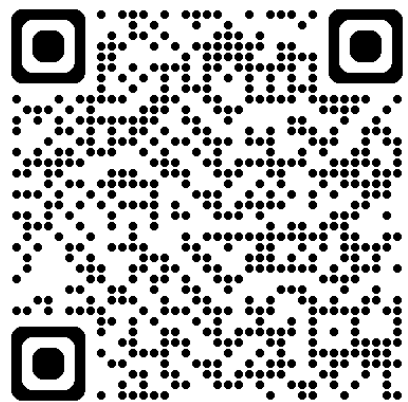




APRS, EMERGENCY COMMUNICATIONS AND NET CENTRAL

OVERVIEW

APRS and EmComm

What is missing?

Filling the gap

Moving forward

APRS AND EMERGENCY COMMUNICATIONS

APRS is a key technology for providing EmComm uses:

- Sending small tactical emergency messages
- Tracking location of resources
- Providing situational awareness of weather and natural environment
- Enabling information sharing in low-cost, open format
- Modeling real-life objects for status and location reporting

CURRENT DEFICIENCIES

APRS has not been exploited to its full capabilities

- Lacks focus-built tools for enabling emergency communications
- **Many rely upon internet-based solutions that may not be available in emergency situations such as remote or internet-free areas.**

Example: ARES teams and others create “nets” that do not go beyond sending a “check-in” message, creating dependencies on tools like APRS-IS, ANSRVR and web sites such as APRS.FI.

WHAT IS NEEDED?

To fully exploit APRS in EmComm settings, a new tool must:

- Enable the management of “nets”
 - Who is participating, from where and how
 - Share information and messages easily within the net
- Support operations and situational awareness in challenging environments primarily with ***internet being optional***
- Identify and report on local infrastructure supporting the radio landscape
- Identify and report on natural world (weather, physical items)

NET CENTRAL – CREATED FOR SUCH A NEED

Net Central allows you to:

- Create a “net” accessible via APRS over its own callsign
 - Example: NEAPRS-1
- Monitor participation through operator check-in/check-out
- Send group messages between net participants
- Ask questions and receive answers from net participants
- Gain situational awareness of net participants
- Simplified commands for radio text input along with web-based application make nets easy!

NET CENTRAL – CREATED FOR SUCH A NEED

Additionally, Net Central enhances situational awareness:

- Identify and report on radio infrastructure
 - iGates, Repeaters, Winlink and Digipeaters
- Gather information from local weather stations
- Visualize participants and infrastructure locations on maps
- Net Central will listen to available traffic to identify these resources and maximize the usefulness of the information it has heard.

NET CENTRAL – CREATED FOR SUCH A NEED

Net Central enables APRS-augmented reality:

- Create objects representing real-world infrastructure and provide user-defined reports to enrich situational awareness.
- Model hospitals and medical treatment facilities, and report on their capabilities and capacity
- Identify incident locations and provide details



USING NET
CENTRAL

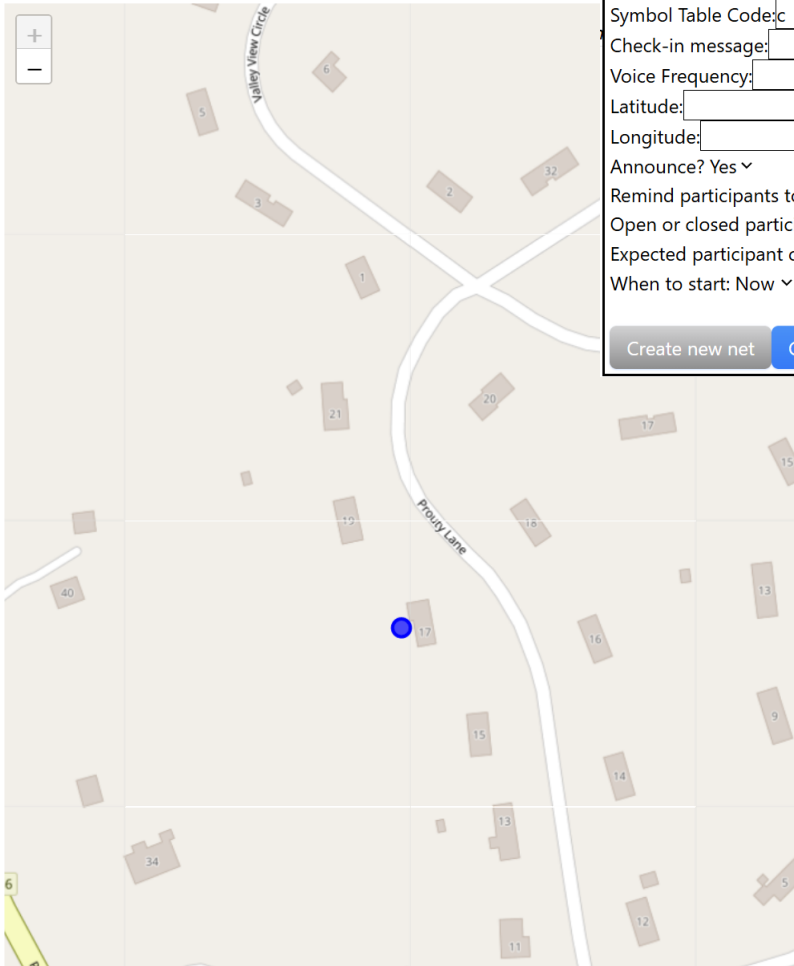
Net Central

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

Auto-update: On
[Turn off](#)

Net Monitor

Information about APRS nets, participants, messages, questions, answers and related information



Create Net

A net is identified on APRS with a callsign and a name. It can be started now, or scheduled to start at a future time.

Callsign:

Name:

Description:

Symbol Table ID:

Symbol Table Code:

Check-in message:

Voice Frequency:

Latitude:

Longitude:

Announce? Yes ☐

Remind participants to check out? Yes ☐

Open or closed participation? Open ☐

Expected participant callsigns:

When to start: Now ☐

[Create new net](#) [Cancel](#)

[Create New Net](#)

- ☐ Show infrastructure
- ☐ Show Tracked Stations
- ☐ Show Priority Objects
- ☐ Show objects

Messages

[Send Message](#)

No messages.

Participant Information

Click on a participant

Starting a net is simple:

- Choose the Net Monitor menu, and click on “Start new net”
- You will be asked for the following information:
 - A callsign by which the net will be known
 - A name and description
 - An optional location and complimentary voice frequency the net would use

Net Central

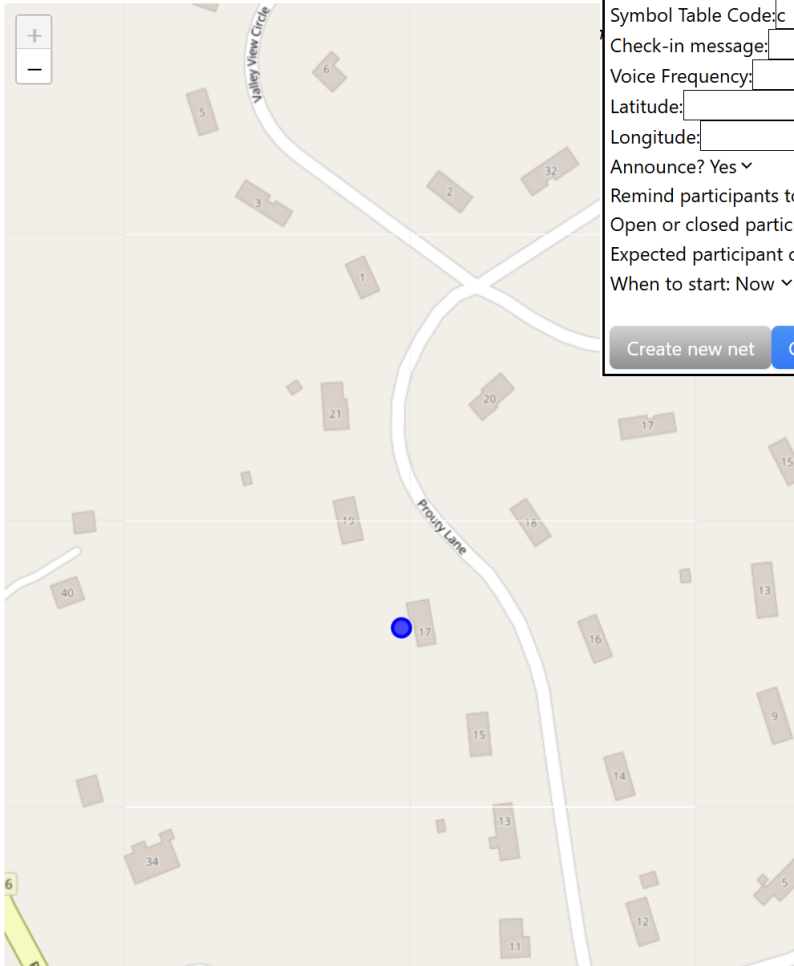
- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

Auto-update: On

Turn off

Net Monitor

Information about APRS nets, participants, messages, questions, answers and related information



Create Net

A net is identified on APRS with a callsign and a name. It can be started now, or scheduled to start at a future time.

Callsign:

Name:

Description:

Symbol Table ID:

Symbol Table Code:

Check-in message:

Voice Frequency:

Latitude:

Longitude:

Announce? Yes ☐

Remind participants to check out? Yes ☐

Open or closed participation? Open ☐

Expected participant callsigns:

When to start: Now ☐

Create new net

Cancel

Create New Net

- Show infrastructure
- Show Tracked Stations
- Show Priority Objects
- Show objects

Messages

Send Message

No messages.

Participant Information

Click on a participant

Additional net settings

- Announce as bulletin on BLN0 (configurable) or not
- Define a check-in message displayed to a new net participant
- Enable/disable reminder messages for active check-ins
- Start a net immediately or schedule for a recurring or one time basis.

Net Central

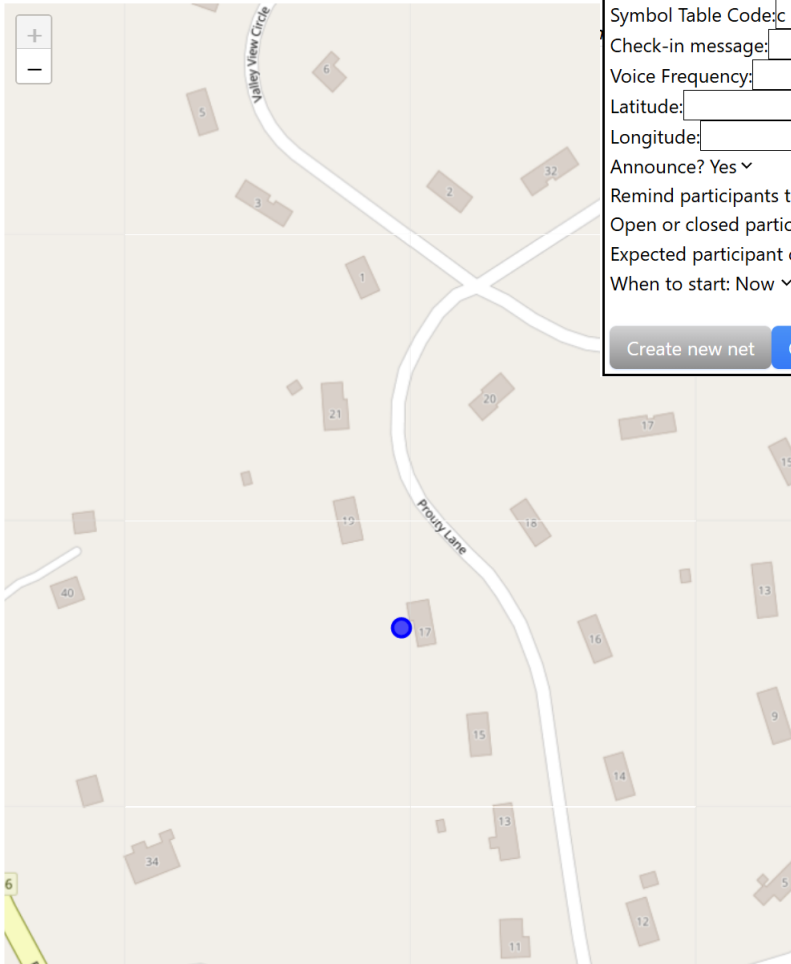
- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

Auto-update: On

Turn off

Net Monitor

Information about APRS nets, participants, messages, questions, answers and related information



Create Net

A net is identified on APRS with a callsign and a name. It can be started now, or scheduled to start at a future time.

Callsign:

Name:

Description:

Symbol Table ID:

Symbol Table Code:

Check-in message:

Voice Frequency:

Latitude:

Longitude:

Announce? Yes ☐

Remind participants to check out? Yes ☐

Open or closed participation? Open ☐

Expected participant callsigns:

When to start: Now ☐

Create new net

Cancel

Create New Net

- Show infrastructure
- Show Tracked Stations
- Show Priority Objects
- Show objects

Messages

Send Message

No messages.

Participant Information

Click on a participant

Open vs Closed nets

- Nets can be “open” or “closed”
 - Open nets will allow anyone to join
 - Closed nets are limited to a specified list of expected callsigns.
- Closed net participation can be expanded by any participant inviting another by callsign using a radio command “INV callsign”

Net Central

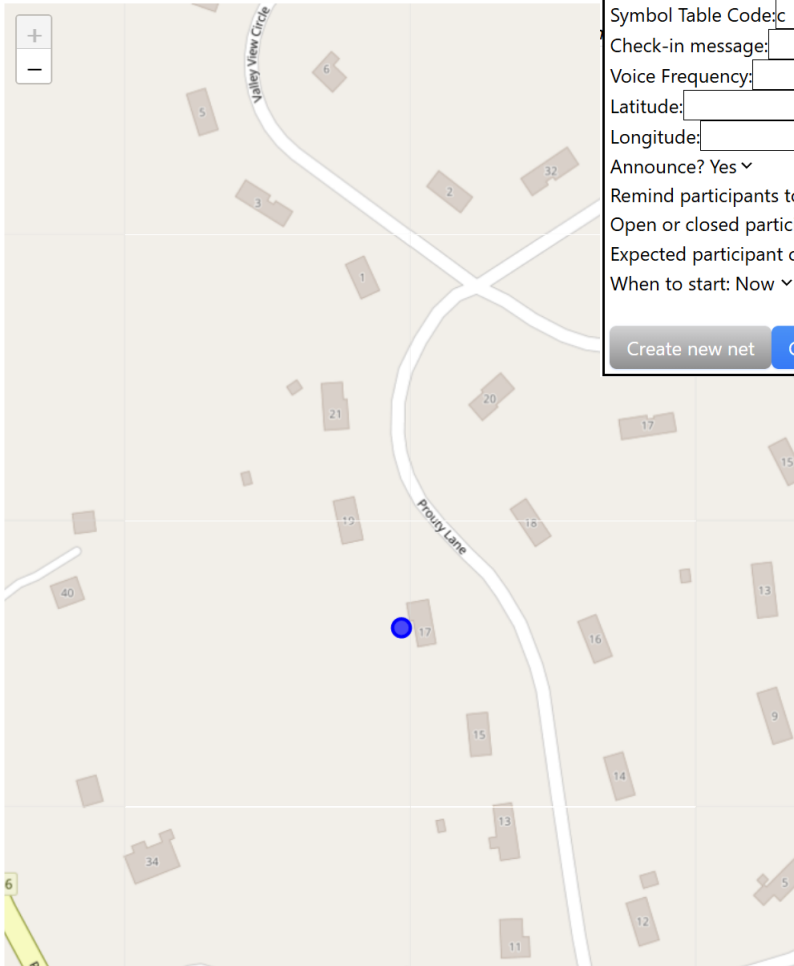
- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

Auto-update: On

Turn off

Net Monitor

Information about APRS nets, participants, messages, questions, answers and related information



Create Net

A net is identified on APRS with a callsign and a name. It can be started now, or scheduled to start at a future time.

Callsign:
Name:
Description:
Symbol Table ID:
Symbol Table Code:
Check-in message:
Voice Frequency:
Latitude:
Longitude:
Announce? Yes ☐
Remind participants to check out? Yes ☐
Open or closed participation? Open ☐
Expected participant callsigns:
When to start: Now ☐

Create new net

Cancel

Create New Net

- Show infrastructure
- Show Tracked Stations
- Show Priority Objects
- Show objects

Messages

Send Message

No messages.

Participant Information

Click on a participant

Expected participants

- Open or closed nets can have a list of callsigns of operators expected to participate.
 - Any SSID allowed for callsign
 - Participant list will show as absent until a check-in is made.

SIMPLE MESSAGE-BASED COMMANDS

Once a net is started, any APRS messaging client or radio can send messages to the net callsign to act within the net.

CI - Check in to net

CO - Check out of net

SIMPLE MESSAGE-BASED COMMANDS

Additional commands:

S status - report your status

T callsign - set tactical callsign for net

F frequency - report the voice frequency that you are monitoring

X n - report your transmit power n in watts

E (BATTERY, COMMERCIAL, GENERATOR, NONE, SOLAR) - report your electrical power type

B (BATTERY, COMMERCIAL, GENERATOR, NONE, SOLAR) - report your backup electrical power type

Y (APPLIANCE, BASE, HANDHELD, INTERNET, MOBILE, OTHER) - report your radio style

CI, CO, T, F, X, E, B, and Y can all be combined in a single message
(ex: CI X 50 E COMM B SO)

SIMPLE MESSAGE-BASED COMMANDS

Additional commands:

I - Send net info (name, voice frequency, description)

L - list net participants, their callsigns, status, location, and voice frequency monitored

P callsign - ping callsign to test connectivity

O callsign - get known operational status of a station by its callsign

INV callsign[,...] - invite one or more callsigns to a net

NCI - toggle notification of all check-ins and check-outs (default OFF)

SIMPLE MESSAGE-BASED COMMANDS

Additional commands:

M - send message to all participants in net

MC - send message to only net control

R n - replay last n messages sent to the net (n is a number)

Q - send a question to all participants in net

A n - answer question n sent to the net

QL -send a list of unanswered questions

QR -Report on question n and its answer

H - display help message of all commands

Net Central

Home

Dashboard

Net Monitor

Archives

Explorer

Tools

Setup

Logout

Auto-update: On

Turn off

Net Monitor

NEAPRS-2

NE APRS Test Net - testing Net Central

Voice:

Created by: jcrokiki@gmail.com

Started: 2025-12-07 00:20:20 - Announced

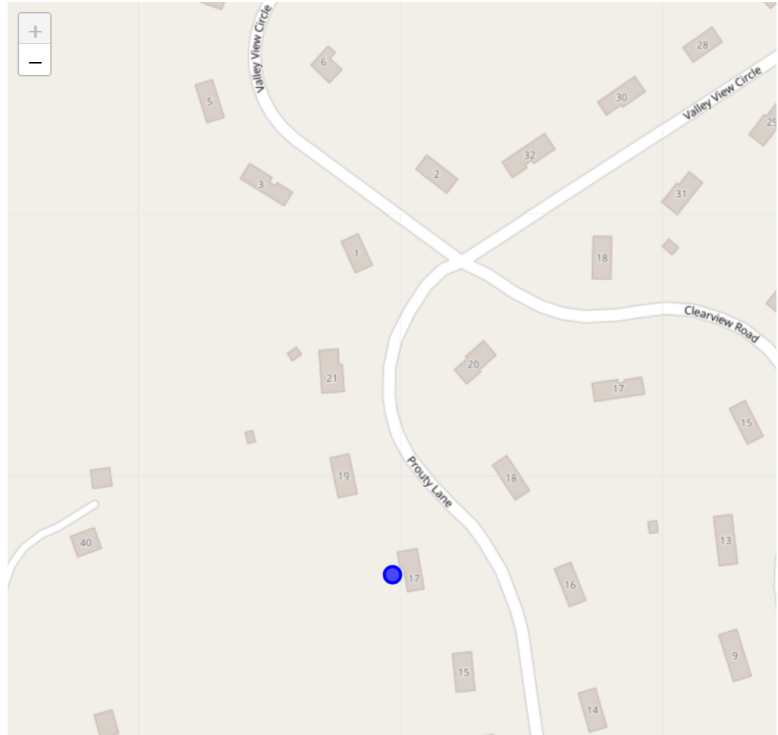
Edit Net

Secure Net

Create New Net

Information about APRS nets, participants, messages, questions, answers and related APRS resources.

- Show infrastructure
- Show Tracked Stations
- Show Priority Objects
- Show objects



Participants

Callsign	Tactical Callsign	Start time	Lat	Lon	Status	Last Heard
KC1VMZ-4		2025-12-07 00:22:17	4222.89N	07157.30W		2025-12-07 00:26:27
AB1PH					Absent	

rows per page: 10 1-2 of 2 1

Messages

Send Message

Time	From	Recipient	Message
2025-12-07 00:27:36	NEAPRS-2	Net	Weather conditions changing - stay safe!

rows per page: 10 1-1 of 1 1

Questions

Ask Question

Number	Question	Asked Time	Active
1	Is everyone in place?	2025-12-07 00:27:47	true

rows per page: 10 1-1 of 1 1

Participant Information

Details

Callsign info

Actions

Callsign: KC1VMZ-4

Tactical Callsign:

Start time: 2025-12-07 00:22:17

n: 4222.89N / 07157.30W

Loc: UNKNOWN

Answers

Callsign	Answer	Answered Time
KC1VMZ-4	yes	2025-12-07 00:28:02

1

Monitoring the net

By selecting a net from the list of active nets, you can see who has checked in, where they are located, and what messages, questions and answers have been sent within the net. Absent participants are also shown.

Messages can be sent via radio to the net callsign, or from this web console, to all net participants.

Archived Net Information

Information about previous nets, including participants, messages, questions and answers.

Archived Nets

Callsign	Name	Start Time	End Time
NEAPRS-2	NE APRS Test Net	2025-12-07 00:20:20	2025-12-07 09:03:28
NEAPRS-8	NE APRS Test Net	2025-12-07 00:14:15	2025-12-07 00:19:50
NEAPRS-2	NE APRS Test Net	2025-12-07 00:09:39	2025-12-07 00:19:52
NEAPRS-8	NE APRS Test Net	2025-12-06 21:11:11	2025-12-07 00:09:06
NEAPRS-2	NE APRS Test Net	2025-12-06 20:30:39	2025-12-07 00:07:00
NEAPRS-2	NE APRS Test Net	2025-12-06 20:15:41	2025-12-06 20:30:12
NEAPRS-8	NE APRS Test Net	2025-12-06 20:12:57	2025-12-06 20:13:34
NEAPRS-8	NE APRS Test Net	2025-12-06 19:42:14	2025-12-06 20:02:46
NEAPRS-8	NE APRS Test Net	2025-12-06 19:39:05	2025-12-06 19:39:47
NEAPRS-8	NE APRS Test Net	2025-12-06 19:27:31	2025-12-06 19:37:45
rows per page: 10 1-10 of 30 < 1 2 3 >			

Details - NEAPRS-2

Name: NE APRS Test Net
Description: testing Net Central
Voice Frequency:
Start time: 2025-12-07 00:20:20
End time: 2025-12-07 09:03:28

- Generate ICS 309 report
- Generate message report
- Generate Q&A report

Participants

Callsign	Tactical Callsign	Check-in	Check-out	Electrical Power	Backup Power	Transmit Power
KC1VMZ-4		2025-12-07 00:22:17	2025-12-07 00:37:14			0
KC1VMZ-4		2025-12-07 00:20:43	2025-12-07 00:21:54			0
A81PH						
rows per page: 10 1-3 of 3 < 1 >						

Messages

Time	From	To	Message
2025-12-07 00:27:36	NEAPRS-2	Net	Weather conditions changing - stay safe!
rows per page: 10 1-1 of 1 < 1 >			

Questions

Number	Question	Asked Time	Active
1	Is everyone in place?	2025-12-07 00:27:47	true
rows per page: 10 1-1 of 1 < 1 >			

Answers

Callsign	Answer	Answered Time
KC1VMZ-4	yes	2025-12-07 00:28:02
>		

Securing the net

When securing the net, an archived copy of the net, its participants and messages are maintained.

Absent participants are also reported and included in the ICS 309 report.

Net Central

Home

Dashboard

Net Monitor

Archives

Explorer

Tools

Setup

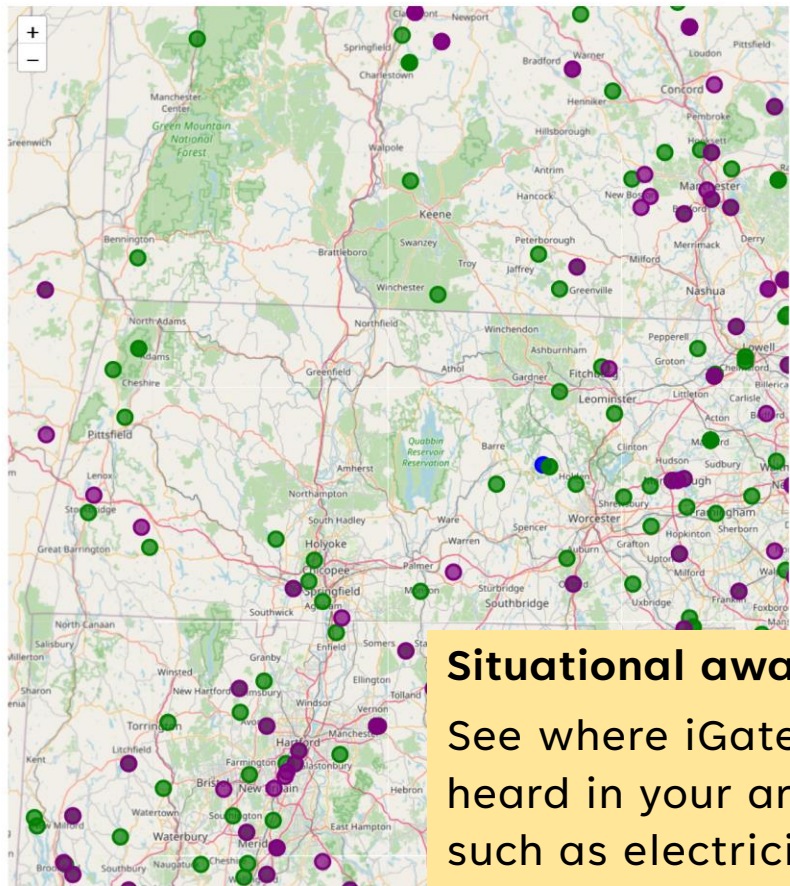
Logout

Auto-update: On

Turn off

Net Monitor

Information about APRS nets, participants, messages, questions, answers and related APRS resources.



NEAPRS-2
NE APRS Test Net - testing Net Central
Voice:
Created by: jcrokicky@gmail.com
Started: 2025-11-28 14:41:56 - Not announced

Edit Net Secure Net

Create New Net

- Show infrastructure
- Show Tracked Stations
- Show Priority Objects
- Show objects

Participants

Callsign	Tactical Callsign	Start time	Lat	Lon	Status	Last Heard
KC1VMZ-15		2025-11-28 14:53:09	4222.89N	07157.29W		2025-11-28 14:52:56
KC1VMZ-4		2025-11-28 14:42:28	4222.89N	07157.30W		2025-11-28 14:42:25

rows per page: 10 1-2 of 2 1

Messages

Send Message

Time	From	Recipient	Message
2025-11-28 14:54:27	KC1VMZ-4	Net	Weather conditions changing. Stay safe!

rows per page: 10 1-1 of 1 1

Questions

Ask Question

Number	Question	Asked Time	Active
2	1 Not yet	2025-11-28 14:55:48	true
1	Is everyone in position?	2025-11-28 14:54:56	true

rows per page: 10 1-2 of 2 1

Participant Information

Click on a participant above for more information.

Situational awareness of infrastructure

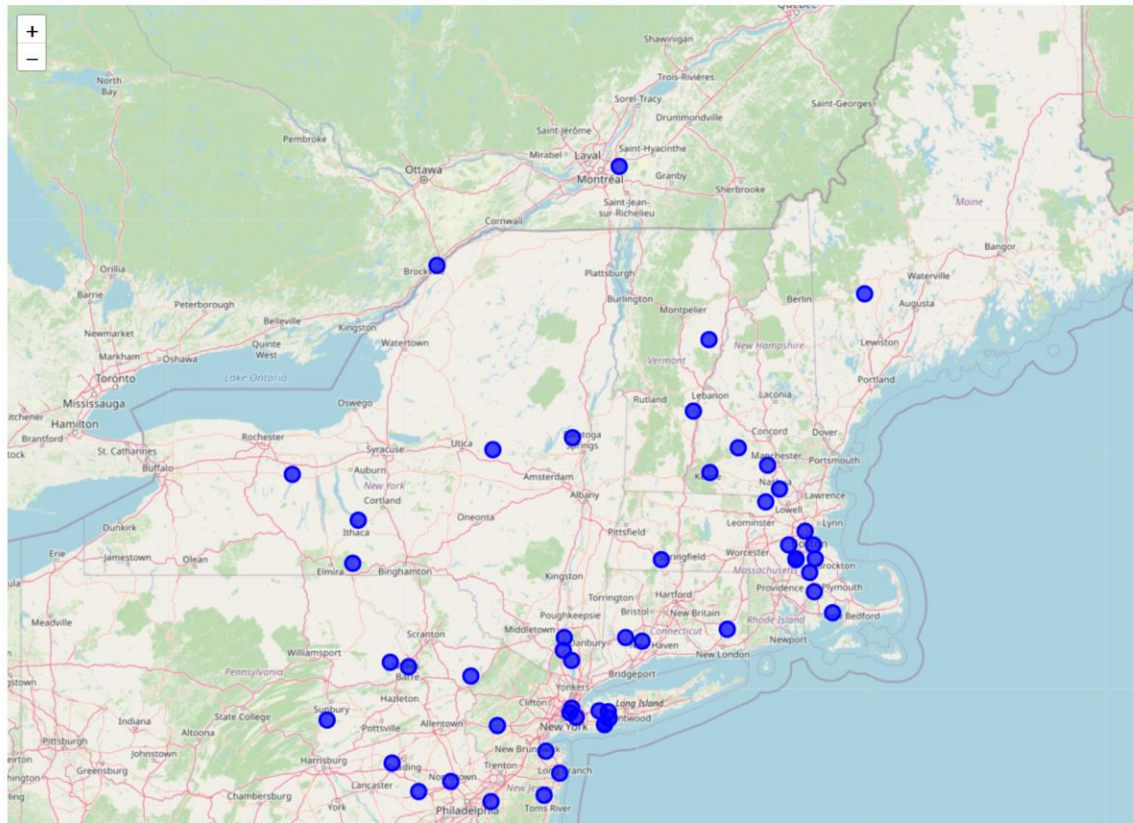
See where iGates, Repeaters, Digipeaters, DSTAR, Winlink nodes, BBS were heard in your area, along with when they were last heard and other information such as electricity, radio type and transmit power.

Filter and track a subset rather than everything heard.

Blue=participants, Yellow-Priority, Green-Infra, Purple-Objects

APRS Explorer

Information about APRS stations, infrastructure and objects.



APRS resource type: Stations

Resources

Callsign	Name	Status	Lat	Lon	Radio Type	Transmit Power	Last Heard
AA1PR	AA1PR	UP			UNKNOWN	0	2025-11-28 09:19:27
AB1HN-1	AB1HN-1	UP	4126.72N	07316.29W	UNKNOWN	0	2025-11-28 15:15:07
AB3ZZ	AB3ZZ	UP	4038.78N	07448.56W	UNKNOWN	0	2025-11-24 21:57:08
AC2MI-10	AC2MI-10	UP			UNKNOWN	0	2025-11-28 14:45:25
AD2KJ	AD2KJ	UP			UNKNOWN	0	2025-11-26 21:47:18
AD2KJ-1	AD2KJ-1	UP	9000.00N	18000.00W	UNKNOWN	0	2025-11-28 10:21:42
AD3O-3	AD3O-3	UP			UNKNOWN	0	2025-11-28 15:09:26
AE1P	AE1P	UP	4254.65N	07215.13W	UNKNOWN	0	2025-11-28 15:07:28
AX167	AX167	UP			UNKNOWN	0	2025-11-28 12:03:35
ER-KD2NFC	ER-KD2NFC	UP			UNKNOWN	0	2025-11-28 15:08:52

rows per page: 10 1-10 of 196

[Details](#) [APRS Status](#) [Actions](#)

Name: AB1HN-1
Description:
Status: UP
Location: 4126.72N / 07316.29W
Electrical Power: UNKNOWN / UNKNOWN
Radio style: UNKNOWN
Transmit power: 0W
Tracked? false
Last heard: 2025-11-28 15:15:07

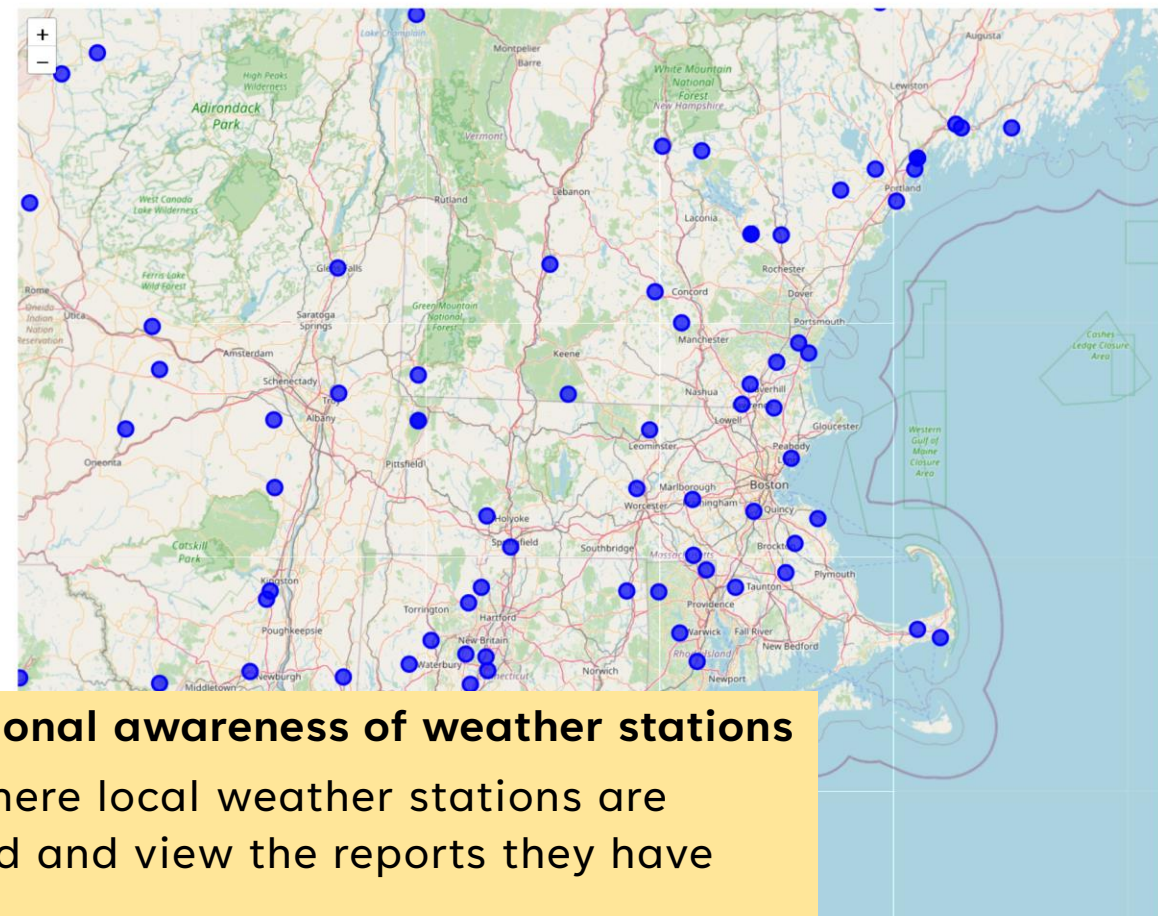
Situational awareness of stations

See where stations were heard in your area, along with when they were last heard and other information such as electricity, radio type and transmit power.

Filter and track a subset rather than everything heard.

APRS Explorer

Information about APRS stations, infrastructure and objects.



APRS resource type: Weather Stations

Resources							
Callsign	Name	Status	Lat	Lon	Radio Type	Transmit Power	Last Heard
AA1FF	AA1FF	UP	4152.92N	07154.94W	UNKNOWN	0	2025-11-28 15:14:19
AB1AU	AB1AU	UP	4433.47N	06938.36W	UNKNOWN	0	2025-11-28 15:16:40
AB2HM	AB2HM	UP	3948.88N	07508.89W	UNKNOWN	0	2025-11-28 14:49:42
AC1DX	AC1DX	UP	4250.29N	07310.22W	UNKNOWN	0	2025-11-28 15:15:02
AC2GC-13	AC2GC-13	UP	4122.20N	07344.47W	UNKNOWN	0	2025-11-28 15:12:37
AJ1L	AJ1L	UP	4205.64N	07054.25W	UNKNOWN	0	2025-11-28 15:16:31
AX167	AX167	UP	4640.65N	07146.38W	UNKNOWN	0	2025-11-28 15:07:52
AX167	AX167	UP	4640.65N	07146.38W	UNKNOWN	0	2025-11-27 11:50:34
EMGATE	EMGATE	UP	4618.38N	07233.58W	UNKNOWN	0	2025-11-28 15:17:42
K1ABC	K1ABC	UP	4258.88N	07053.13W	UNKNOWN	0	2025-11-28 15:03:29
rows per page: 10 1-10 of 191 1 2 3 18 19 20							

Details APRS Status Latest Weather Past Weather Actions

Temperature

34F

2025-11-28 15:03:29

Atmosphere

Humidity: 0 %
Pressure: 0 mb
Wind: 2 MPH 260 degrees
Gust: 10 MPH

Precipitation

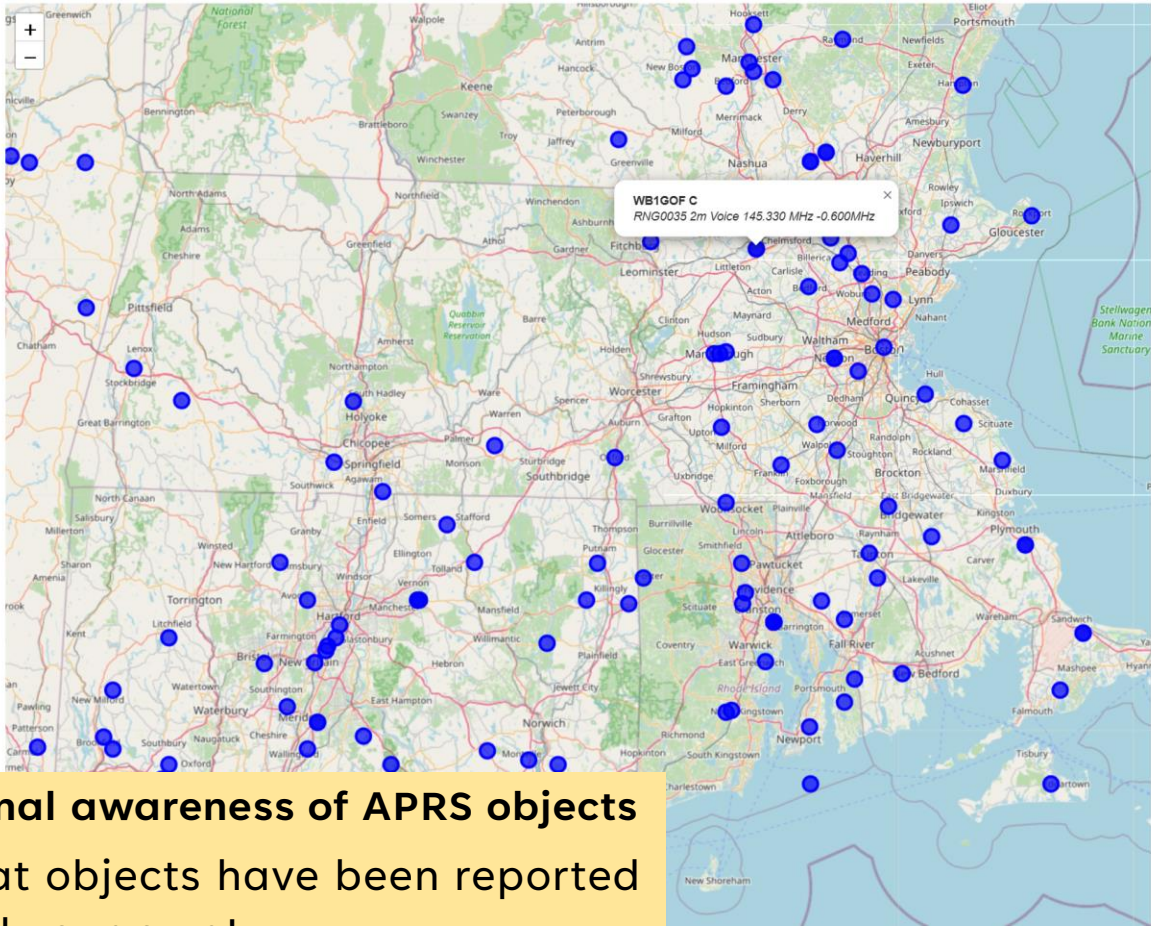
Last hour: 0 inches
Last day: 0 inches
Since 00:00: 0 inches
Snow: 0 inches

Situational awareness of weather stations

See where local weather stations are located and view the reports they have sent.

APRS Explorer

Information about APRS stations, infrastructure and objects.



APRS resource type: Objects

Resources

Callsign	Name	Status	Lat	Lon	Radio Type	Transmit Power	Last Heard
WA2EPI B	WA2EPI B	Alive	4052.97N	7434.15W			2025-11-28 10:51:35
WA2GUG-10	WA2GUG-10	Alive	4221. N	7402. W			2025-11-28 16:11:16
WA2NAN-1	WA2NAN-1	Alive	4414.43N	7505.67W			2025-11-28 13:56:58
WA2RES-14	WA2RES-14	Alive	3945.62N	7415.64W			2025-11-28 16:23:08
WA2RES-15	WA2RES-15	Alive	3954.30N	7414.06W			2025-11-28 16:26:07
WA3SWJ B	WA3SWJ B	Alive	4143.47N	7005.50W			2025-11-28 16:15:32
WA3WLH-10	WA3WLH-10	Alive	4023. N	7532. W			2025-11-28 16:11:19
WB1GOF B	WB1GOF B	Alive	4234.61N	7126.55W			2025-11-28 16:27:53
WB1GOF C	WB1GOF C	Alive	4234.61N	7126.55W			2025-11-28 16:27:53
WB2LJK/P	WB2LJK/P	Alive	4049.36N	7525.34W			2025-11-28 14:40:43

rows per page: 10561-570 of 59415657585960

DetailsActionsAPRS Status

Name: WB1GOF C
Status: Alive
Location: 4234.61N / 7126.55W
Comment: RNG0035 2m Voice 145.330 MHz -0.600MHz
Last heard: 2025-11-28 16:27:53
Type: STANDARD

Situational awareness of APRS objects

See what objects have been reported and add your own!

RULES-BASED RESOURCE CLASSIFIER

Upon APRS packet receipt, a rules-based resource classifier is run against the message and a set of user-defined rules to determine a resource's types.

- **Source** – callsign, comment, status or symbol code/id
- **Action** – contains, equals, starts-with, ends-with
- **Value** – value contained in source
- **Resource Type** – what resource type the callsign is

Resources can be of more than one type (example: Digipeater / iGate)

Setup

Configuration settings for Net Central.

- Announcements
- Federation
- Map
- Map Cache
- Net Manager
- Resource Rules
- Transceivers
- Users
- Timers

Net Central server evaluates APRS data to assign resource types to heard stations. You can configure those rules here.

Create New Rule

Source	Action	Value	Station Type
STATUS	CONTAINS	WX3IN1	DIGIPEATER
STATUS	CONTAINS	WX3IN1	IGATE
COMMENT	CONTAINS	WX3IN1	DIGIPEATER
COMMENT	CONTAINS	WX3IN1	IGATE
STATUS	CONTAINS	BBS	BBS
STATUS	CONTAINS	(D-STAR)	DSTAR
STATUS	CONTAINS	DIGI	DIGIPEATER
STATUS	CONTAINS	MMDVM	MMDVM
STATUS	CONTAINS	APRS IGATE	IGATE
STATUS	CONTAINS	APRS_IGATE	IGATE
rows per page: 10 1-10 of 24 < 1 2 3 >			

Rules-based classifier

All rules are run against packets as they are received to determine all possible resource types.

APRS Explorer

Information about APRS stations, infrastructure and objects.

No map available.

Auto-update: Off
[Turn on](#)

Catalog heard call signs and identify operators
Uses WHO-15 to request callsign information and passively listens for messages from WHO-15/IS to others who ask for identification information.

APRS resource type: Callsigns

Resources

Callsign	Name	State	Country	License
AA2RG				
AA2T				
AA2TR				
AA3E				
AA3JC				
AB1AU				
AB1HN				
AB1JC				
AB1KI				
AB1PH	Don Rolph	MA	United States	Extra

rows per page: 10 11-20 of 1823 < 1 2 3 ... 181 182 183 >

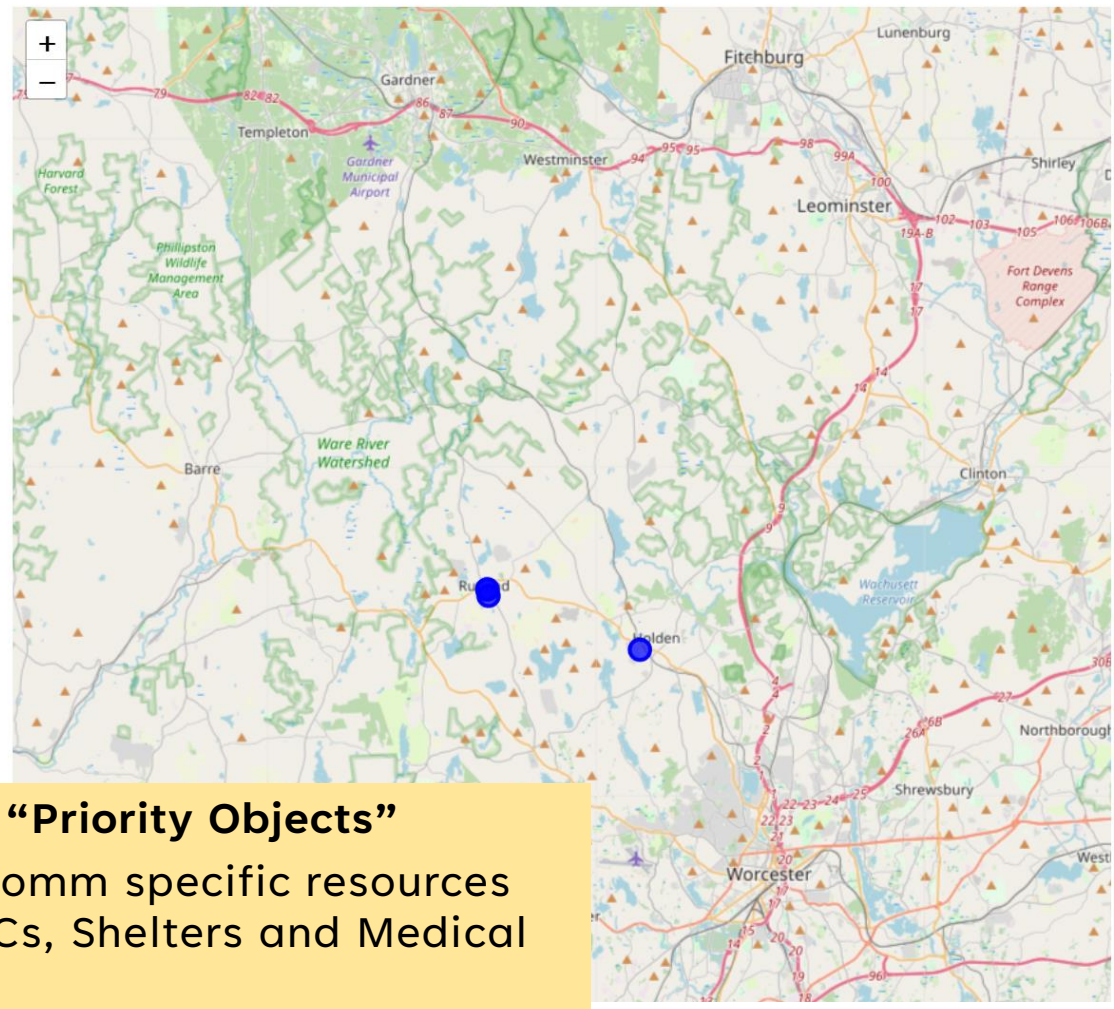
[Details](#) [APRS Status](#) [Actions](#)

Name: Don Rolph
Description:
Status: Heard
Location: /
Electrical Power: /
Radio style:
Transmit power: W
Tracked?
Last heard:

APRS Explorer

Information about APRS stations, infrastructure and objects.

APRS resource type: Priority Objects



Resources

Callsign	Name	Type	Status	Last Heard
TESTEO-2	TESTEO-2	EOC	Alive	2025-10-11 21:23:39
TESTSH-2	TESTSH-2	SHELTER	Alive	2025-10-11 20:23:43
TSWRHS-1	TSWRHS-1	SHELTER	Alive	2025-10-02 19:31:30
TESTRD-1	TESTRD-1	EOC	Alive	2025-10-08 18:25:11

rows per page: 10 1-4 of 4

- Details
- Mobilization
- Mobilization History
- Contacts
- Contact History
- Access
- Actions

Name: TESTEO-2
Status: Alive
Location: 4222.53N / 07157.19W
Comment: test EOC
Last heard: 2025-10-11 21:23:39
Type: EOC

Interactive “Priority Objects”
Model EmComm specific resources
such as EOCs, Shelters and Medical
Facilities.

INTERACTIVE “PRIORITY OBJECTS”

These objects model EmComm resources such as:

- Emergency Operation Centers
- Shelters
- Medical Facilities

Information specific to each can be reported by the object using user-defined APRS reports.

Information can be provided using Net Central's web application, or by sending messages to the object's callsign.

This allows almost any operator to interact with these objects from any APRS client or radio capable of sending messages.

INTERACTIVE “PRIORITY OBJECTS”

Messages sent to the object’s callsign are interpreted by Net Central.

If they conform to the syntax specific to each object type and report type, the information is retained and then re-broadcast using a user-defined report for others to be aware.

APRS clients can send a message “REPORT” to the callsign, and Net Central will send back all reports for that callsign.

```
2025-10-21 20:06:20 EDT: KC1VMZ-15>TESTRF-4: REPORT
```

```
2025-10-21 20:07:34 EDT: TESTRF-4>KC1VMZ-15: Contacts: John R:KC1VMZ:20251021
```

```
2025-10-21 20:07:41 EDT: TESTRF-4>KC1VMZ-15: MobStatus: 2120251021test Rutland
```

INTERACTIVE “PRIORITY OBJECTS”

For added protection, each object can be configured to only listen to a certain set of callsigns for updates:

- Specific callsign
- Participants in a specific net
- Any net participant

Details Mobilization Mobilization History Contacts Contact History Access Actions

Only the following callsigns have the ability to send report updates:

Callsign	Type	Allowed	Proximity
*	NET	true	
rows per page: 10 ▼ 1–1 of 1 < >			

Add

INTERACTIVE “PRIORITY OBJECTS”

Additional safeguards will be added to restrict stations also be proximity (geofencing)

For example, any net participant could potentially provide information about a shelter, but they must be within 100 yards of the object’s location.

The behavior of these objects, and the use of security measures such as these, are fairly unique in the APRS world.

INTERACTIVE “PRIORITY OBJECTS”

EOCs

Mobilization information

- Incident name
- Status (Normal, Partial Full)

Contact information

- Director name
- Incident commander name

Details Mobilization Mobilization History Contact History Access Actions

Historical contact information:

Time	EOC Director	Incident Commander
2025-10-10 17:23:31	John Rokicki	John C Rokicki
2025-10-11 21:26:15	JohnR	JohnCR
2025-10-12 12:59:06	Mickey	Minnie

Details Mobilization Mobilization History Contact History Access Actions

Historical mobilization information:

Time	EOC Name	Status	Level
2025-10-12 13:00:32	test Rutland dialog entry	NORMAL	0
2025-10-12 09:15:02	Test sunday EOC	NORMAL	1
2025-10-11 21:27:49		NORMAL	1
2025-10-12 10:47:57	Test watch report	NORMAL	1
2025-10-12 10:34:06	EOC report test	NORMAL	1
2025-10-12 10:37:24	test report send	NORMAL	1
2025-10-11 21:29:05	Test EOC using Net Central	NORMAL	1

rows per page: 10 1-7 of 7

INTERACTIVE “PRIORITY OBJECTS”

Shelters

Status information

- Status (Stand-by, Active)
- State (Open, Closed)

Population census by age cohort

Worker census by job category

Food and materiel availability and needs

Details Operational Status Census Census History Workers Food Materiel Access ⋮

Historical census information:

Time	Age 0-3	Age 4-7	Age 8-12	Age 13-18	Age 19-65	Age 66+
2025-10-11 20:59:31	5	10	15	20	20000025	30
2025-10-10 18:05:56	1	2	3	4	5	6
2025-10-10 18:05:56	7	8	9	10	11	12
2025-10-10 18:05:56	13	14	15	16	17	18
2025-10-12 14:46:10	1	2	3	4	5	6
2025-10-11 21:01:54	5	10	15	20	25	30

Details Operational Status Census Census History Workers Food Materiel Access ⋮

Latest worker census:

Classification	First Shift	Second Shift	Third Shift
Health	2	3	5
Mental	4	6	10
Spiritual	6	9	15
Case Worker	8	12	20
Feeding	10	15	25
Other	12	18	30

Last report: 2025-10-12 15:50:51 2025-10-11 21:10:53 2025-10-12 15:56:28

INTERACTIVE “PRIORITY OBJECTS”

Soon to be supported objects are:

Medical Facility

Wide open currently

Would model from Winlink reports (beds, workers, blood, etc)

What else would you like to have?

INTERACTIVE “GENERAL RESOURCES”

These objects model anything you want:

- Gas Station
- ATM
- Dunkin Donuts
- Whatever is important to you!

Each object maintains its own set of data – key/value pairs – that can be read or written by sending its callsign commands.

Key / value pairs can be reported similarly to station capabilities – choose to broadcast or not.

Create object

Create a general APRS object or Net Central Priority Object.

Callsign:

Description:

Voice Frequency:

Object type: General Resource

Create

Standard

Shelter

Medical

Emergency Operations Center (EOC)

General Resource

Resources

Callsign	Name	Status	Lat	Lon	Radio Type	Transmit Powe
TESTDD-1	TESTDD-1	Alive	4222.55N	07157.26W		

Details APRS Status Data Access Actions

General Resource Data:

Key	Value	Broadcast
type	Dunks	true
Donuts	Yes	false
Coffee	Yes	true

INTERACTIVE “GENERAL RESOURCES”

Information can be provided using Net Central’s web application, or by sending messages to the object’s tactical callsign.

The APRS client syntax is simple:

Key=value – creates or updates a key/value pair

Key= – deletes a key/value pair

Key – Net Central will send the value back to the client

REPORT – Net Central will send back all key/value pairs to the client

This allows any operator to interact with these objects from any APRS client or radio capable of sending messages.

Dashboard

Current statistics for Net Central



Nets

2 Active Nets
0 Active net participants

0 Nets started
0 Nets secured

26 Completed Nets
46 Completed net participants



Stations

794 Stations heard
134 Digipeaters heard
310 iGates heard
0 Internet Servers heard
310 Repeaters heard
8 Weather Stations heard
1 Winlink Stations heard
1 Bulletin Boards heard
333 Others heard

0 Tracked Stations

380 Callsigns heard



Users

3 Users
2 Users currently logged in

3 User logins
2 User logouts



Communications

1 Registered transceivers
1 Enabled for receive
1 Enabled for transmit

120 Objects received
5 Objects sent
0 Messages sent
0 Acks requested
0 Acks sent
10 Seconds since receiving message
297 Seconds since sending message



Operations

10 minutes since started
0 minutes since heartbeat Report Cleanup Thread fired
0 minutes since heartbeat Scheduled Net Thread fired
0 minutes since heartbeat Object Beacon Thread fired
0 minutes since heartbeat Net Participant Reminder Thread fired

Dashboard to quickly view activity

See quickly what is going on with Net Central and APRS in your area.

Net Central

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools**
- Setup
- Logout

Auto-update: On

Turn off

Version
v1.0.24

Tools

Net Central provides a set of integrated APRS tools that you can use independently from nets.

Send NTS Radiogram

Send an NTS Radiogram via APRS to NTS Gateway NTSGTE.

Send Winlink Email

Send a Winlink email via APRS to Winlink Gateway WLNK-1.

**Enable raw packet
logging**

Enable raw logging of all heard packets for later download.

Download raw packets

Download all heard APRS packets to a file.

Delete raw packets

Delete all logged raw packets.

Delete all APRS data

Delete all heard APRS data so you can start fresh.

**Delete all Net Central
data**

Delete all Net Central data (nets, archives, etc.) so you can start fresh.

Additional Tools

Utilize other APRS integration services such as NTS Radiogram and Winlink gateways

Net Central

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

Send NTS Radiogram

Number	Precedence	HX	Station of origin	Place of origin	Check	Time filed	Date filed
2	R		KC1VMZ	Rutland MA	4		Oct 24

To: John Rokicki

Street Address: 17 Prouty Lane

City, State: Rutland MA

Phone number:

Email address: kc1vmz@gmail.com

Message:

This is a test

Signature: john KC1VMZ

Operator note:

teway NTSGTE.

teway WLNK-1.

NTS Radiograms

Send a radiogram from the Net Central console.

2025-10-24 19:05:45 EDT: **KC1VMZ>NTSGTE**: NA\JOHN ROKICKI\17 PROUTY LANE\RUTLAND\
2025-10-24 19:05:45 EDT: **KC1VMZ>NTSGTE**: NP\5089811059
2025-10-24 19:05:46 EDT: **KC1VMZ>NTSGTE**: NE\KC1VMZ ATSIGN GMAIL DOT COM
2025-10-24 19:05:46 EDT: **KC1VMZ>NTSGTE**: N1\WELCOME NET CENTRAL TO NTS
2025-10-24 19:05:47 EDT: **KC1VMZ>NTSGTE**: N2\EXCLAMATION 73 NET TRAFFIC HEROS
2025-10-24 19:05:47 EDT: **KC1VMZ>NTSGTE**: NS\JOHN KC1VMZ
2025-10-24 19:05:52 EDT: **NTSGTE>KC1VMZ**: Roger message 1
2025-10-24 19:05:54 EDT: **NTSGTE>KC1VMZ**: KC1VMZ de NTSGTE 73, thanks for using NTSGTE.

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools**
- Setup
- Logout

Tools

Net Central provides a set of integrated AF

Send NTS Radiogram

Send Winlink Email

Send Winlink Message

Your Winlink callsign:

KC1VMZ

Your Winlink password:

.....

Recipient:

kc1vmz@gmail.com

Subject:

test

Message:

This is a test message.
Unfortunately I don't know how to make line breaks
carry over to email.

Send

Cancel

APRS to NTS Gateway NTSYTE.

S to Winlink Gateway WLNK-1.

Winlink Email

Send a short (or long!) email via Winlink.

```
2025-10-24 20:00:11 EDT: KC1VMZ>WLNK-1: Net Central login request from KC1VMZ
2025-10-24 20:00:12 EDT: WLNK-1>KC1VMZ: Login [743]:
2025-10-24 20:00:24 EDT: WLNK-1>KC1VMZ: Hello KC1VMZ. Login valid for ~2 hours
2025-10-24 20:00:24 EDT: KC1VMZ>WLNK-1: sdetAa
2025-10-24 20:00:54 EDT: KC1VMZ>WLNK-1: SP kc1vmz@gmail.com test subject
2025-10-24 20:00:54 EDT: WLNK-1>KC1VMZ: New message to: kc1vmz@gmail.com. Send /EX when complete.
2025-10-24 20:00:54 EDT: KC1VMZ>WLNK-1: This is a much longer test so that it does not use
2025-10-24 20:00:54 EDT: KC1VMZ>WLNK-1: the the SMS feature but a set of several commands
2025-10-24 20:00:55 EDT: KC1VMZ>WLNK-1: repeatedly. Lets hope for the best!
2025-10-24 20:00:55 EDT: KC1VMZ>WLNK-1: /EX
2025-10-24 20:00:55 EDT: WLNK-1>KC1VMZ: Message sent to: kc1vmz@gmail.com
2025-10-24 20:00:56 EDT: KC1VMZ>WLNK-1: BYE
2025-10-24 20:00:56 EDT: WLNK-1>KC1VMZ: Log off successful
```

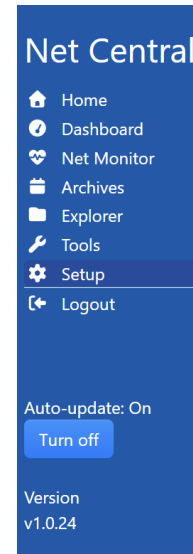
```
2025-10-24 19:49:54 EDT: KC1VMZ>WLNK-1: Net Central login request from KC1VMZ
2025-10-24 19:49:54 EDT: WLNK-1>KC1VMZ: Login [514]:
2025-10-24 19:51:20 EDT: KC1VMZ>WLNK-1: hbMHed
2025-10-24 19:51:20 EDT: WLNK-1>KC1VMZ: Hello KC1VMZ. Login valid for ~2 hours
2025-10-24 19:52:27 EDT: KC1VMZ>WLNK-1: SMS kc1vmz@gmail.com this is a test!
2025-10-24 19:52:27 EDT: WLNK-1>KC1VMZ: Message sent to: kc1vmz@gmail.com
2025-10-24 19:52:28 EDT: KC1VMZ>WLNK-1: BYE
2025-10-24 19:52:28 EDT: WLNK-1>KC1VMZ: Log off successful
```

OFFLINE MAP USE

Net Central supports use of offline OpenStreetMap map tiles.

Use Net Central to view interested map areas and detail depths while online.

Simply change setting to run in cache mode and it will only use locally cached versions.

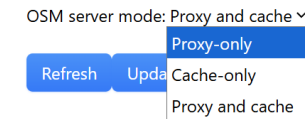


Setup

Configuration settings for Net Central.

Announcements Federation Map Map Cache Net Manager Resource Rules Transceivers Users Timers

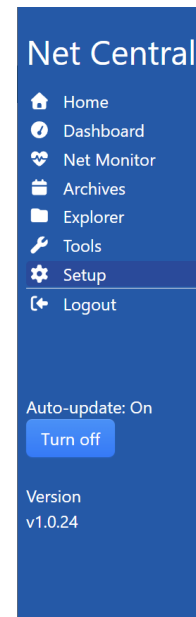
Net Central retrieves map information from an OpenStreetMap server. It can be configured as a proxy, a cache, or both. To use in offline situations, configure as a cache only. Map information must have been previously viewed and cached.



NET MANAGEMENT OVER APRS

Net Central supports net management over APRS!

Configure Net Central to have a Net Management callsign and a location, and APRS messages can be sent to that callsign to manage ad-hoc nets.



Setup

Configuration settings for Net Central.

Announcements Federation Map Map Cache Net Manager Resource Rules Transceivers Users Timers

Net Central can have its nets remotely administered via APRS. You can configure those parameters here.

Enabled:

Net Manager Callsign:

Latitude:

Longitude:

NET MANAGER COMMANDS

**Commands that can be sent to the Net Manager
callsign:**

L - List the active public nets hosted by this Net Central server

C callsign - Create a public net with the provided callsign.

CP callsign - Create a private net with the provided callsign.

S - Secure an ad-hoc net

H - display help message of all commands

USER ROLES

User

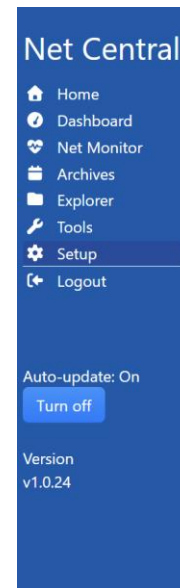
- View information

Administrator

- Create, modify and delete nets and objects
- Configure the application
- Configure priority object permissions

System administrator

- Reset data



Setup

Configuration settings for Net Central.

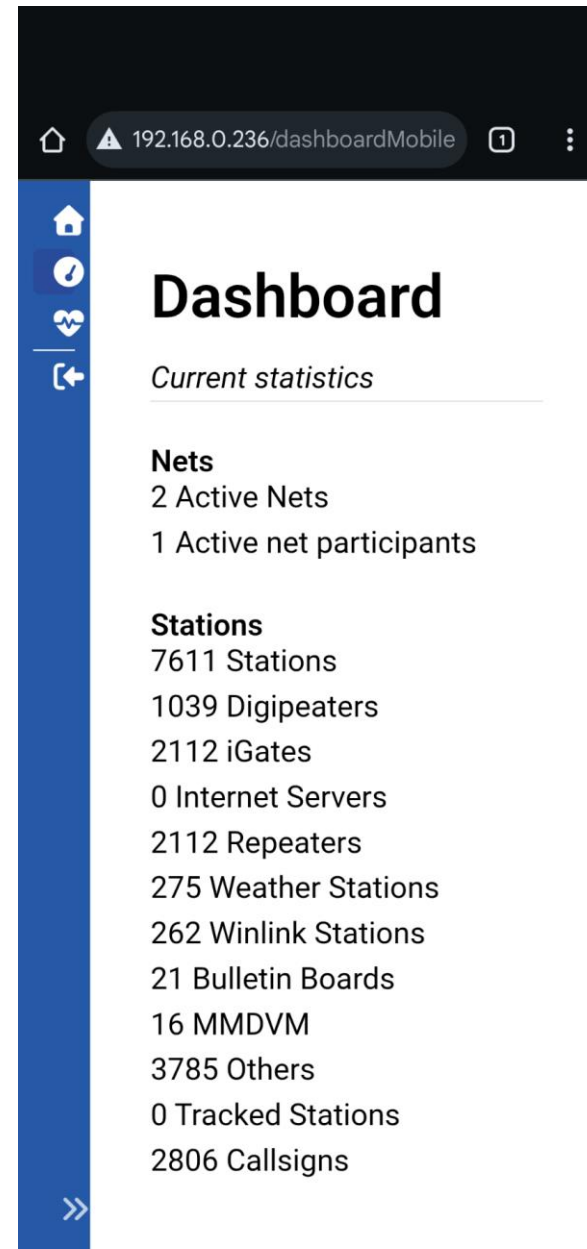
Announcements Federation Map Map Cache Net Manager Resource Rules Transceivers Users Timers

Net Central server maintains a set of users and their privileges. They are listed here and their properties and behaviors can be modified by selecting one in the list.

Login ID	callsign	Role
jcrokicki@gmail.com	KC1VMZ	SYSADMIN
serviceAccount		SYSADMIN
serviceUser		ADMIN
		rows per page: 10 < 1 >

MOBILE-CENTRIC APP

- Monitor net activity on Net Central from a mobile device.
- View active nets, participants and messages.
- See basic dashboard statistics
- Get a list of radio commands (home page)



FEDERATED SYSTEMS

- Net Central can be configured to run in “Federated” mode
- All objects and nets managed by one Net Central server are recognized by any other Net Central servers who can hear the originating server.
- Non-originating Net Central servers can see nets, their participants, messages, questions and answers.
- Non-originating Net Central servers can identify priority objects and provide type-specific information rather than being treated as generic objects.
- All data is read-only for non-originating Net Central servers to allow for situational awareness.

PACKET LOGGING

Transceiver modules can be configured to log all received packets to a file.

```
Command Prompt
VA2PGN-7>APBPQ1,TCPIP*,qAC,SIXTH: !4608.07NI07038.80W&St-Georges,QC
KC2ANT-1>BEACON,qAR,N3TJJ-13:;146.97-/R*111111z4223.10N/07640.10Wr146.970MHz C103 -060 R30m Skywarn/R NetSun8pm
N3EYQ>APRS,TCPIP*,qAC,SIXTH:@130206z4152.88N/07403.40W_000/000g000t042r000P000p000h72b10069v2
N3HTZ-9>TP1P1T,WIDE1-1,WIDE2-1,qAR,N3XKU-7: `fN}lT9>/` "4E}_%
W2SLK-S>APDG01,TCPIP*,qAC,W2SLK-GS:;W2SLK M *130206z4419.68ND07408.40WArNG0001/A=000010 70cm Voice (D-Star) 441.60000MHz +5.0000MHz
N3TJJ-12>APMI06,qAR,W3PC-1:;146.64-PG*111111z4030.39N/07622.60Wr146.640MHz C082 -060 AARG
W1ATD-R>APDG04,TCPIP*,qAC,W1ATD-RS: !4206.67ND07042.26W&/A=0000002m MMDVM Voice (NXDN) 145.39000MHz -0.6000MHz, W1ATD_Pi-Star_RPT
# aprsc 2.1.19-g730c5c0 13 Nov 2025 02:06:42 GMT T2LANE 44.26.110.252:14580
W1OT-12>APLRT1,WIDE1-1,qAR,W1OT-2:!/93[&<C2[[@mQ
N3OBQ>SYST3W,N3KTX-7,WIDE2*,qAR,K3ORB-10: 'h\81 L_/_]
KC2G>APDW17,TCPIP*,qAC,T2SJC:T#131,092,059,000,000,030,00000000
K2MKD>APW11,TCPIP*,qAC,T2CHILE:<IGATE,MSG_CNT=243,LOC_CNT=19,DIR_CNT=1,RF_CNT=57,DX=5*KC2OUR-1(41mi@167m)
K2HF>APRS,TCPIP*,qAC,NINTH:@130206z4101.17N/07232.90W_189/000g004t047r000p000P000b10067h60eMB33
N2MH-15>APRX29,TCPIP*,qAC,T2PR:T#556,41.5,15.3,186.0,73.0,58.0,00000000
GRYLCP-11>APW11,HOP7-7,HOP7-7,qAR,AB1PH-15:@020643h4208.85N/07113.61WeAB1PH for ATGP using APRS-IS for Win32
W0JAY-10>APSN01,TCPIP*,qAC,T2ALBERTA:=4124.57N/07304.02W#CSN iGate
KA2NDW-1>APNX01,qAR,W2CXM: !4259.30N/07656.20W#PHG5200/W2 digi
N1UB-1>APMI06,W1EMA-1*,WIDE2-1,qAO,N1BGR-10:@130118z4458.22N/06939.24W#WX3in1Plus2.0 U=14.1V,T=0.0C/32.0F
KC3JUG-13>APMI06,TCPIP*,qAS,KC3JUG:@130206z4006.62N/07557.76W_272/002g003t045r000p000P000h70b10127WX3in1 weather
KC1TPO-5>APN000,WIDE1-1,qAR,WIDMR-4:=4155.24N/07113.81Wk353/000/A=000124
VE2SIL-1>APU25N,TCPIP*,qAC,T2QUEBEC:>130206zNo stations have been heard except via a digipeater.
N1IIM-1>EDAS8R,WIDE1-1,qAR,KA1GJU-3: `bV%l x-/` "4N}145.150MHz Monitoring on _4
```

PACKET LOGGING

Net Central can be configured to retain raw packets and allow you to download from the web user interface

Tools

Net Central provides a set of integrated APRS tools that you can use independently from nets.

Send NTS Radiogram		Send an NTS Radiogram via APRS to NTS Gateway NTSGTE.
Send Winlink Email		Send a Winlink email via APRS to Winlink Gateway WLNK-1.
Enable raw packet logging	←	Enable raw logging of all heard packets for later download.
Download raw packets	←	Download all heard APRS packets to a file.
Delete all APRS data		Delete all heard APRS data so you can start fresh.
Delete all Net Central data		Delete all Net Central data (nets, archives, etc.) so you can start fresh.

DIRECTED STATION QUERIES

APRS has standard way of interrogating callsigns for information – a directed station query.

Each resource managed by Net Central has its own set of valid directed queries.

Net

- ?INFO - returns net info and participants
- ?CMD - returns list of valid directed query commands
- ?APRSO - returns object information
- ?APRSP - returns object position
- ?APRSS - returns object status
- ?NCNTI - returns net info
- ?NCNTP - returns net participants

DIRECTED STATION QUERIES

Priority Object - EOC

- ?INFO - returns name, comment and supported directed query commands
- ?CMD - returns list of valid directed query commands
- ?APRSO - returns object information
- ?APRSP - returns object position
- ?APRSS - returns object status
- ?NCPI - returns name, comment
- ?NCPES - returns EOC status
- ?NCPEM - returns EOC mobilization report

DIRECTED STATION QUERIES

Priority Object - Shelter

- ?INFO - returns name, comment and supported directed query commands
- ?CMD - returns list of valid directed query commands
- ?APRSO - returns object information
- ?APRSP - returns object position
- ?APRSS - returns object status
- ?NCPI - returns name, comment
- ?NCPSS - returns shelter status
- ?NCPSC - returns shelter census
- ?NCPSF - returns shelter food reports
- ?NCPSM - returns shelter materiel reports
- ?NCPSW - returns shelter worker census reports

DIRECTED STATION QUERIES

General Resource Object

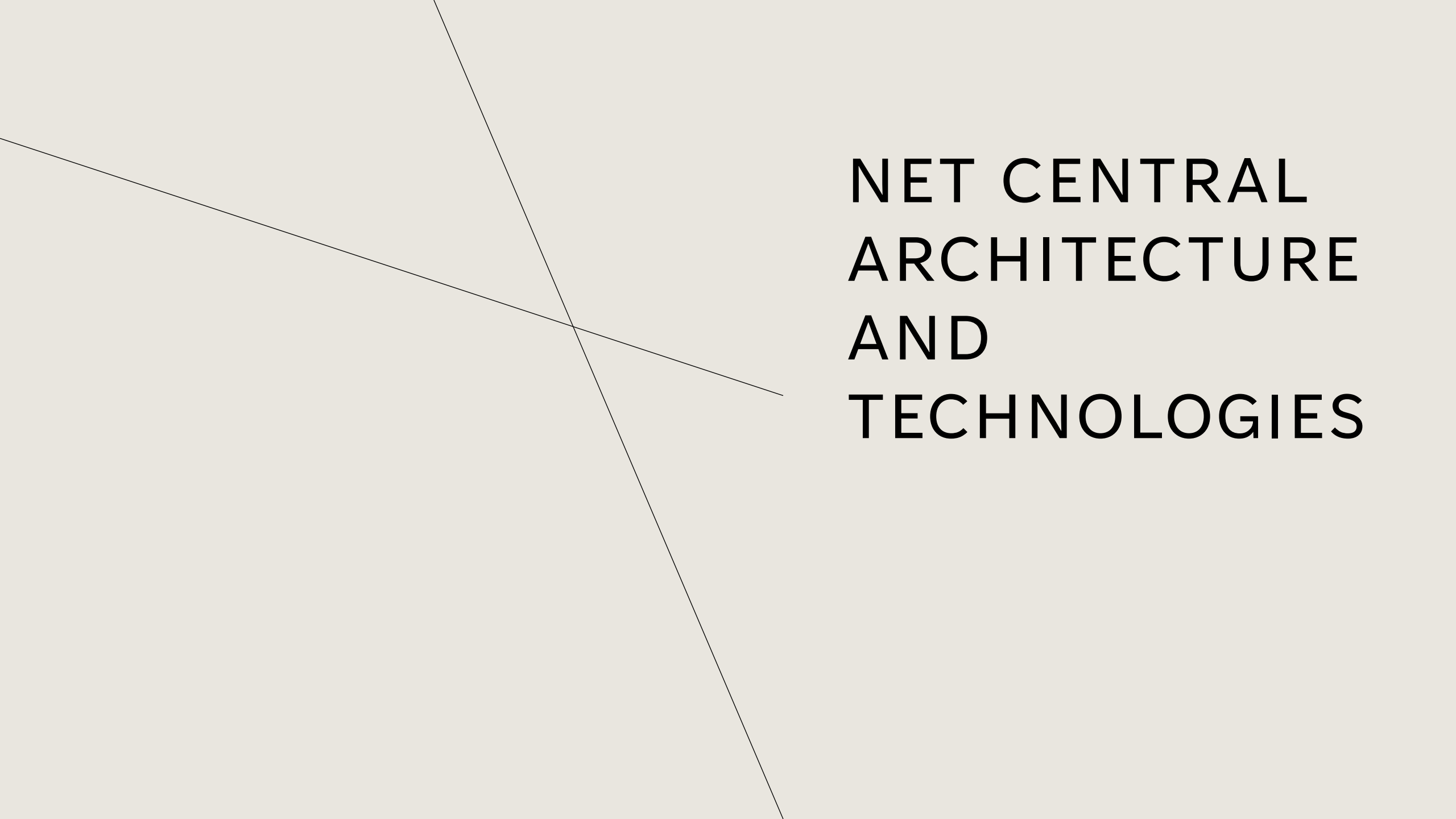
- ?INFO - returns name, comment and supported directed query commands
- ?CMD - returns list of valid directed query commands
- ?APRSO - returns object information
- ?APRSP - returns object position
- ?APRSS - returns object status
- ?NCGRI - returns name, comment
- ?NCGRV - returns token=value pairs stored for object

UNDER CONSTRUCTION

- Additional Priority Objects such as medical facilities, incident locations, etc.
- Using Lifeline status for incidents
- Send Winlink reports via Winlink for Priority Objects
- Skywarn – how to enhance?
- Power outage reporting:
 - Example: model http://mema.mapsonline.net/power_outage_public.geojson in APRS
- What else?

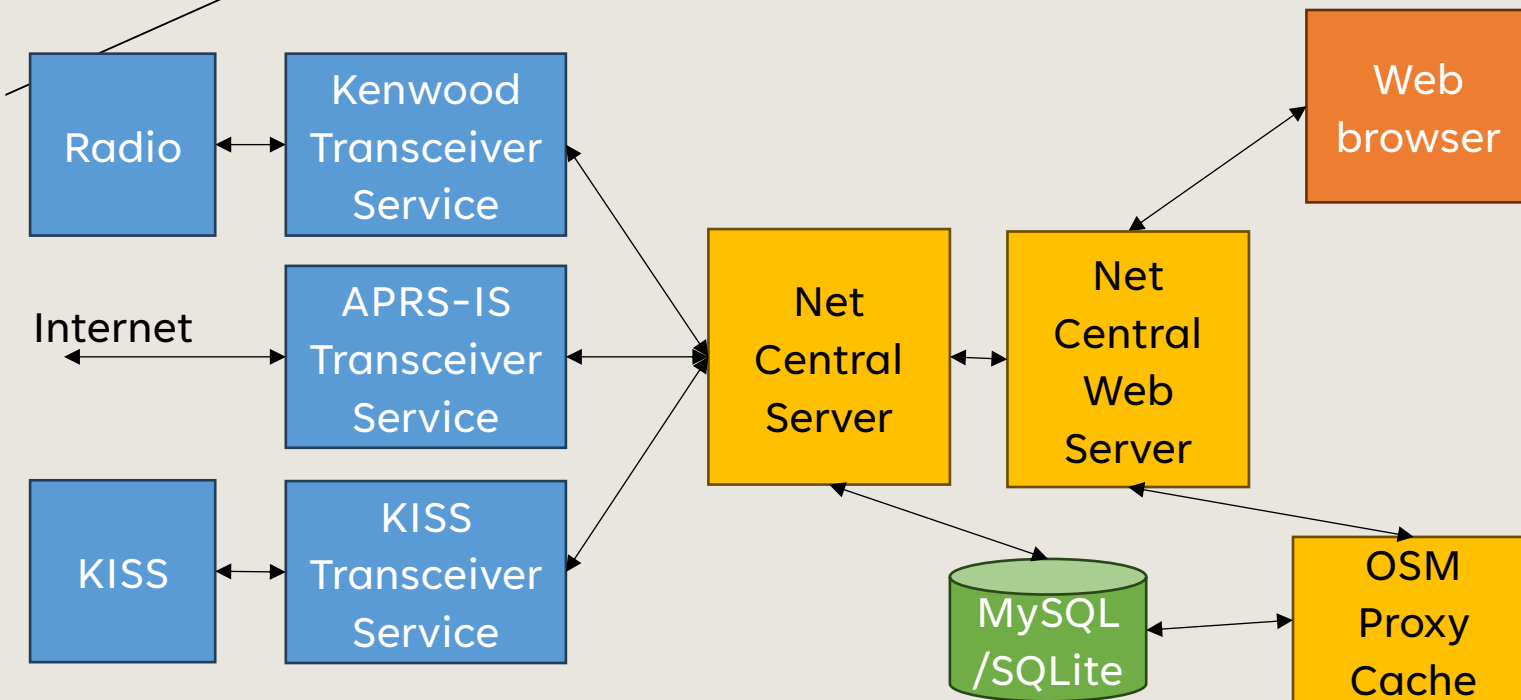
SIDE DREAMS

- My motivation is to create improved APRS tools for Emergency Communications. But this can be used just for fun by anyone 😊
- I'd love this to spawn one or one hundred new ideas!



NET CENTRAL ARCHITECTURE AND TECHNOLOGIES

NET CENTRAL ARCHITECTURE



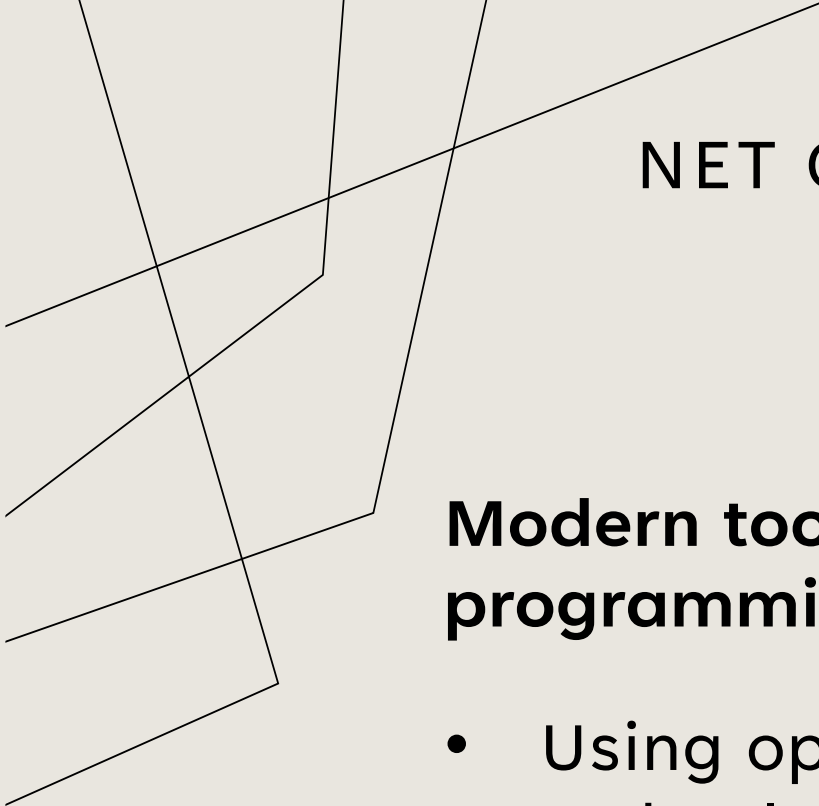
Modern architecture

Net Central is a REST-based microservice architecture.

Transceiver modules handle technology-specific communication and send consistent information to Net Central REST end points.

Services can run on the same or multiple systems connected over a LAN.

Each transceiver is optional and can be configured for send and receive.



NET CENTRAL TECHNOLOGIES

Modern tools and programming languages

- Using open-source technologies
- Open source licensed under GPL v3.
- Available on Github
- Built from source or install from pre-built binaries.

Technologies used

- Java 17
- Micronaut
- Vue3
- MySQL / SQLite database
- javAPRSlib
- Leaflet



IN THE FIELD – ATGP 2026

IN THE FIELD – ATGP 2026

Appalachian Trail Golden Packet

www.atgoldenpacket.net

Licensed amateur radio operators coordinate 15+ sites along the length of the Appalachian Trail from Maine to Georgia using transceivers to exchange packet data between each site with the goal of sending the "golden packet" the entire length of the trail!

Robert Bruninga (WB4APR - Silent Key), the creator of the APRS protocol, founded the Appalachian Trail Golden Packet event. The intent is to get licensed amateur radio operators ("hams") to feel more comfortable with operating in the field, while demonstrating the ability to send real-time messages along 2200+ miles without the need for any infrastructure!

IN THE FIELD – ATGP 2026

Normally, ATGP verifies that all sites can hear the other sites, and then a “Golden Packet” is sent from Georgia to Maine.

In 2026, Net Central was used to establish a net via APRS and have all sites check into the net, send messages, interact with a priority object, and secure.

APRS resource type: Unknowns

Resources

Callsign	Name
AA1WI-8	AA1WI-8
BGFLTS-6	BGFLTS-6
CAMLBK-8	CAMLBK-8
EQUINOX-12	EQUINOX-1
GRYLCK-11	GRYLCK-11
HWKSB-5	HWKSB-5
KATHDN-15	KATHDN-1
KC1VMZ-6	KC1VMZ-6
KC1VMZ-7	KC1VMZ-7
KUWOHI-1	KUWOHI-1

Details	APRS Status
Name:	KATHDI
Description:	
Types:	UNKNC
Status:	UP
Symbol7:	
Location:	4554.34
Electrical Power:	UNKNC
Radio style:	UNKNC
Transmit power:	0W
Tracked?	false
Last heard:	2026-01-18 16:00:00

Weather on the east coast was not ideal

ATGP 2026 results:

- All except one site seen
- Some sites checked into net
- Some sites interacted with priority object

IN THE FIELD – ATGP 2026



Kenwood D710-GA w/SlimJim

- Digipeater for network
- B-TECH UV50-PRO w/Comet
- Secondary voice comms
- B-TECH UV-PRO HT w/BT
- Net Central link

50Ah Battery

Windows Laptop for Net Central

Thanks to the ATGP team!



INTERACTIVE DEMO

INTERACTIVE DEMO

- With your APRS messaging-enabled device, check into a net:
 - HAMX-1 send command “CI” for “check-in”
- Send a location beacon
- Answer the question (Q 1 answertext)
- When done, send command “CO” for “check-out”
- View Net Central Web UI from computer or phone browser

A series of white, overlapping geometric lines and polygons on a black background, located on the left side of the slide.

THANK YOU AND 73!

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