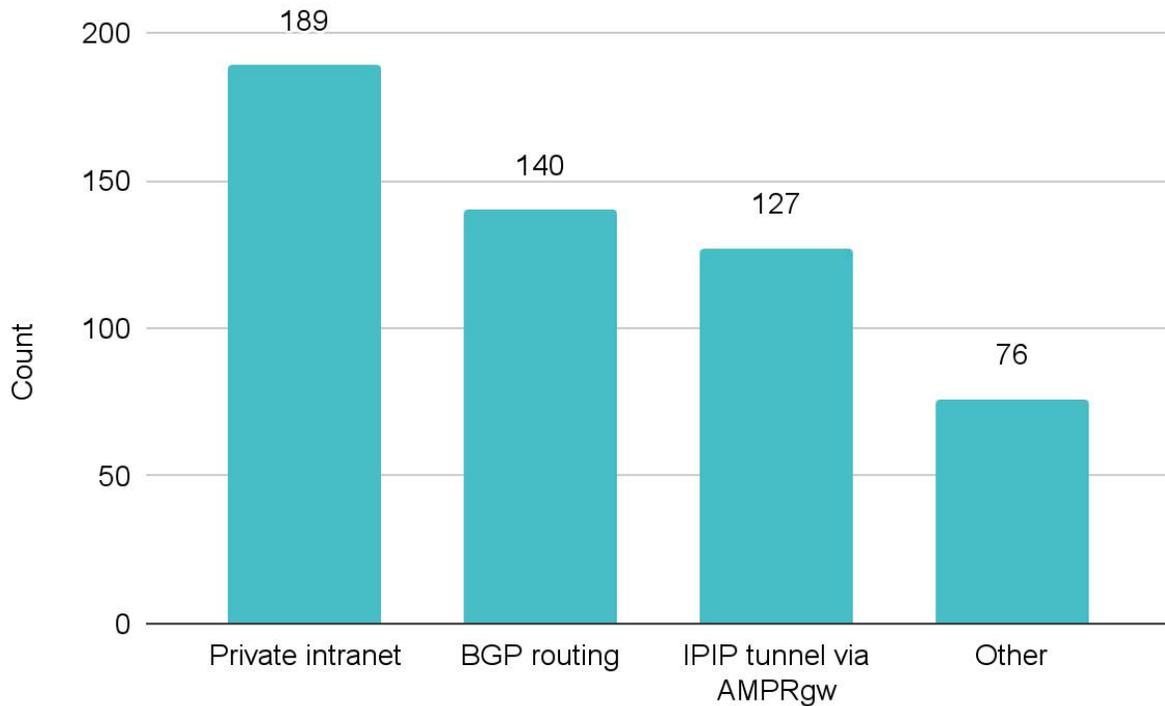


It's unclear how recent 44Net allocations - which involve a BGP-announced block originating or terminated to a rented VM/VPS (virtual machine/virtual private service) - utilize RF spectrum. It's possible that these servers have additional tunnels that run over amateur radio spectrum.

Routing & BGP

Q14 - Use of Allocated Address Space

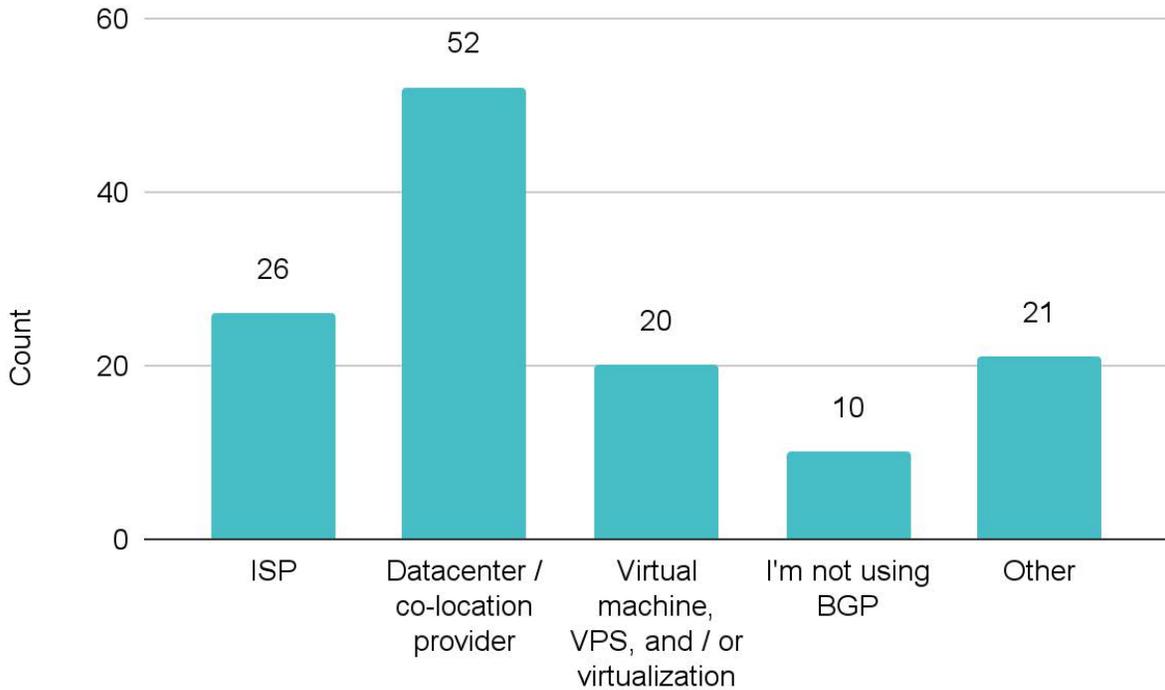
How are you using your allocated address space?
(multi-choice question)



The “other” respondents appeared to be confused by the answer options, as all of the other respondents fell into the 3 offered answers - direct BGP announcement, tunnel, and/or private usage not on the global internet. Many of the respondents selected multiple answers, including the “other” free-form text field, a subset of which did not provide details on what they meant by “other.”

Q31 - Announcing 44net BGP IP prefix(es)

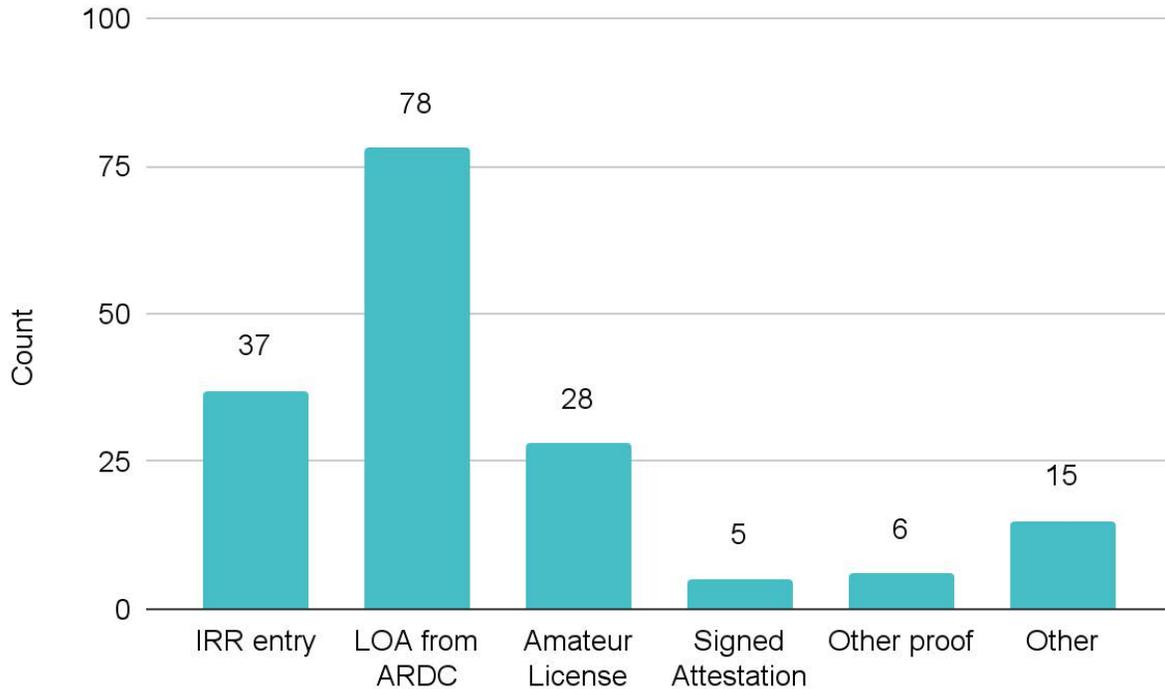
What infrastructure announces your 44Net BGP IP prefix(es)? (multi-choice question)



The “other” respondents either did not have in-depth knowledge of how their routing occurred or this was sponsored by a local university (*effectively acting as a co-lo or VPS provider*).

Q32 - Required Routing Validation

What routing validation was required from your provider(s) to announce your 44Net prefix(es)?
(multi-choice question)



New or modified routing on the global Internet generally requires an administrative record of authorization. Historically this has been a mixture of both paper and/or digital records.

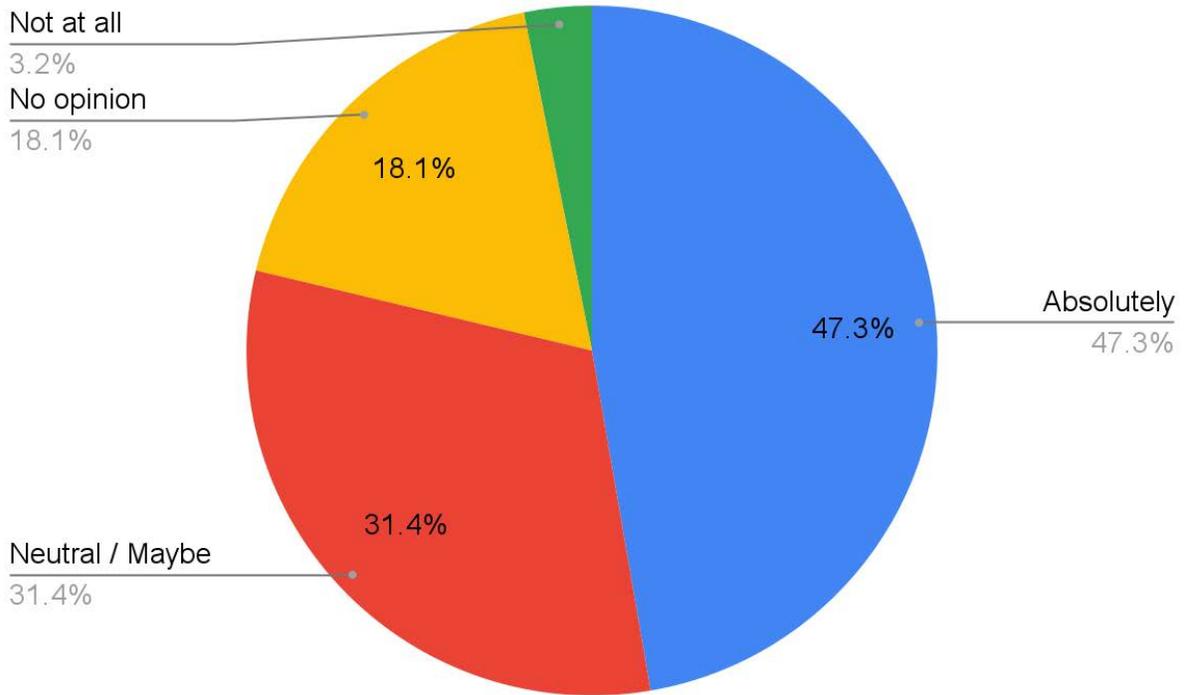
LOA's (*letter of authorization*) is generally a letterhead document which states that an organization or entity grants permission for an IP block to be announced. These serve as a formal record, but are not notarized or authenticated in any way - where the letterhead logo + signature are seen as sufficient .

Some RIRs will require a signed attestation from an executive or board member of an organization, to prove that high levels of the entity are aware of permissible use of their IP block(s).

IRRs (*internet routing registry*) operate as a digital record of expected routing announcements, these are used in automated systems to generate firewall or block/allowed lists of prefix(es) from specific origin AS numbers.

Q33 - Adopting Routing Standards

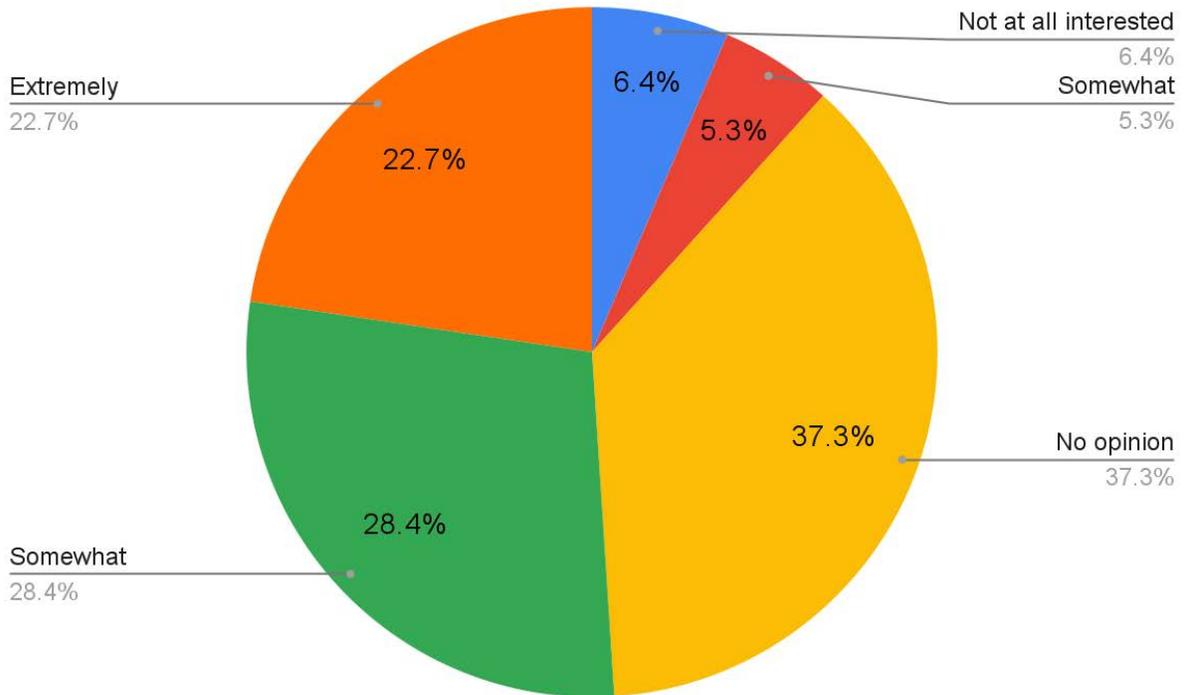
As a user of 44Net address space, I would encourage ARDC to adopt routing standards that allow 44Net to continue to operate on the global Internet.
(single-choice question)



The intent of this question was to confirm that users felt participation in typical RIR duties - such as RPKI, reverse DNS, IRR, whois, etc. - was supported, without specifying the exact administrative configuration of such duties (e.g. join an existing RIR, operate a standalone RIR, etc).

Q35 - Interest in Joining RIR

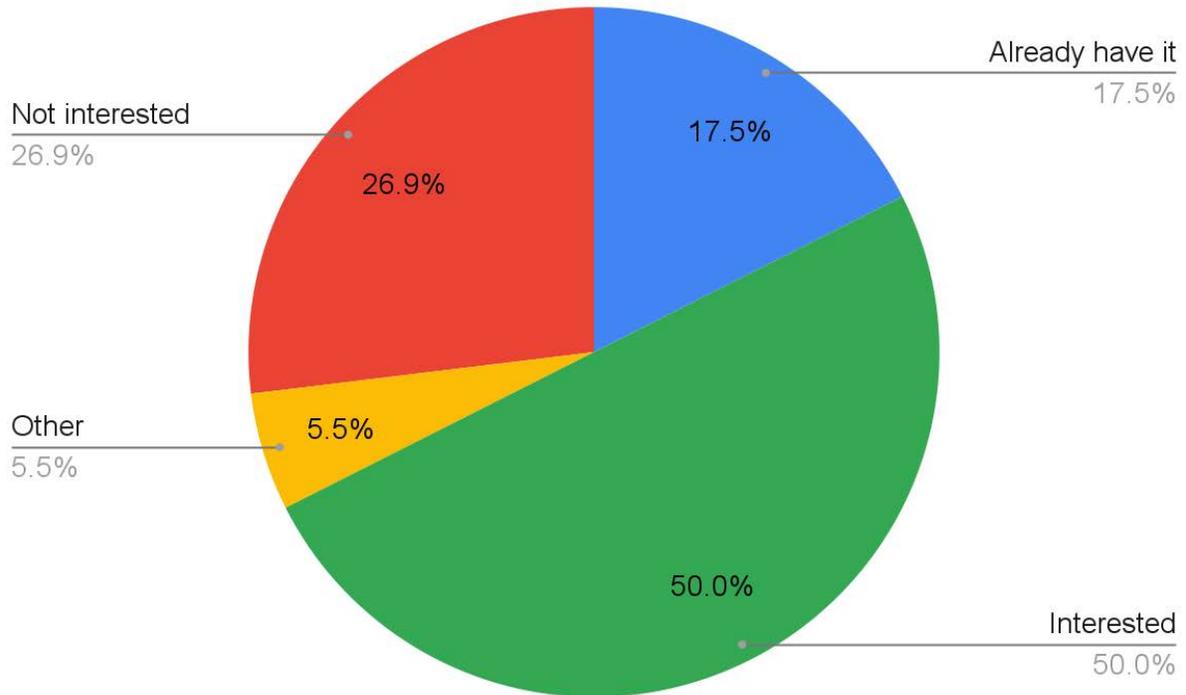
How interested would you be in ARDC joining a RIR? (single-choice question)



As a follow-up to the last Q33, this question offered a more granular path to participating in the typical global RIR ecosystem without specifying the duties associated with such enhanced stewardship.

Q19 - Interest in IPv6

What is your interest in IPv6 in reference to AMPRNet? (single-choice question)



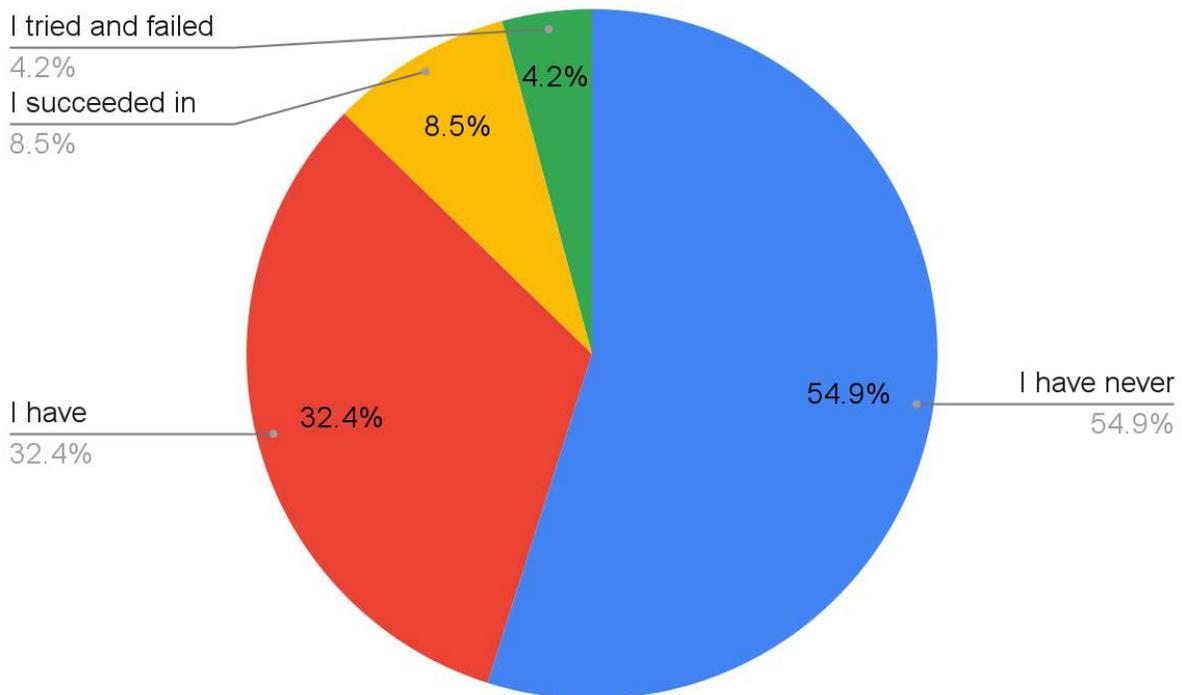
IPv6 was generally discussed as a future or experimental effort; those that had tactical v6 examples had already secured allocations from an existing RIR and/or their own service provider(s).

IPv6 did however bring up a large theme that many amateur software / hardware does not natively support IPv6. This is a prerequisite problem to the question of whether ARDC provides such allocations in the future.

ARDC facilitation of AMPRnet

Q13 - Experience for IP allocation

What has been your experience with trying to get an IP address space allocation from ARDC / 44Net or use it for your intended purpose(s)?
(single-choice question)



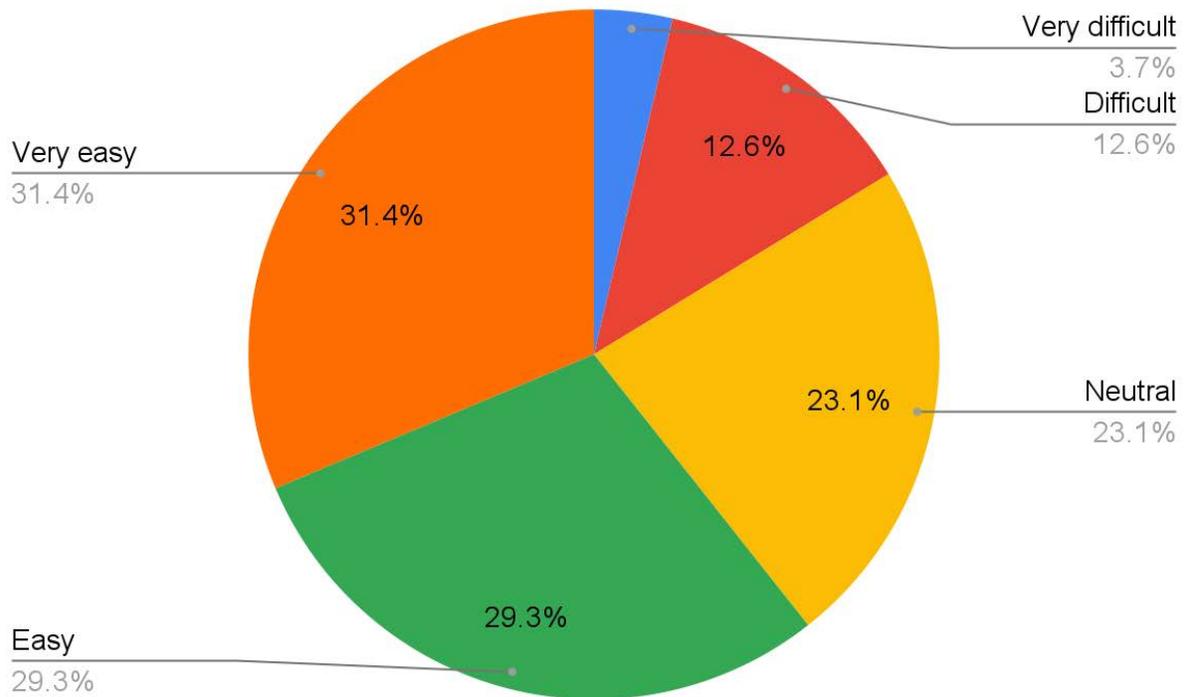
The labels are cut off on the above graph. Here's what they refer to:

- I tried and failed to get an IP address space allocation
- I succeeded in getting an IP address space allocation, but I failed to be able to use it for my intended purpose(s)
- I have succeeded in both getting an IP address space allocation AND have been able to use it for my intended purpose(s)
- I have never used or tried to use 44Net

Overall, most people who tried to get an IP address allocation and use it for their intended purpose succeeded. However, a significant portion of people tried and failed. In text replies, they often cited a lack of documentation, lack of technical know-how, or trouble working with their regional coordinator as reasons for the failure.

Q23 - Ease of Allocation Experience

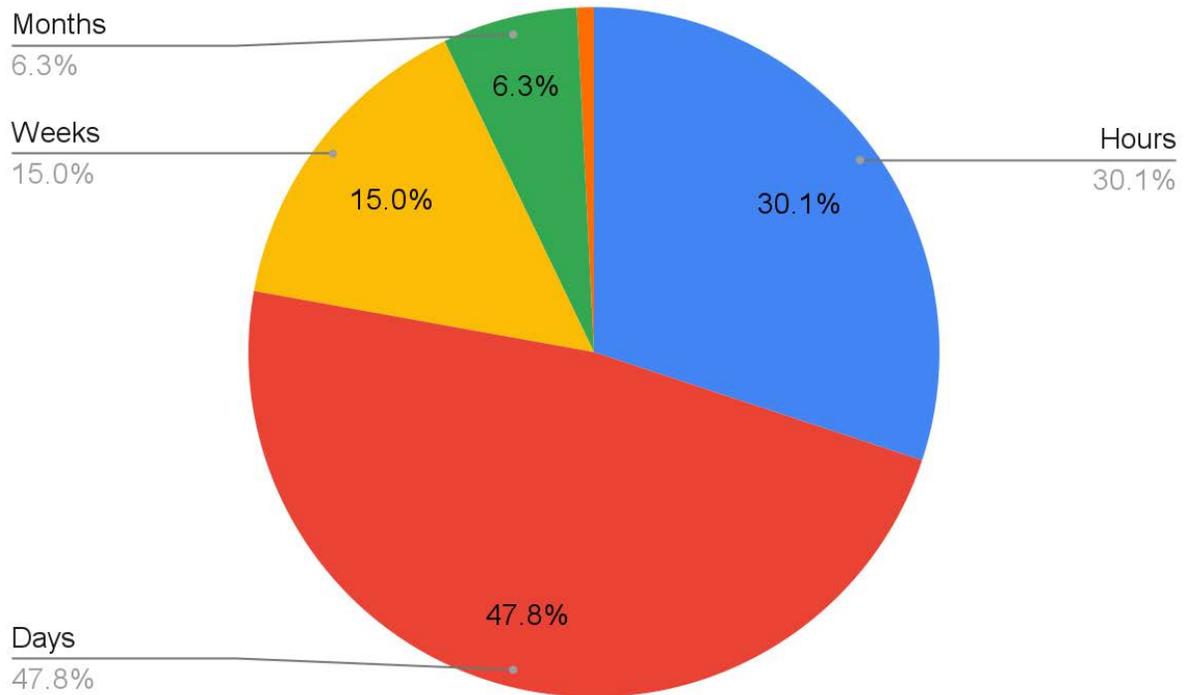
How would you rate the ease of your experience getting your 44Net IPv4 allocation?
(single-choice question)



Respondents were varied here - experienced IP network engineers asking for allocations at a global scale often, in their words, "sailed through," while less experienced operators working with a regional coordinate would often run into what they referred to as "power play" situations. These outcomes weren't always consistent, as some coordinators have taken a mentorship approach to allocations and some global allocations ended up not being used in an amateur radio context.

Q21 - Time for Allocation Processing

About how long did it take for your allocation request to be processed?
(single-choice question)

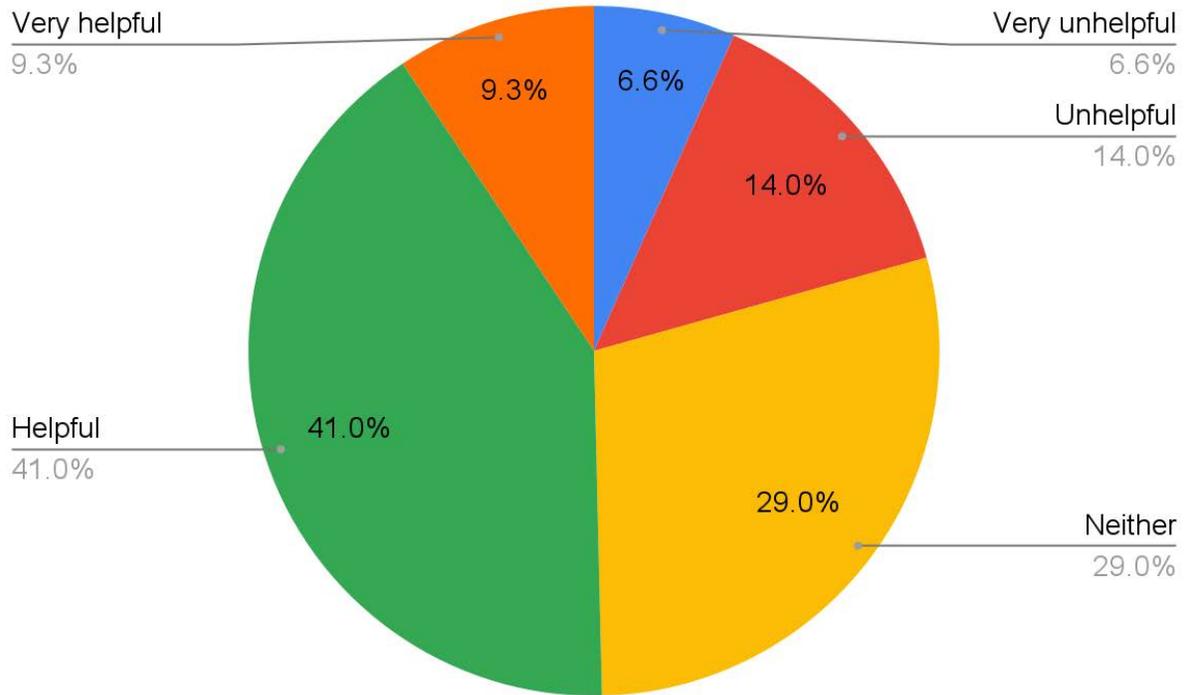


AMPRNet / 44Net beats many traditional RIR allocation timelines, which are normally measured in weeks or months. ARDC staff and regional coordinators should be proud that most allocations being completed within days.

That said, policies of legitimacy of allocations vary greatly between regional coordinators - the regional standards are not consistent. The more recent global allocations have focused on more broad usage and proof of a valid license held, while many older allocations required more detailed justification. To create consistency between policies (and/or a single, unified policy), it would be helpful to provide examples of uses that are clearly within valid scope, clearly out of scope, or which require additional justification.

Q25 - Current AMPRNet Documentation

How helpful is the current AMPRNet documentation? (single-choice question)

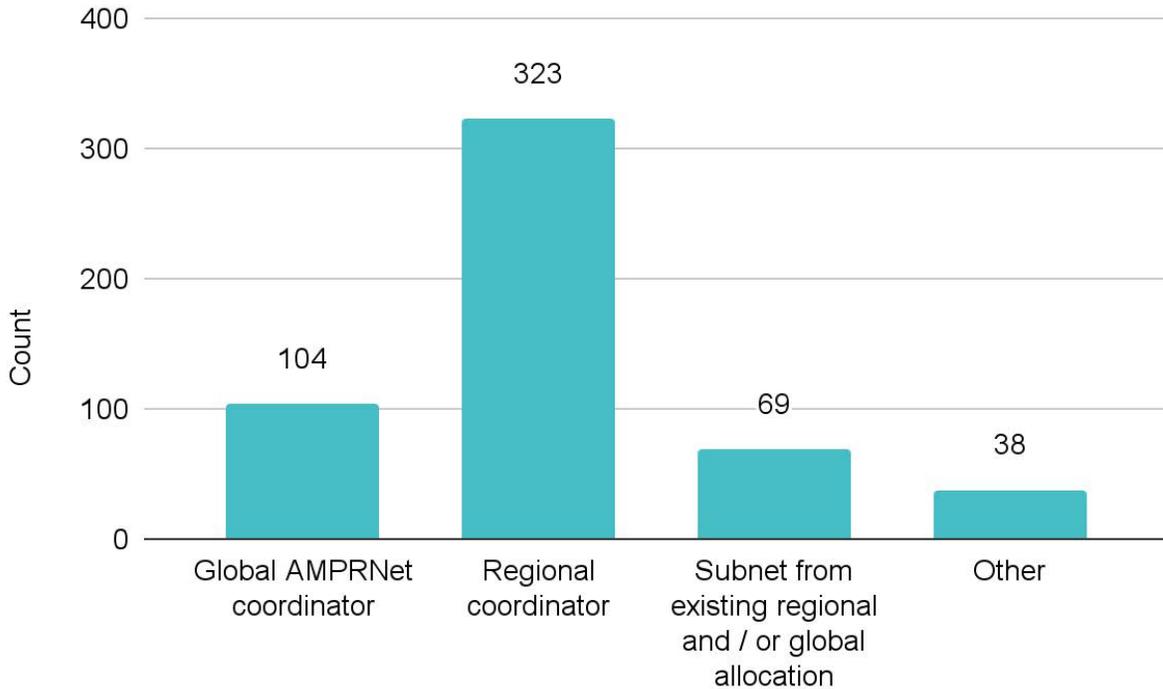


Respondents often pointed to the 44Net wiki and/or mailing lists as sources of the most useful documentation. Often developed regional projects depended on a "train-the-trainer" model, where only a subset of operators handled the 44Net-specific implementation and administrative details.

Much of the wiki and mailing list content do assume a high level of familiarity with IP routing, firewalling, Unix daemon/software operations, etc.

Q26 - Admin Contact(s) for Allocations

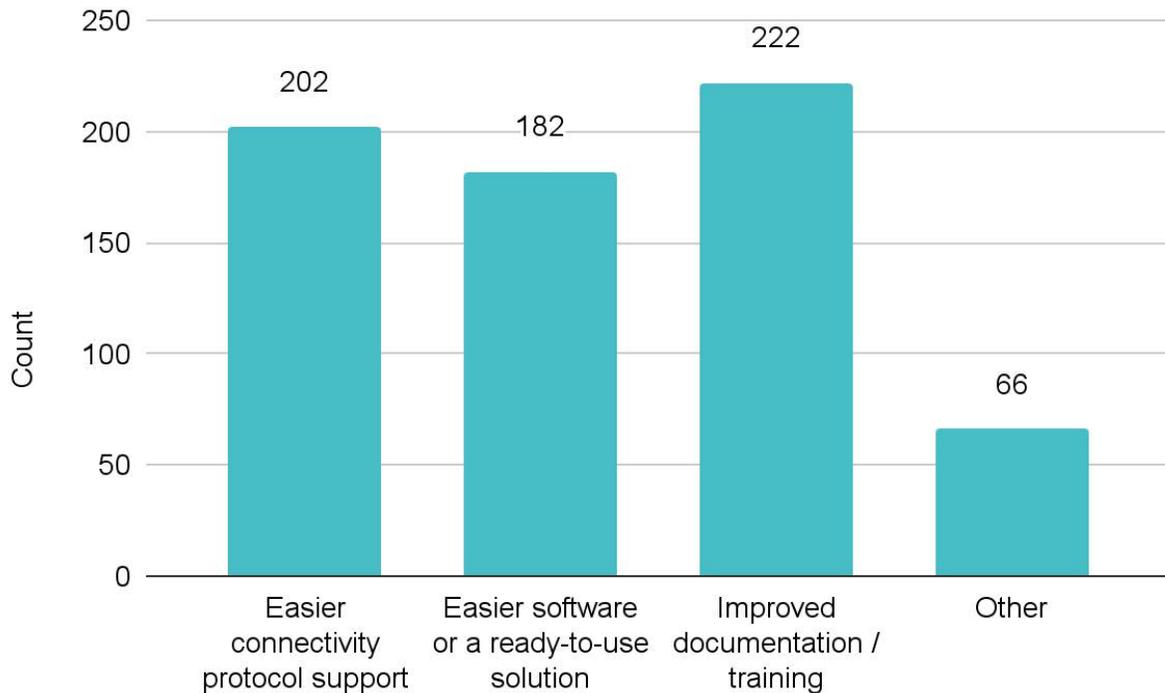
Who were the administrative contact(s) for your allocations? (multi-choice question)



The vast majority of allocations are on behalf of regional coordinators, generally assigned to a specific operator, club, and/or geographical region. Recent (post-2020) global allocations have often been for BGP usage, where usage is globally usable. As noted earlier, policies of legitimacy of allocations vary greatly between regional coordinators, pointing to a need for consistent standards across regions.

Q29 - Improvements to 44Net

What improvements would you like to see to 44Net in the future? (multi-choice question)

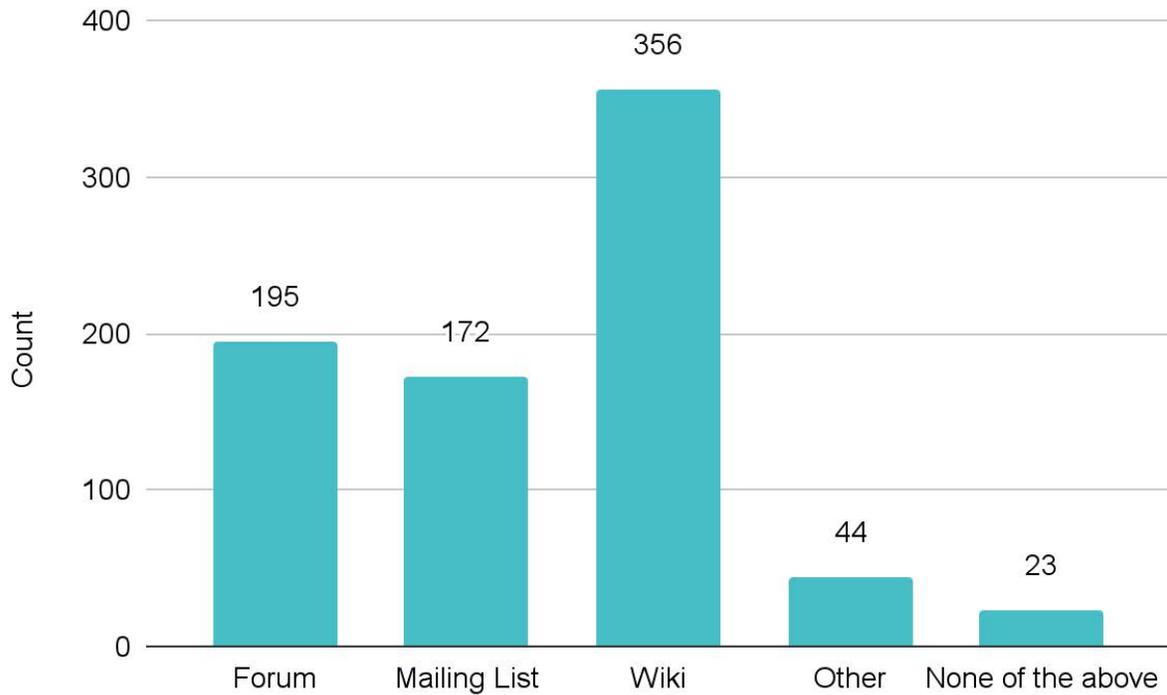


Respondents offered very granular suggestions ranging from OpenVPN as an alternative tunneling mechanism to a turnkey Raspberry Pi image. These represent easier ways to onboard users, [AREDN](#) is a good role model in how this can be done for a non-technical audience being quite successful as a highly technical deployment.

The current IPIP tunneling is very challenging for new users, as the protocol encapsulation is often not compatible with standard home routers performing NAT44 translation.

Q30 - Desired Resources

What resources are or would be helpful to your experience using 44Net?
(multi-choice question)



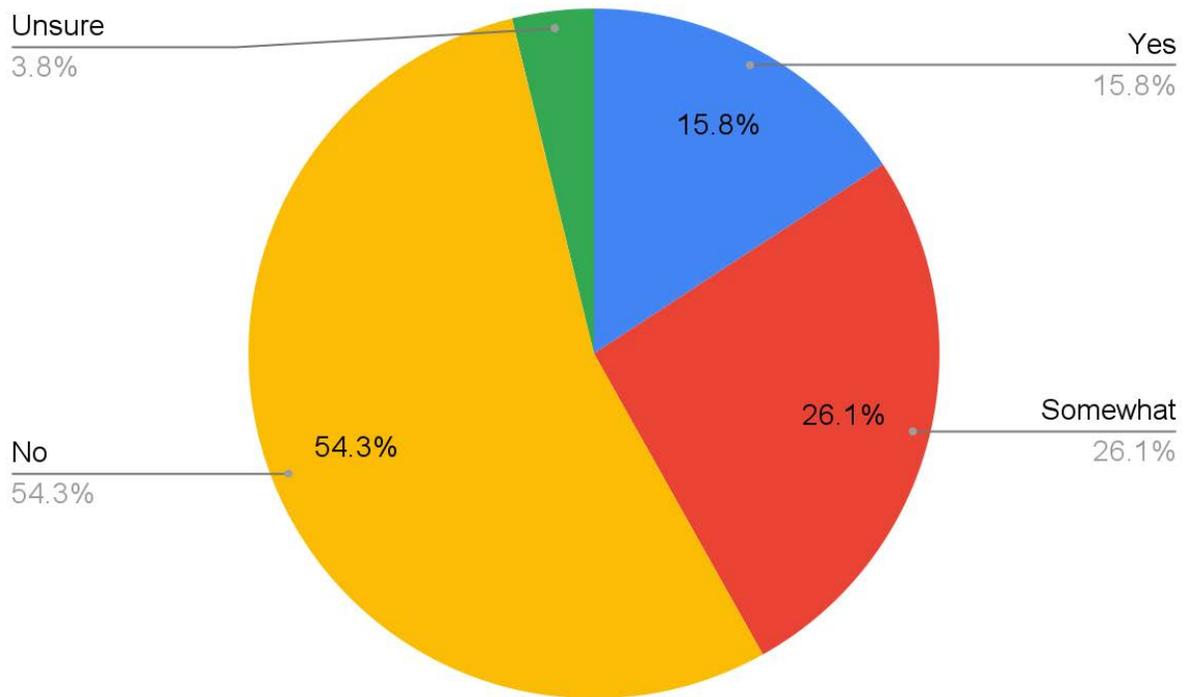
Wikis are the preferred documentation mechanism, such online sites allow for quick creation or modification of content but often need moderators to regularly clean house to avoid stale information.

The current 44Net wiki is fairly trivial to engage with vs. more technical workflows that could involve source markdown files, compilation, and then version control systems - as is often popular in open source software.

Failed or non-44Net Users

Q41 - 44Net awareness

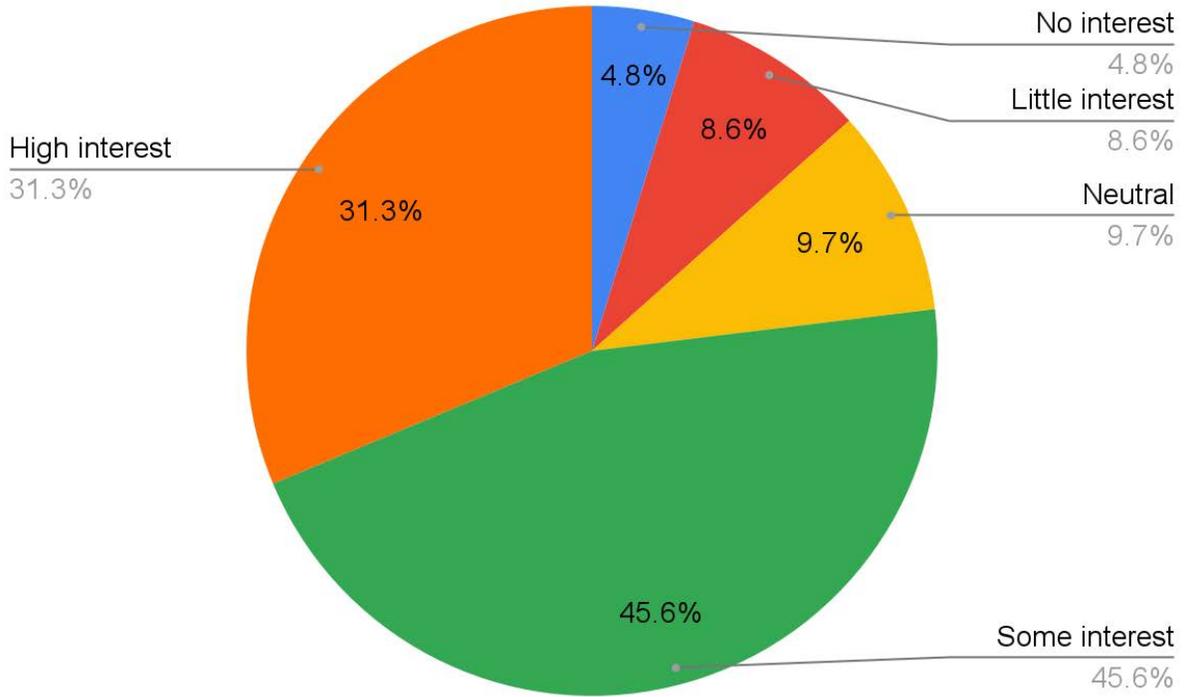
Prior to this survey, were you aware of 44Net and its history?
(single-choice question)



Throughout the survey, 44Net was often described as an in-the-know project that not widely known to the greater global amateur radio community. This high result of limited-to-no prior ARDC relationship is not surprising, as often the survey was reaching new participants and/or those who are involved in child projects that utilize 44Net - but are not directly involved in that relationship in either a technical or administrative manner.

Q43b - 44Net Interest

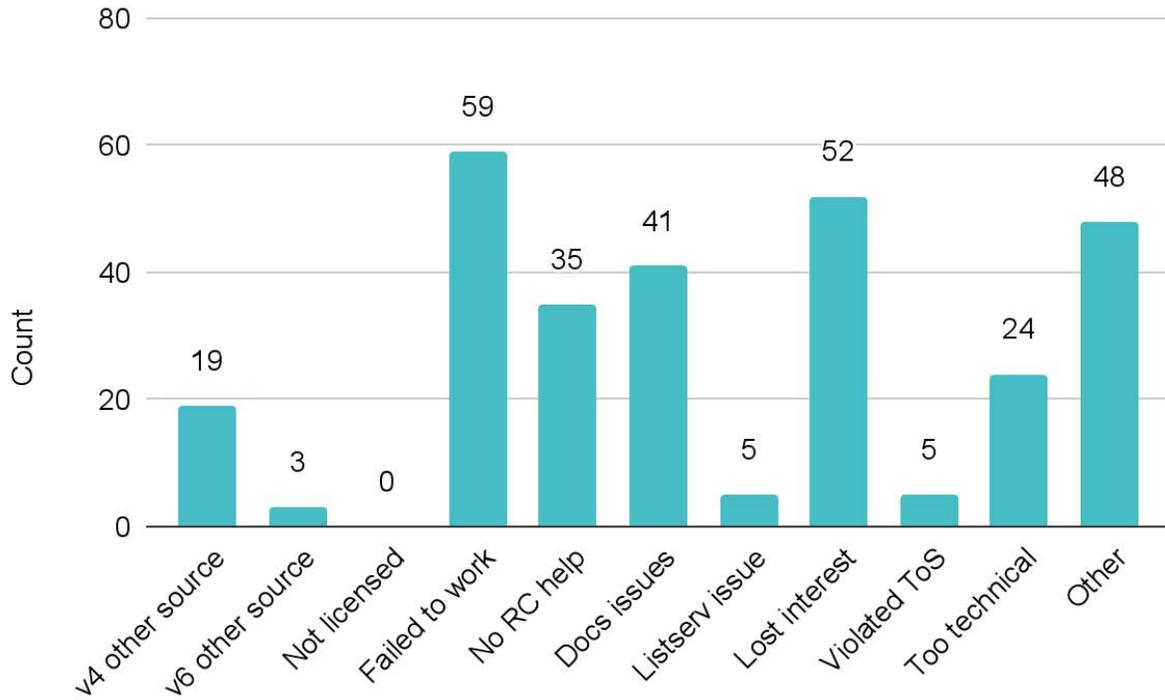
How interested are you in learning more about 44Net?
(single-choice question)



Though a number of respondents had no prior knowledge of 44Net, the survey revealed a great deal of interest in them learning more – over 75% showed some or high interest.

Q36 - Why Unsuccessful With 44Net

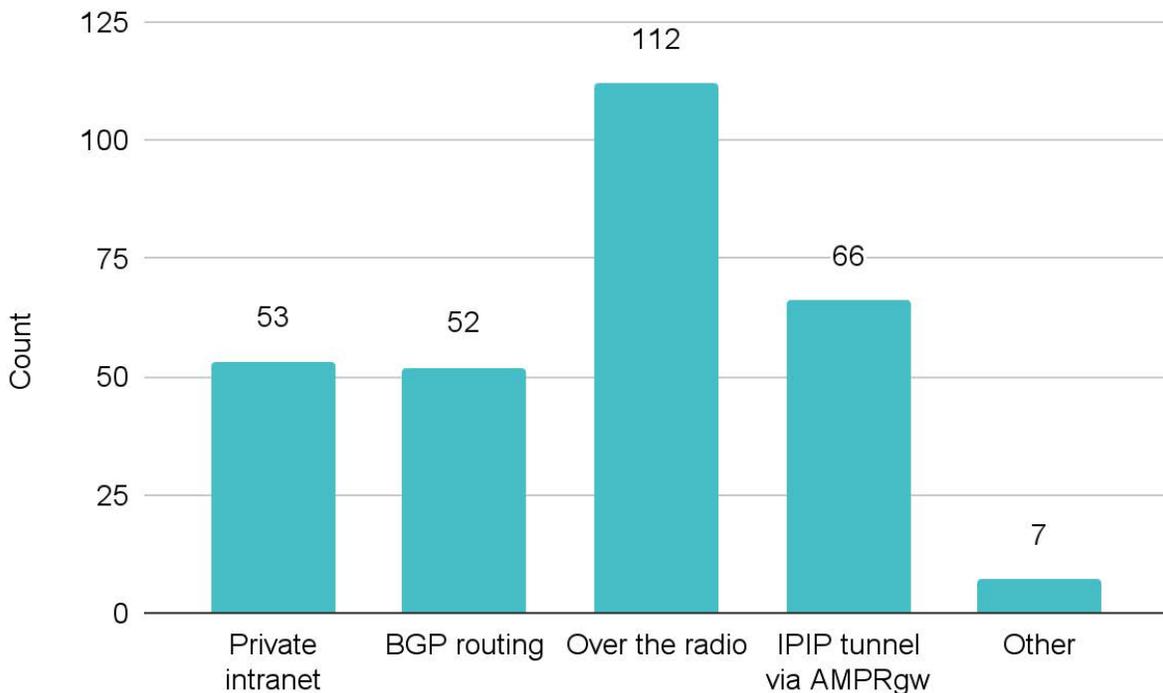
Why were you unsuccessful using 44Net? (multi-choice question)



This question - asked of respondents who had failed to get their allocation working – revealed inconsistent allocation procedures between regional coordinators, out-of-date documentation, and/or difficulty understanding the baseline subject matter - such as IP routing, Unix daemon configuration, etc. - as the primary culprits of setup difficulty.

Q37 - Type of 44Net Usage

If you had been able to use 44Net IP allocations, how would you be using it?
(multi-choice question)

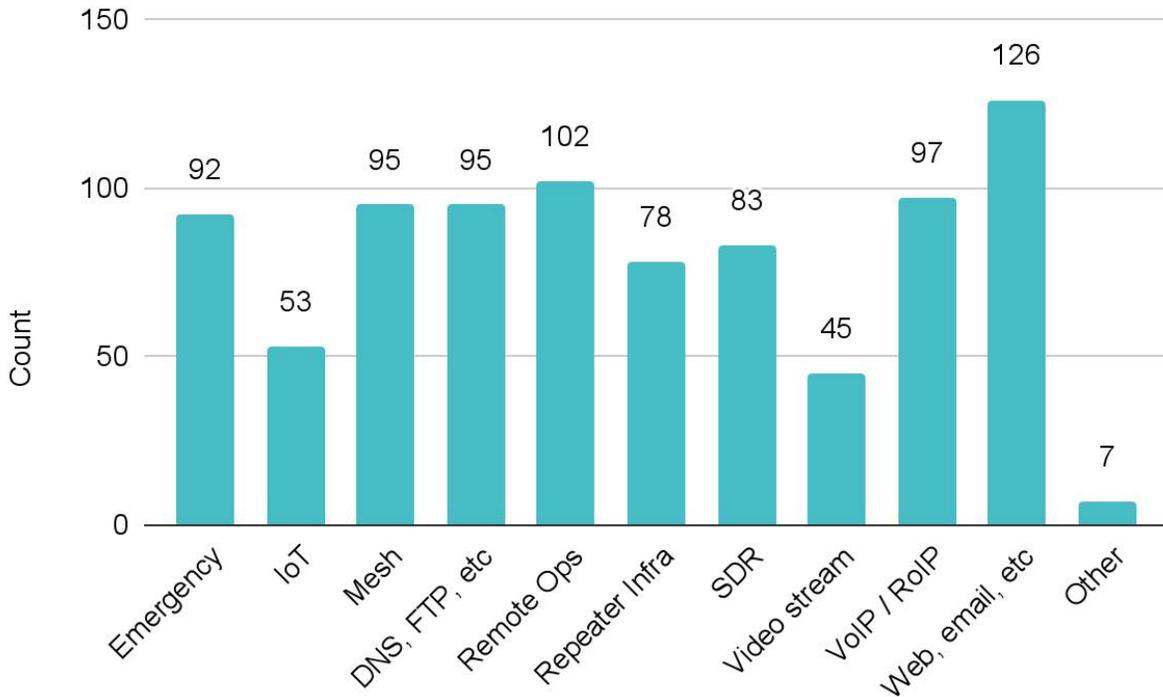


Respondents generally encouraged continued experimental use of 44Net, however these were mixed in both amateur specific operations along with general education efforts; that would not likely have a licensed amateur component (*e.g. STEM programs within schools*). The rationale for education is it's difficult to learn how to correctly BGP announce v4 blocks on the global Internet, as those resources are very limited and generally associated with a production network which could not tolerate outages.

Responders also favored a sort of RFC1918-like usage of a portion of 44Net, to allow for the equivalent of RFC6598 when amateur networks are interconnecting and need unique IP space.

Q38 - Desired Applications

What applications or services would you have liked to run on your 44Net prefix(es)?
(multi-choice question)

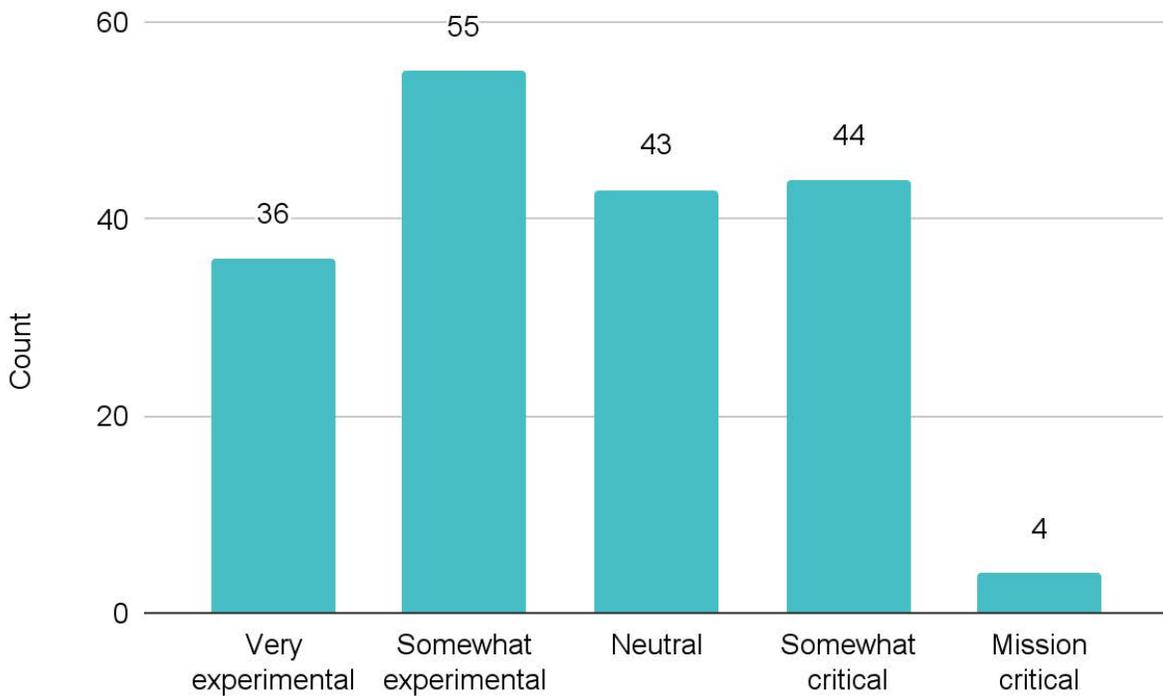


Often network software assumes Internet connectivity as a given, with prerequisites ranging from TLS certification validation to CDN (*content distribution network*) resources, such as logo templating or firmware updates. AREDN, for example, provides a [catalog of peer-to-peer software](#) which is known to operate on a private network that doesn't have external Internet connectivity. These applications range from keyboard-to-keyboard chat, video streaming, message boards, and even dispatch software.

Most amateur specific software programs can run on private networks without external Internet access, such as repeater configuration or LAN-based message boards.

Q39 - Resilience

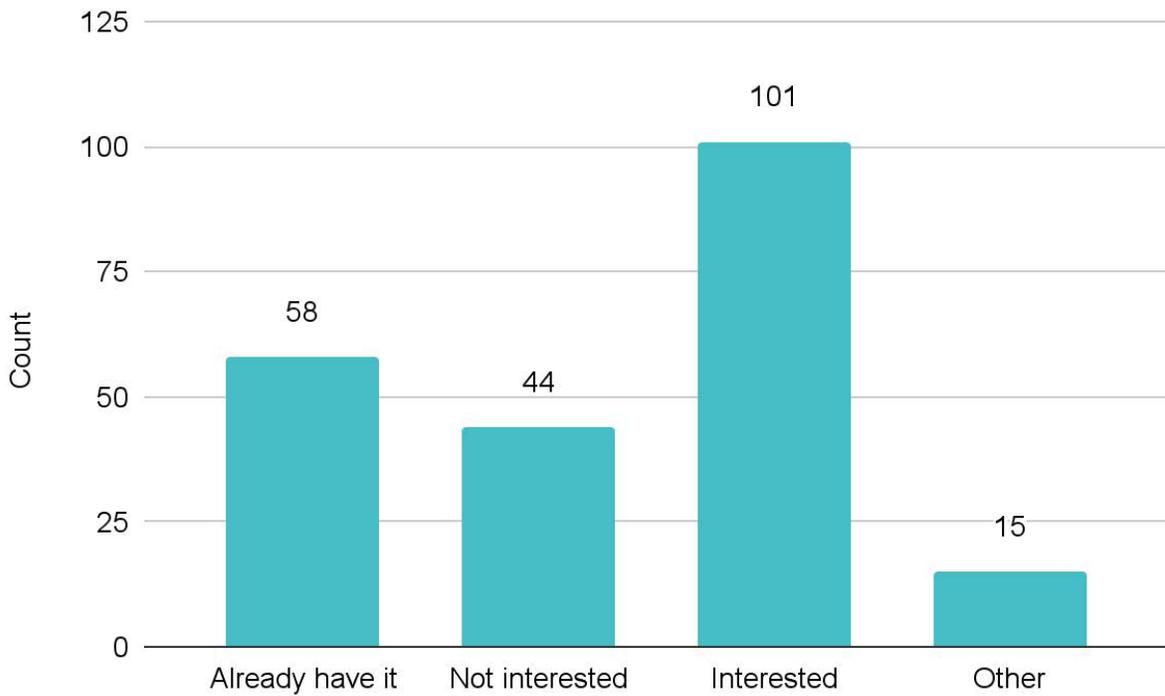
On a scale of very experimental to mission critical, how would you rate the applications you were trying to run on 44Net?
(single-choice question)



Most usage of 44Net is non-mission-critical, reflecting ARDC's terms of service for usage of 44Net: <https://www.ampr.org/about/legal/terms-of-service/>.

Q40 - IPv6 Interest

What is your interest in IPv6?
(multi-choice question)



IPv6 was generally discussed as a future or experimental effort; those that had tactical v6 examples had already secured allocations from an existing RIR and/or their own service provider(s).

IPv6 did however bring up a large theme that many amateur software / hardware does not natively support IPv6. This is a prerequisite problem to the question of whether ARDC provides such allocations in the future.

Q45/56 - IPv4 Free Usage

If you had access to free IPv4 address space, what would you do with it?

(Note that ARDC is a nonprofit and would only seriously consider nonprofit, educational, or experimental uses, particularly as they relate to amateur radio.)

(open-ended question)

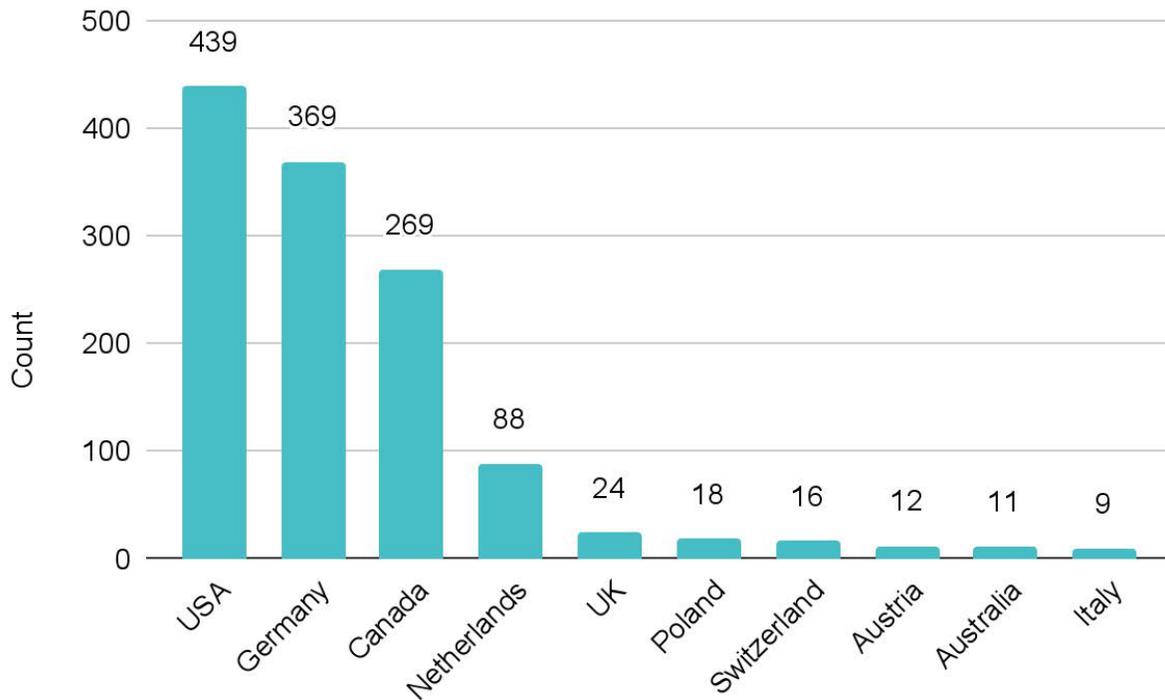
Most respondents continued to support the amateur radio focus (*e.g. ECOMM, mesh networks, repeater remote access*), however with the limitations imposed for this question (*i.e.: "seriously consider non-profit..."*) - recommendations were often in support of experimental BGP learning on the global internet and/or educational non-profit uses, such as training programs or peer groups of amateur radio - *e.g.:* other civil public good oriented groups. One innovative recommendation was to provide temporary loaner allocations for events like marathons.

Only 1 or 2 respondents suggested selling a portion or all of the 44Net IP space.

Demographics

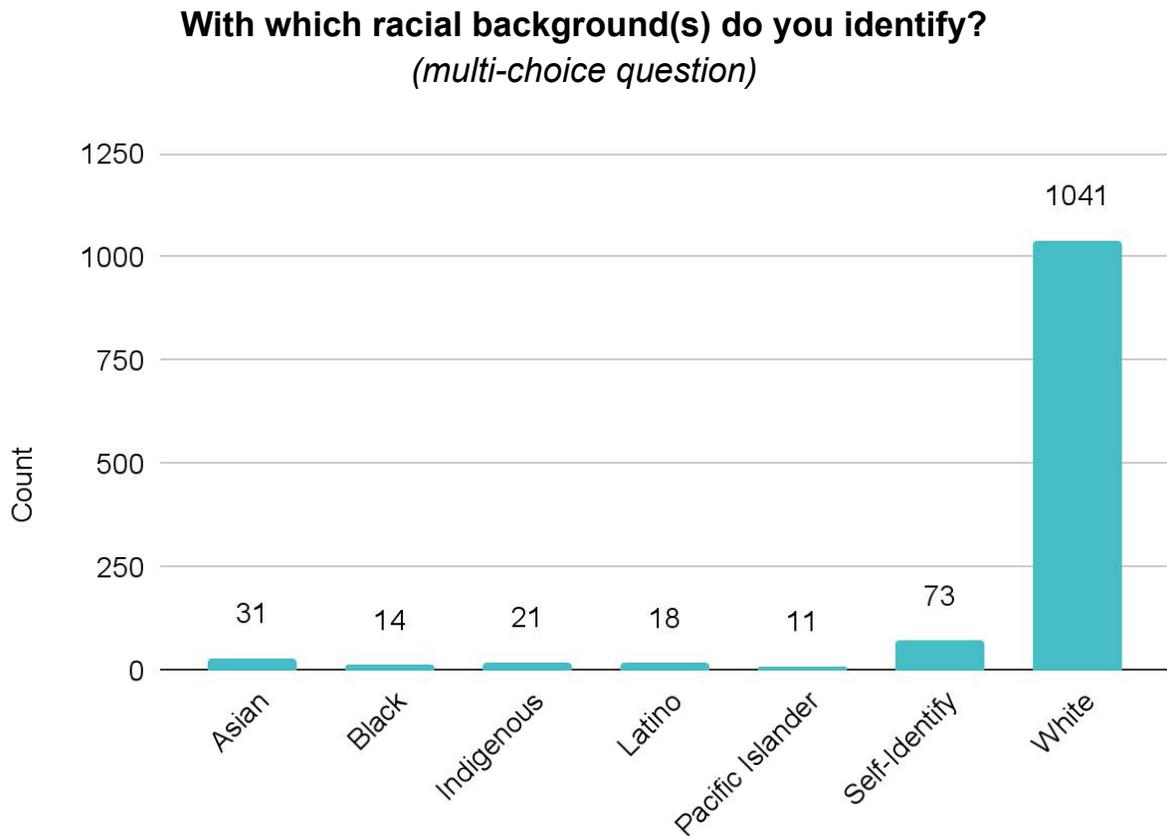
Q1 - Country

Which country do you primarily operate in? If you don't participate in amateur radio or are unsure, consider this the country you live in.
(single-choice question)



A total of 42 countries (with 1 or more responses) were represented. The vast majority of responses were from the USA, Germany, and Canada.

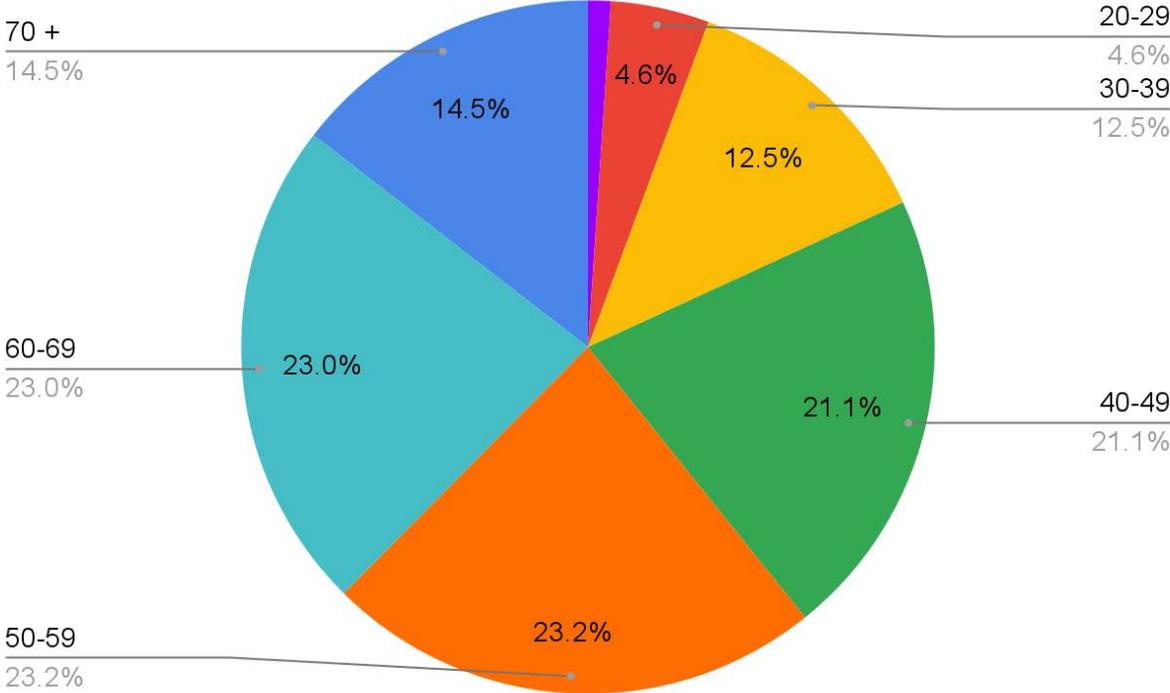
Q2 - Racial Background(s)



A large portion (though not all) of respondents who selected “Self-Identify” did not take the question seriously or used the open text field to express their displeasure with the question (which was optional).

Q3 - Age

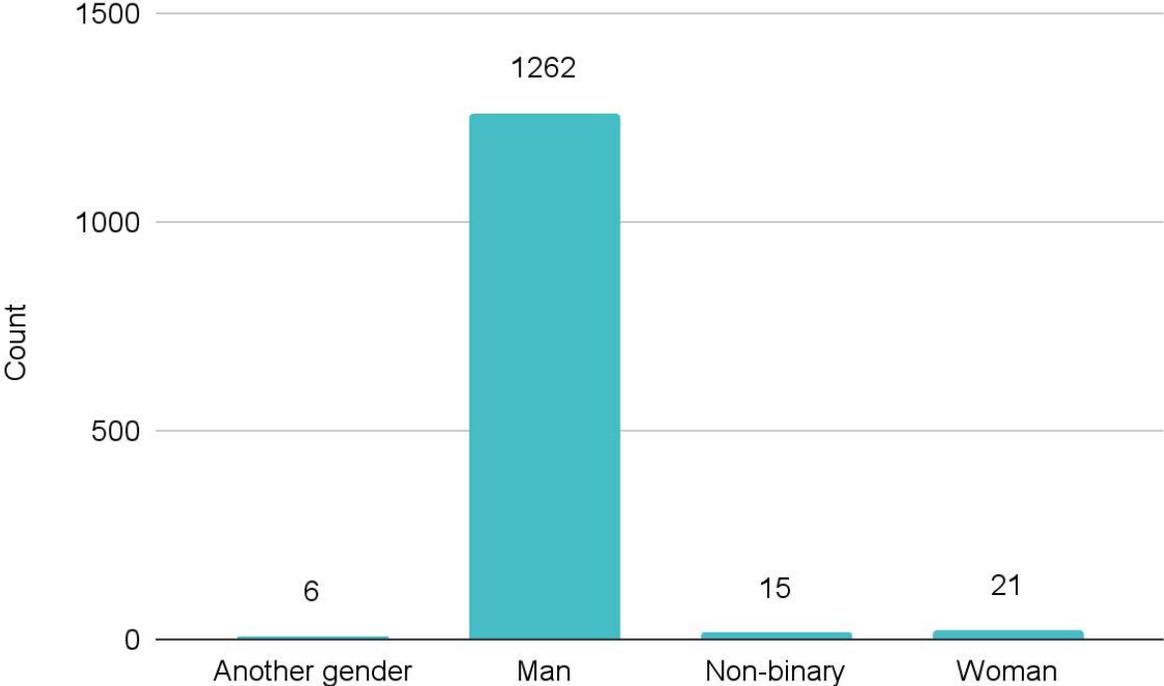
How old are you?
(single-choice question)



More than 60% of respondents were aged 50 and above. Only 5.7% were under the age of 30.

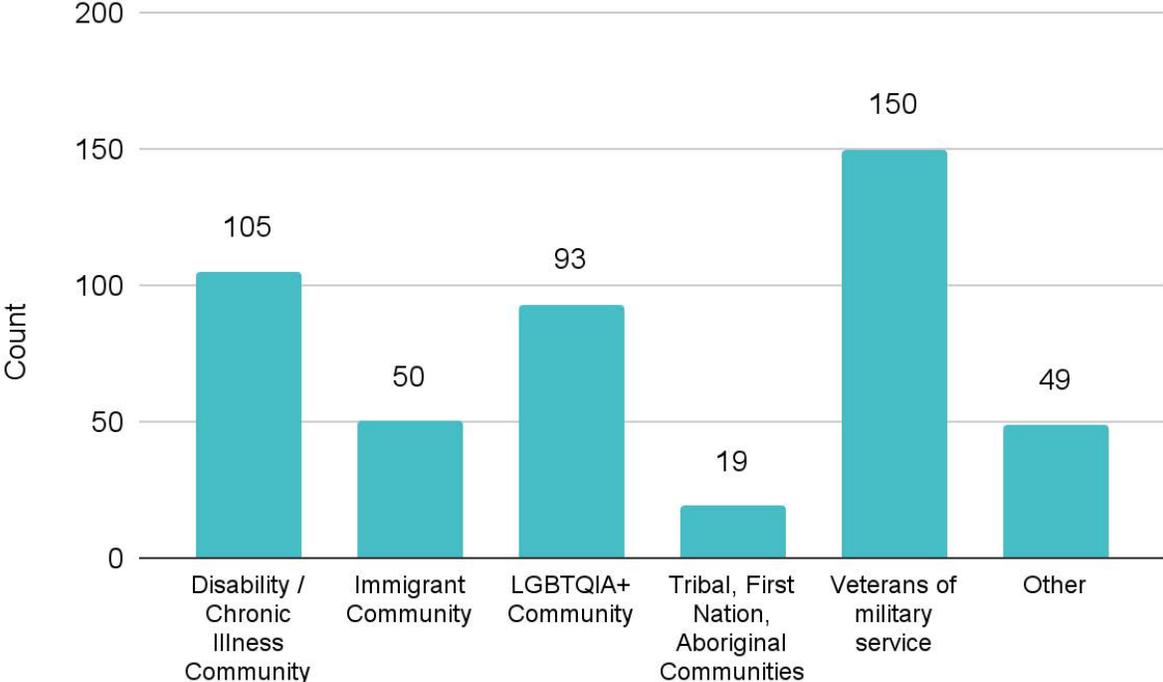
Q6 - Gender

What is your gender?
(multi-choice question)



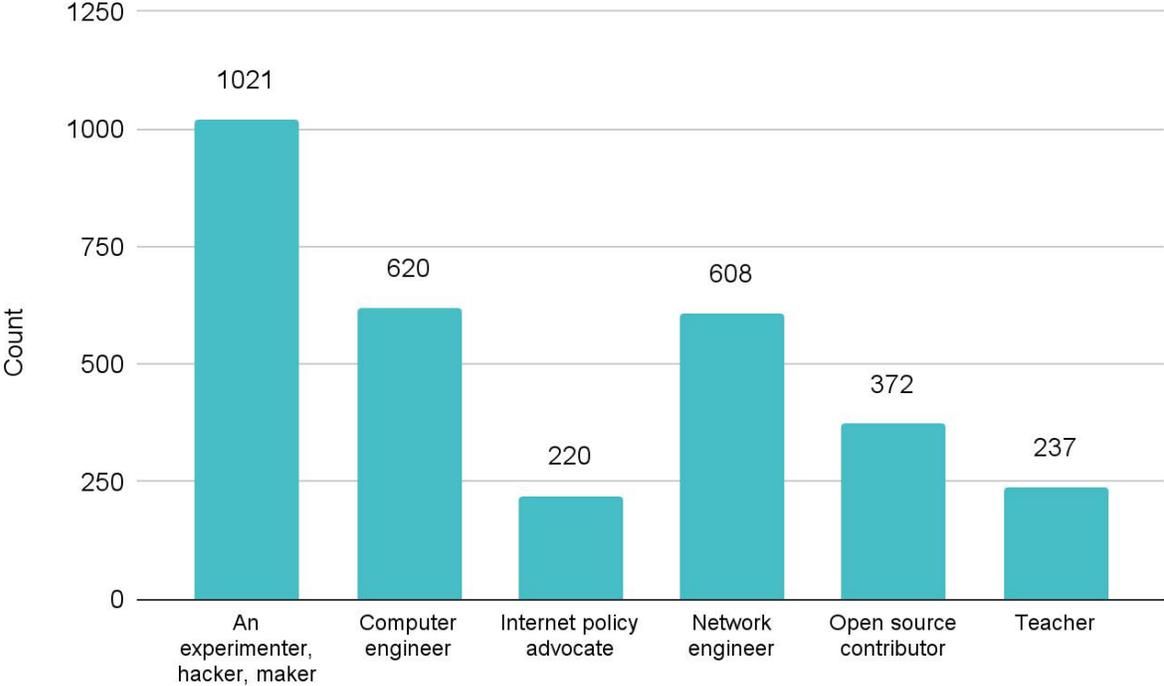
Q7 - Other Communities

Do you have experience as a part of any of the following communities?
(multi-choice question)



Q8 - Other Related Identities

Do you consider yourself any of the following?
(multi-choice question)



Focus Groups

Overview

ARDC staff and Two P agreed that the scope of work would include real-time interactive interview sessions. This resulted in two focus group sessions. The intention of these meetings was to discuss survey topics in more detail and/or discuss topics that were missed in the survey.

The two groups held were Regional Coordinators on August 5th, 2022 and 44Net Implementers on September 23rd, 2022. The coordinators are past and/or present volunteers who voluntarily manage the stewardship of 44Net allocations within a particular geographic region. Implementers are individuals writing software, operating infrastructure, or supporting users of 44Net in a non-coordinator role.

Methodology

ARDC staff invited all Regional Coordinators to their focus group via private email. An open call for participation by Implementers was posted on the 44Net mailing list and ARDC selected a list of participants. The meetings were held after the survey completion to allow for participants to provide feedback in a more interactive manner, along with identifying any major missing themes or questions.

Scheduling was weighted for a business hours time between Europe and North America. ARDC staff provided a Zoom video conference instance and also acted as the primary note taker.

Regional Coordinators Focus Group: Notes

Session date: 2022-08-05

Attendees

- **ARDC Team:** Rosy Schechter - KJ7RYV, John Hays - K7VE, Matt Peterson (TwoP) - K6MPP, Chris Smith - G1FEF (joined at about 8:50)
- **Regional Coordinators:** Marius Petrescu - YO2LOJ (present throughout)(Romania), Gabriel Medinas - YV5KXE (comes in around 8:10 and out about 8:20), David Ranch (at about 8:28)(Silicon Valley)

Slides

Slides from the session are available here:

<https://www.ampr.org/wp-content/uploads/ARDC-44net-Coordinator-Focus-Group.pdf>

Challenges & Solutions/Ideas Presented

Challenge: When people come to request an address assignment, they don't necessarily understand the why / how of using 44Net. Similarly, they don't understand BGP. It's work for coordinators to get people up to speed.

- "There is no killer use case for using the network."
- "Getting an IP address from a local provider can be faster and easier. 44Net primarily useful if you need static IP addresses."

Solutions/Ideas:

- Better documentation
 - Need clear definition of when someone should get a regional subnet vs. some other subnet be it for Internet focused traffic, BGP announced prefixes, etc. These concepts here have changed several times w/o discussion with coordinators and other users.

Challenge: There's not a clear advantage to using 44Net, aside from using a static IP address. It's very difficult to connect (particularly the IPIP mesh); local IP addresses can be much easier to implement and use.

Solutions/Ideas:

- Points of Presence! (This was a huge point of discussion, see below.)
- Easier connectivity using standard protocols that are device agnostic (VPNs, etc)

Challenge: Lack of transparency with regards to what is actually happening with ARDC address space: What is TAC working on? Why are people just told that, say, BGP allocations are going to a new area when folks were so recently informed they needed to move to another area? On the flip side, ARDC needs visibility into what is happening in each region.

- “Coordinators have inherited someone else’s IP scheme.”

Solutions/Ideas:

- Improved communication channels (e.g. groups.io, public commenting for policies)
- Increase communication for coordinators + ARDC team (via groups.io or similar)
- Have TAC member/chair share updates about what TAC is up to
- Keep regional coordinator role; supplement with additional administrative support to look out for when a coordinator drops off the map, gatekeeps, etc.

Points of Presence (PoP)

There was a great deal of discussion about the need for PoPs. Here are some points / ideas based on this discussion.

- Key reason for PoPs include:
 - Providing easier points of connectivity to the network
 - If we ran our own POP’s, we could do smaller BGP allocations w/o /24 requirement, requestors having to get their own ASN, or using Vultr, etc
- Standard protocols would make it possible for people to connect to the PoPs regardless of device. (Example: L2TP, etc built-in VPN options)
- Would be great if there was a way to do bulk address changes at the user level; would make relocation much easier for 44net users.
- People in the network are already experimenting with PoPs; it would be great to collect documentation about what’s working and what’s not to create a more robust plan.
 - This is something that the forthcoming Tech Director could do
 - There may be interest in volunteers prototyping this system or sharing what works for them.

Portal

Some additional thoughts were brought up about the Portal that are worth tracking.

- Needs to have a ticketing system that would allow people to be able to track their requests. (Was noted to participants that this is in the works.)
- Needs consistent requirements for coordinators to use to approve assignments.
- Coordinators would love the opportunity to review specs for the portal.

Additional thoughts shared in the focus group.

- Coordinators see themselves as helpers and mediators, “like an Elmer role”
- Notes that recent moves to reorganize space have to do more with organizational issues rather than technical ones. Concerns that there will be technical issues following the move.
- If there is interest, Chris can code up a Kerberos server. After the meeting, David notes that he has questions about this choice.
- There is interest in a Logbook of the World or some other level of authentication (such as web of trust).
- Note that there are different rules in different countries.

Implementers Focus Group: Notes

Session date: 2022-09-23

Attendees

- **ARDC Team:** Rosy Schechter - KJ7RYV, John Hays - K7VE, Matt Peterson (TwoP) - K6MPP, Adam Lewis - N7ARX (member of TAC)
- **Regional Coordinators:** Dan Kaiser - VE4DRK- Winnipeg, Mark van Daele - K9MEV - RC Illinois, Mathison - KJ6DZB - Bay Area, Kris Kirby - KE4HR - RC Alabama, Nick Booth - N1CCK - Connecticut, Ronnie Montgomery - W0RDM - St Louis, Samim - E74KS - RC Bosnia, Gary Oliver - dropped off

Slides

Slides from the session are available here:

https://docs.google.com/presentation/d/1gHgrtow8zEGes_K_C7FRDkj-qcV4Wi8QpLNIM88njo8/edit#slide=id.gb823c44918_7_50

Challenges & Solutions/Ideas Presented

Challenge: Unresponsive regional coordinators. Uncommunicated policy changes re: BGP assignment locations. Documentation is out of date, lack of documentation is a barrier to entry. *(Note that documentation was brought up quite a bit, which has been a consistent theme in this assessment.)*

- “There is no killer use case for using the network.”
- “Getting an IP address from a local provider can be faster and easier. 44Net primarily useful if you need static IP addresses.”

Needs:

- Additional gateways besides UCSD.
- Standards and standard operating procedures, particularly for Regional Coordinators. (Consistent theme throughout survey and discussions).
- More visibility into what’s happening at ARDC. This could include a calendar, community engagement, additional reports from TAC on progress (even if it’s just that they’ve been working on a document.)
- Easy way for new users to plug in.
- Points of Presence (PoPs) would be very helpful. (Consistent theme throughout survey and discussions).
- More mentorship / Elmer setup.
- All would like clarification re: use of encryption of internet services on ham bands. Some understanding is that no encryption is possible; other interpretations note that encrypted protocols are allowed.
- A sense of Why behind 44Net – WHY is preserving and using this network important?

Ideas:

- ARDC could use groups.io for email subgroups. (Rosy notes that this is already in the works.)
- ARDC could open up the 44Net wiki for public contribution. (Chris notes after the meeting that this is already available).
- ARDC could use a chat service like Discourse or similar for real-time chat.
- ARDC could employ a lawyer to get clarification / legal opinion on encryption on ham bands.
- “What is the WHY? Big picture examples”
- What you’re using it for, like QST
- Service portal is essential.
- Address space essential.
- People want to do what they can to help improve 44Net. There’s just not a clear way in right now.