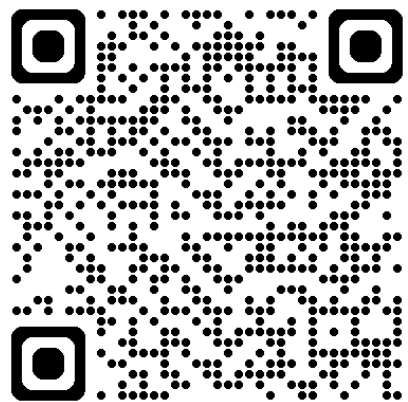




APRS, EMERGENCY COMMUNICATIONS AND NET CENTRAL

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

(UPDATED FOR
V2)

Create a net

Net callsign

NET001

Name

Description

Voice frequency

☒ Open APRS check-in

When unchecked, only expected or invited callsign roots may check in.

Expected callsigns

NOCALL N1ABC

Welcome message sent at check-in

APRS Symbol

Primary

Alternate

Symbol

Node (/n)

Net Location

Manual entry

Use map

Latitude

Longitude

Announce start and stop by bulletin

Yes

Remind participants to check out

Yes

Question reminder

No

Participant invite allowed

No

Communications

All eligible instances, including future ones

Additional net settings

- 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

Create a net

Net callsign

NET001

Name

Description

Voice frequency

☒ Open APRS check-in

When unchecked, only expected or invited callsign roots may check in.

Expected callsigns

NOCALL N1ABC

Welcome message sent at check-in

APRS Symbol

Primary

Alternate

Symbol

Node (/n)

Net Location

Manual entry

Use map

Latitude

Longitude

Announce start and stop by bulletin

Yes

Remind participants to check out

Yes

Question reminder

No

Participant invite allowed

No

Communications

All eligible instances, including future ones

Starting a net is simple:

- 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.

Create a net

Net callsign

NET001

Name

Description

Voice frequency

☒ Open APRS check-in

When unchecked, only expected or invited callsign roots may check in.

Expected callsigns

NOCALL N1ABC

Welcome message sent at check-in

APRS Symbol

Primary

Alternate

Symbol

Node (/n)

Net Location

Manual entry

Use map

Latitude

Longitude

Announce start and stop by bulletin

Yes

Remind participants to check out

Yes

Question reminder

No

Participant invite allowed

No

Communications

All eligible instances, including future ones

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:

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:

S status - report your status

STG - report status color of Green

STY - report status color of Yellow

STR - report status color of Red

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

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Communications
- Settings
- Help
- My account
- Logout

Pause updates

Net Details

Edit Secure

Selected net NEAPRS-1 — NE APRS Test Net

Callsign NEAPRS-1

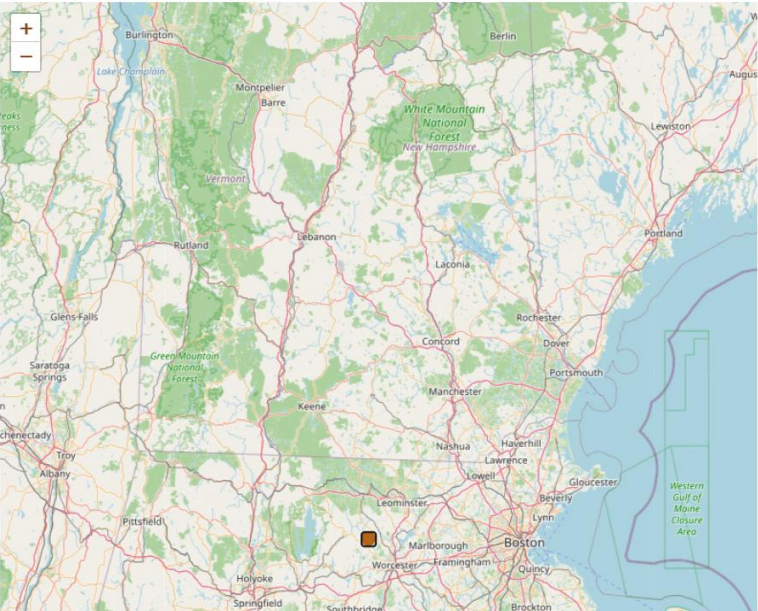
Name NE APRS Test Net

Description testing

Net Type Open

Active · Live

Participant map



Participants

Check in station Invite stations

Callsign	Status	Status color	Last heard	State
KC1VMZ-4 (author)	ready	Green	10/4/2026, 7:37:40 PM	Checked in

Participant details

Edit Status Edit Equipment Send Message Check out

Callsign KC1VMZ-4

Tactical Callsign author

Status ready

Status Color Green

Frequency

Checked In 10/4/2026, 7:35:54 PM

Last Heard 10/4/2026, 7:37:40 PM

Position Precision Reported position

Latitude Unknown

Longitude Unknown

Transmit Watts

Power

Backup Power

Radio

Messages

Send message

Live view shows the latest 200 entries.

Time	From	To	Message	Delivery
10/4/2026, 7:35:54 PM	KC1VMZ-4	Net	Checked in	RECORDED
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	Welcome to NEAPRS!	SENT
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	You checked into net NEAPRS-1 - send H for help	SENT
10/4/2026, 7:36:20 PM	NEAPRS-1	KC1VMZ-4	Tactical callsign updated	SENT
10/4/2026, 7:37:14 PM	KC1VMZ-4	Net	ready	RECORDED
10/4/2026, 7:37:14 PM	NEAPRS-1	KC1VMZ-4	Status updated	SENT
10/4/2026, 7:37:33 PM	NEAPRS-1	KC1VMZ-4	Q 1 everyone in place?	SENT

Questions

Ask question

Q 1: everyone in place?

answer

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.

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Communications
- Settings
- Help
- My account
- Logout

Pause updates

Net Details

Selected net NEAPRS-1 — NE APRS Test Net (archived)

Callsign

NEAPRS-1

Name

NE APRS Test Net

Description

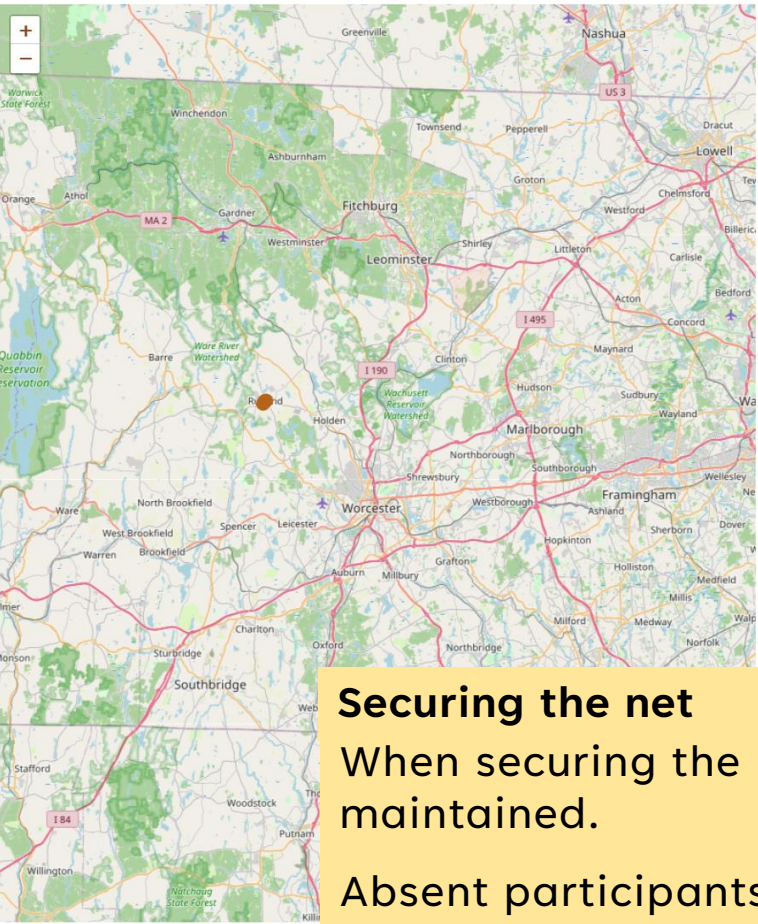
testing

Net Type

Open

Archived · Live

Participant map



Participants

Callsign	Status	Status color	Last heard	State
KC1VMZ-4 (author)	ready	Red	10/4/2026, 7:37:40 PM	Checked out

Participant details

Callsign

Tactical Callsign

Status

Status Color

Frequency

Checked In

Last Heard

Position Precision

Latitude

Longitude

Transmit Watts

Power

Backup Power

Radio

KC1VMZ-4

author

ready

Red

10/4/2026, 7:35:54 PM

10/4/2026, 7:37:40 PM

Reported position

Unknown

Unknown

Messages

Live view shows the latest 200 entries.

Time	From	To	Message	Delivery
10/4/2026, 7:35:54 PM	KC1VMZ-4	Net	Checked in	RECORDED
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	Welcome to NEAPRS!	SENT
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	You checked into net NEAPRS-1 - send H for help	SENT
10/4/2026, 7:36:20 PM	NEAPRS-1	KC1VMZ-4	Tactical callsign updated	SENT
10/4/2026, 7:37:14 PM	KC1VMZ-4	Net	ready	RECORDED
10/4/2026, 7:37:14 PM	NEAPRS-1	KC1VMZ-4	Status updated	SENT
10/4/2026, 7:37:33 PM	NEAPRS-1	KC1VMZ-4	Q 1 everyone in place?	SENT

Questions

Q 1: everyone in place?

Answers

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.

- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Communications
- Settings
- Help
- My account
- Logout

Pause updates

Net Details

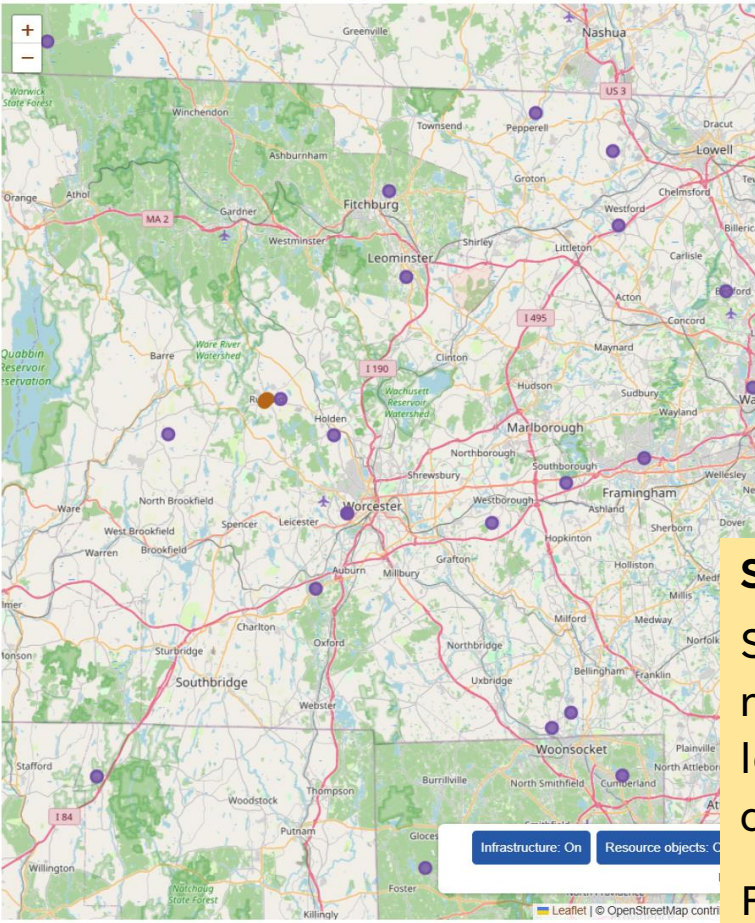
Edit Secure

Selected net NEAPRS-1 — NE APRS Test Net

Callsign NEAPRS-1
Name NE APRS Test Net
Description testing
Net Type Open

Active · Live

Participant map



Markers show checked-in stations with a recent position. Checkout removes a marker

Participants

Check in station Invite stations

Callsign	Status	Status color	Last heard	State
KC1VMZ-4 (author)	ready	Green	10/4/2026, 7:37:40 PM	Checked in

Participant details

Edit Status Edit Equipment Send Message Check out

Callsign KC1VMZ-4
Tactical Callsign author
Status ready
Status Color Green
Frequency
Checked In 10/4/2026, 7:35:54 PM
Last Heard 10/4/2026, 7:37:40 PM
Position Precision Reported position
Latitude Unknown
Longitude Unknown
Transmit Watts
Power

Messages

Send message

Live view shows the latest 200 entries.

Time	From	To	Message	Delivery
10/4/2026, 7:35:54 PM	KC1VMZ-4	Net	Checked in	RECORDED
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	Welcome to NEAPRS!	SENT
10/4/2026, 7:35:54 PM	NEAPRS-1	KC1VMZ-4	You checked into net NEAPRS-1 - send H for help	SENT
10/4/2026, 7:36:20 PM	NEAPRS-1	KC1VMZ-4	Tactical callsign updated	SENT
10/4/2026, 7:37:14 PM	KC1VMZ-4	Net	ready	RECORDED
10/4/2026, 7:37:14 PM	NEAPRS-1	KC1VMZ-4	Status updated	SENT
10/4/2026, 7:37:33 PM	NEAPRS-1	KC1VMZ-4	Q.1 everyone in place?	SENT

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.

Ask question

Record answer

Net Central

Home

Dashboard

Net Monitor

Archives

Explorer

Tools

Communications

Settings

Help

My account

Logout

Pause updates

APRS Explorer

Information about APRS stations, infrastructure and objects.

Resource type

Stations

Find

Callsign, name or status

Create object

Resource map

Resources (214)

AB1ZU-10	STATION	AB1ZU-10 Radio DREWSON'S ON THE FINE SIDE	Oct 4, 2026, 07:21:10 PM EDT
AB2NE	STATION	https://www.ka2ddo.org/ka2ddo/YAAC.html	Oct 4, 2026, 07:13:01 PM EDT
AE1P	STATION	"5y)222.900MHz D-STAR 73 from NSwanzey NH	Oct 4, 2026, 07:09:31 PM EDT
AJ1L	DIGIPEATER, STATION, WEATHER	Rockland, MA Fill in Digi & WX	Oct 4, 2026, 07:22:27 PM EDT
AJ1Z-10	STATION	read-write iGate Reading MA	Oct 4, 2026, 05:33:20 PM EDT
AJ7LB-10	STATION		Oct 4, 2026, 07:28:38 PM EDT
AK1P-9	STATION	263/000/A=000000Paul - AK1P	Oct 4, 2026, 06:55:16 PM EDT
ALAMOS	DIGIPEATER, STATION, WEATHER	=L>;7E2Y">_!G.../...g...t094h23b.....LoRa APRS Digi TRES ALAMOS 433.775MHz BW125 SF7 CR4:6 de N7AIL Batt=4.23V Ext=21.90V	Oct 4, 2026, 07:25:45 PM EDT

AJ1L

Callsign

Oct 4, 2026, 07:22:27 PM EDT

Stale

No

Status

Rockland, MA Fill in Digi & WX

Symbol

Weather station (/_)

Types

DIGIPEATER, STATION, WEATHER

Comment

@041922z4205.64N/07054.25W_090/000g001t058r000p001P001h91b10203 Rockland, MA WX & Digi

Ignored

No

Tracked Station?

No

Location

-70.90416666666667, 42.094

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.

21

APRS Explorer

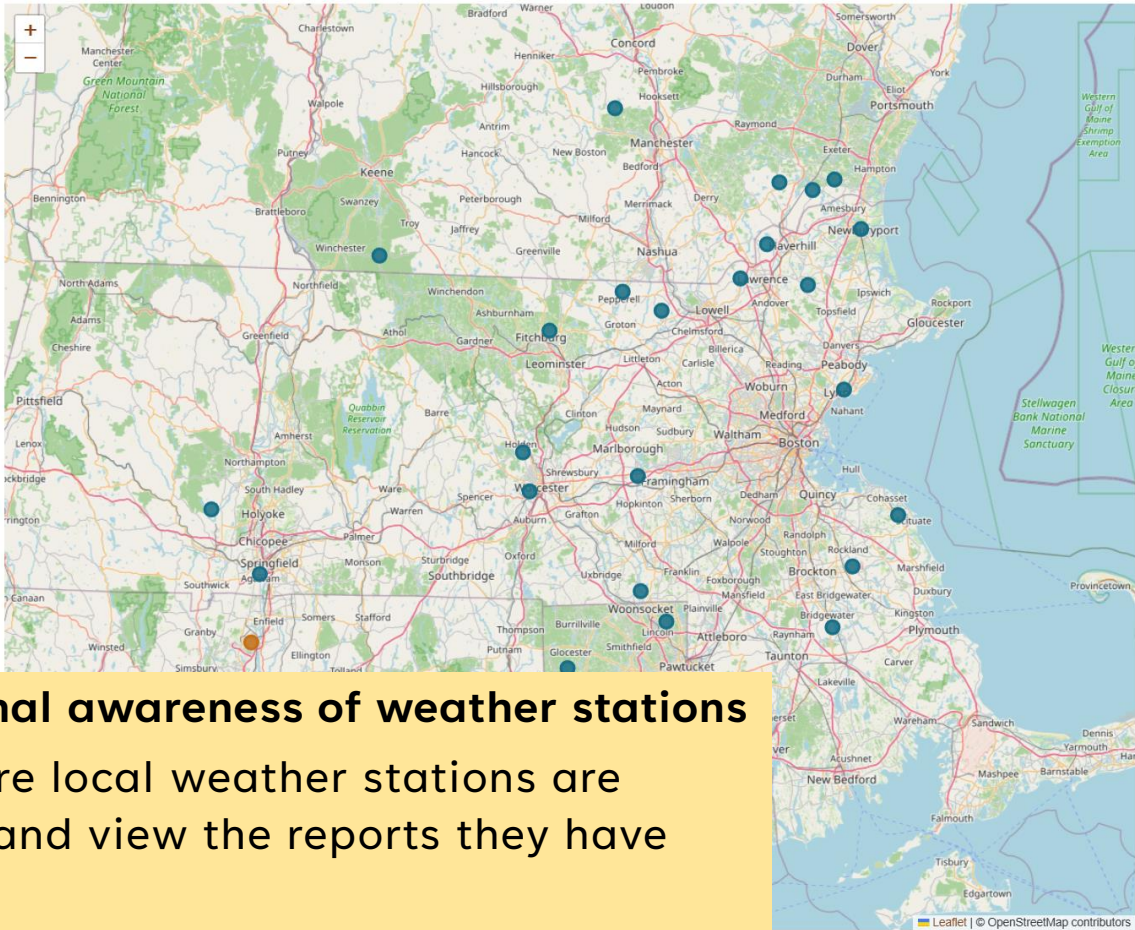
Information about APRS stations, infrastructure and objects.

Resource typeWeather stations

FindCallsign, name or status

Create object

Resource map



Situational awareness of weather stations

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

Live

Resources (32)

Callsign/name	Type	Status	Last heard
A1JL	DIGIPEATER, STATION, WEATHER	Rockland, MA Fill in Digi & WX	Oct 4, 2026, 07:22:27 PM EDT
ALAMOS	DIGIPEATER, STATION, WEATHER	=L>;7E2Y">_!G.../...g...t094h23b.....LoRa APRS Digi TRES ALAMOS 433.775MHz BW125 SF7 CR4:6 de N7AIL Batt=4.23V Ext=21.90V	Oct 4, 2026, 07:25:45 PM EDT
K1AWR	STATION, WEATHER	@042329z4155.84N/07238.47W_333/001g001t055r000p000P000h88b10200L000AmbientCWOP.com	Oct 4, 2026, 07:29:38 PM EDT
K1QL	STATION, WEATHER	@042327z4202.51N/07130.92W_052/001g002t058r000p000P000h85b10203L000AmbientCWOP.com	Oct 4, 2026, 07:27:35 PM EDT
K1TTC	STATION, WEATHER	@042324z4242.55N/07113.61W_036/000g000t058r000p000P000b10227h66L000eMB64	Oct 4, 2026, 07:24:32 PM EDT
KA1GIU-3	DIGIPEATER, IGATE, STATION, WEATHER	@042322z4255.06N/07057.33W_026/000g003t054r000p000P000h00b000000WX3in1 weather	Oct 4, 2026, 07:22:49 PM EDT
KA1STV	STATION, WEATHER	@042327z4212.93N/07245.39W_001/000g001t053r000p000P000h96b10195L000AmbientCWOP.com	Oct 4, 2026, 07:27:35 PM EDT

K1AWR

Callsign	K1AWR
Last Heard	Oct 4, 2026, 07:29:38 PM EDT
Stale	No
Comment	@042329z4155.84N/07238.47W_333/001g001t055r000p000P000h88b10200L000AmbientCWOP.com
Symbol	Weather station (/)
Types	STATION, WEATHER
Ignored	No
Tracked Station?	No
Location	-72.64116666666666, 41.93066666666667

- View details
- Start tracking
- Ignore

APRS Explorer

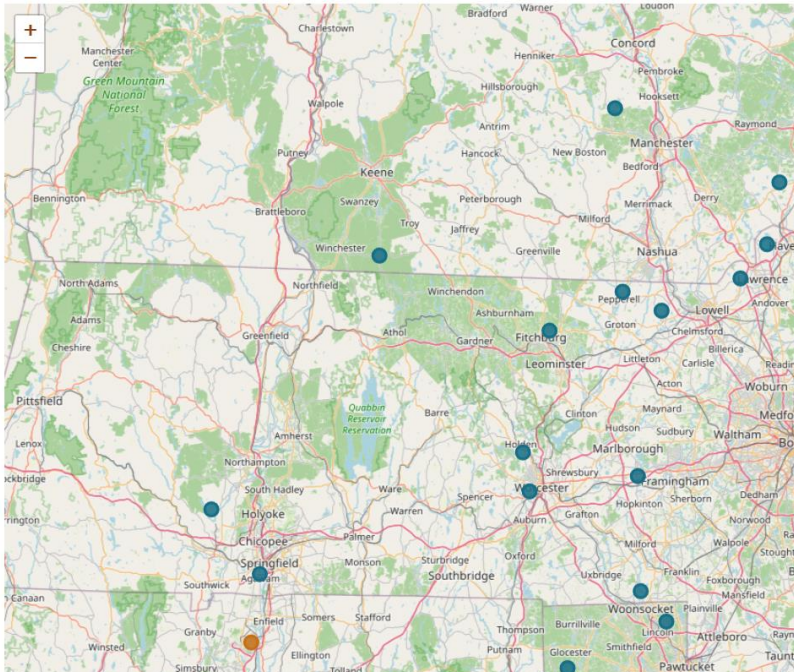
Information about APRS stations, infrastructure and objects.

Resource typeWeather stations

FindCallsign, name or status

Create object

Resource map



Situational awareness of weather stations

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

K1AWR

General Information

Callsign	K1AWR
Last Heard	Oct 4, 2026, 07:29:38 PM EDT
Software	APRS
Stale	No
Comment	@042329z4155.84N/07238.47W_333/001g001t055r000p000P000h88b10200L000Ambien tCWOP.com
Position Ambiguity	0
Approximate	No
Uncertainty Meters	0
Raw Latitude	4155.84N
Raw Longitude	07238.47W
Position Time	2026-10-04T23:29:38.296011700Z
Symbol	/_
Types	STATION, WEATHER
Symbol Description	Weather station
Location	-72.64116666666666, 41.93066666666667
Ignored	No

Current Weather

Temperature

55 °F

Oct 4, 2026, 07:29:38 PM EDT

Atmosphere

Humidity: 88 %
Pressure: 1020.0 mb
Wind: 1 MPH 333 degrees
Gust: 1 MPH

Precipitation

Last hour: 0 inches/100
Last day: 0 inches/100
Since 00:00: 0 inches/100
Snow: 0 inches/100

Previous weather reports

IdTime (local time)	Temperature (°F)	Humidity (%)	Barometric pressure (hPa)	Wind speed (mph)	Wind direction (°)
Oct 4, 2026, 07:24:37 PM EDT	56	87	1019.8	2	208
Oct 4, 2026, 07:19:36 PM EDT	57	85	1020.4	0	282
Oct 4, 2026, 07:14:34 PM EDT	57	84	1020.6	0	282

Leaflet | OpenStreetMap contributors

	Last heard
A Fill in Digi & WX	Oct 4, 2026, 07:22:27 PM EDT
!G.../...g...t094h23b.....LoRa APRS Digi TRES ALAMOS 433.775MHz BW125 N7AIL Batt=4.23V Ext=21.90V	Oct 4, 2026, 07:25:45 PM EDT
55.84N/07238.47W_333/001g001t055r000p000P000h88b10200L000Ambie	Oct 4, 2026, 07:29:38 PM EDT
02.51N/07130.92W_052/001g002t058r000p000P000h85b10203L000Ambie	Oct 4, 2026, 07:27:35 PM EDT
42.55N/07113.61W_036/000g000t058r000p000P000b10227h66L000eMB64	Oct 4, 2026, 07:24:32 PM EDT
55.06N/07057.33W_026/000g003t054r000p000P000h00b000000WX3in1	Oct 4, 2026, 07:22:49 PM EDT
12.93N/07245.39W_001/000g001t053r000p000P000h96b10195L000Ambie	Oct 4, 2026, 07:27:35 PM EDT

VR

, 2026, 07:29:38 PM EDT

329z4155.84N/07238.47W_333/001g001t055r000p000P000h88b10200L000AmbientCWOP.com
her station (/_)
ON, WEATHER

411666666666, 41.93066666666667

Net Central

Home

Dashboard

Net Monitor

Archives

Explorer

Tools

Communications

Settings

Help

My account

Logout

Pause updates

APRS Explorer

Information about APRS stations, infrastructure and objects.

Resource type

All resources

Find

Callsign, name or status

Create object

Resource map

Situational awareness of APRS objects

See what objects have been reported and add your own!

Resources (256)

Callsign/name	Type	Status	Last heard
147.24+AZ	OBJECT	PHG5670T162.2 Az Rprr Assoc: www.w7ara.org	Oct 4, 2026, 06:00:17 PM EDT
147.345CT	OBJECT	147.345MHz T1514 R50m 442.6&224.36	Oct 4, 2026, 06:01:15 PM EDT
AA1HD B	OBJECT, REPEATER	/A=000984RNG0025 440 Voice 442.15000MHz +5.0000MHz	Oct 4, 2026, 05:57:16 PM EDT
AA1HD C	OBJECT, REPEATER	/A=002624RNG0050 2m Voice 145.26000MHz -0.6000MHz	Oct 4, 2026, 05:56:56 PM EDT
AA2T-10	DIGIPEATER, STATION	Fill-in Digipeater/IGate Leominster, MA	Oct 4, 2026, 05:21:33 PM EDT
ΔR1PH-10	OBJECT,	145.090MHz Winlink Packet Gateway	Oct 4, 2026,

N1ABC-10

Alive

Comment

Callsign

Last Heard

Types

Symbol

Tracked Station?

Ignored

Location

Yes

145.090MHz Winlink Packet Gateway

N1ABC-10

Oct 4, 2026, 05:21:51 PM EDT

OBJECT, WINLINK GATEWAY

WinLink (overlay W) (Wa)

No

No

-71.5416666666667, 42.3583333333333

View details

24

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)

Classification

Automatically classify stations heard based on these rules.

COMMENT CONTAINS (D-STAR) → D

STATUS CONTAINS (D-STAR) → DSTA

STATUS CONTAINS APRS IGATE → IG

STATUS CONTAINS APRS_IGATE → IG

STATUS CONTAINS APRSISCE → STAT

COMMENT CONTAINS BBS → BBS

STATUS CONTAINS BBS → BBS

STATUS CONTAINS BI-DIRECTIONAL-I-GATE → IGATE

COMMENT CONTAINS DIGI → DIGIPEATER

STATUS CONTAINS DIGI → DIGIPEATER

Add classification rule

Remove rule

Remove rule

Remove rule

Remove rule

Remove rule

Remove rule

Remove rule

Remove rule

Remove rule

Add classification rule

Match field

CALLSIGN

Match type

CONTAINS

Value

Station type

STATION

Cancel

Review rule

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

26

APRS Explorer

Information about APRS stations, infrastructure and objects.

Resource type Callsigns Find Callsign, name or status Create object

Resource map

No map available.

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.

Resources (178)

Callsign	Name	Country	State	License	Last heard
AA2T	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:21:33 PM EDT
AB1ZU	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:21:10 PM EDT
AB2NE	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:13:01 PM EDT
AE1P	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:09:31 PM EDT
AJ1L	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:22:27 PM EDT
AJ1Z	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 05:33:20 PM EDT
AJ7LB	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:28:38 PM EDT
AK1P	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 06:55:16 PM EDT
ALAMOS	Unknown	Unknown	Unknown	Unknown	Oct 4, 2026, 07:25:45 PM EDT

AB2NE

Callsign	AB2NE
Name	Unknown
Country	Unknown
State	Unknown
License	Unknown
Last Heard	Oct 4, 2026, 07:13:01 PM EDT
Tracked Station?	No
Ignored	No

Identify Start tracking Ignore

APRS Explorer

Information about APRS stations, infrastructure and objects.

Resource type

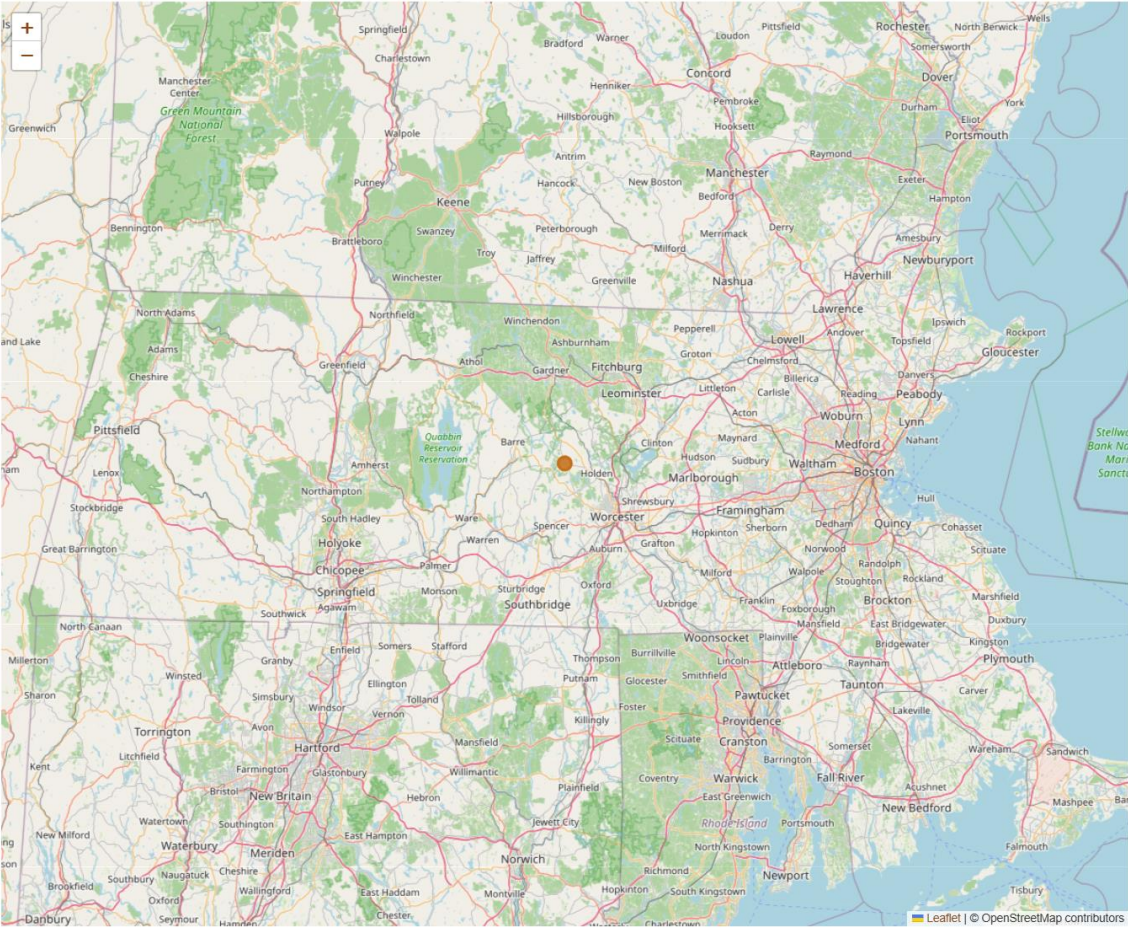
Emergency operations centers

Find

Callsign, name or status

Create object

Resource map



1 current locations. Updates preserve your map position.

Resources (1)

Callsign/name	Type	Status	Last heard
RUTEOC-1	EOC, OBJECT	Regional Dispatch	Unknown

RUTEOC-1

Callsign	RUTEOC-1
Type	EOC
Comment	Regional Dispatch
Alive	Yes
Types	OBJECT
Symbol	Emergency operations center (/o)
Last Heard	Unknown
Tracked Station?	No
Ignored	No
Location	-71.954223, 42.377049

View details

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 “R” 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: R
```

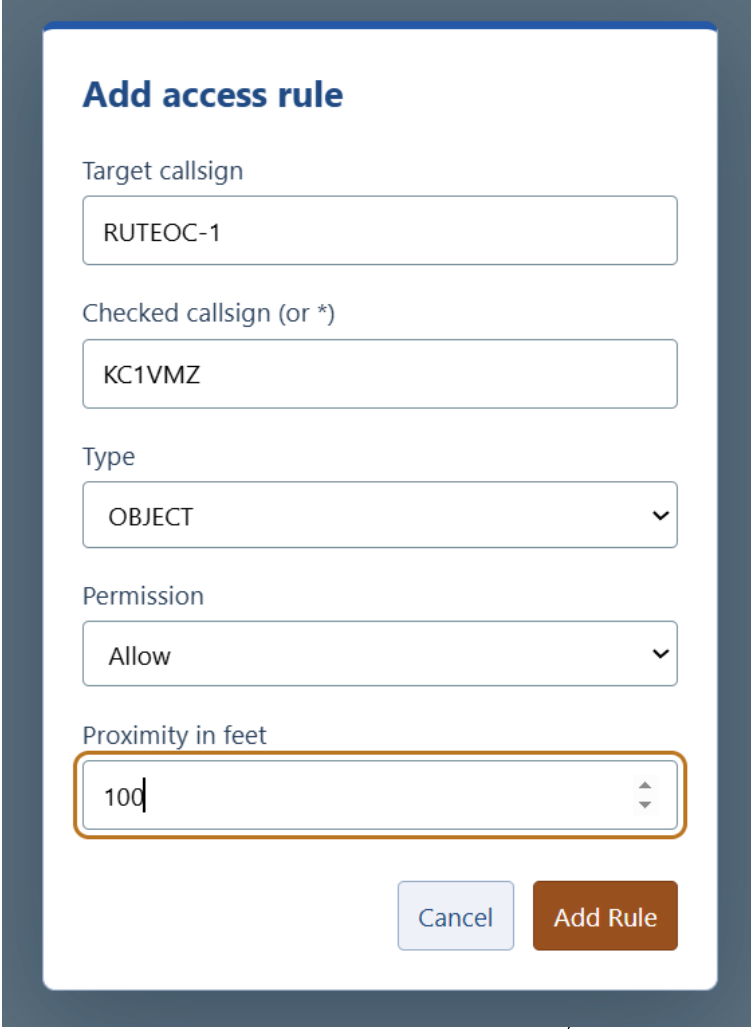
```
2025-10-21 20:07:34 EDT: TESTRF-4>KC1VMZ-15: Contacts: John R:KC1VMZ:20251021
```

```
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



The screenshot shows a dialog box titled "Add access rule" with a blue header. It contains several input fields and dropdown menus. The "Target callsign" field has "RUTEOC-1" entered. The "Checked callsign (or *)" field has "KC1VMZ" entered. The "Type" dropdown menu is set to "OBJECT". The "Permission" dropdown menu is set to "Allow". The "Proximity in feet" field has "100" entered and is highlighted with an orange border. At the bottom right, there are two buttons: "Cancel" (light blue) and "Add Rule" (brown).

Add access rule

Target callsign
RUTEOC-1

Checked callsign (or *)
KC1VMZ

Type
OBJECT

Permission
Allow

Proximity in feet
100

Cancel Add Rule

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

Create object

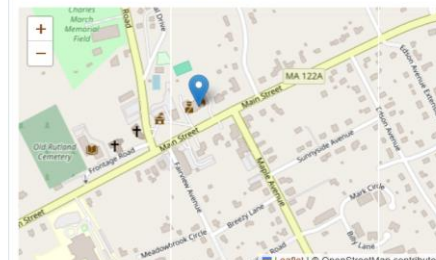
Callsign
RUTEOC-1

Type
Net Central EOC Object

Object Location

Manual entry Use map

Click the map to select the object location. The marker can be dragged.
Latitude: 42.377049 · Longitude: -71.954223



Comment
Regional Dispatch

APRS Symbol

Primary Alternate

Symbol
Emergency Operations Center (/o)

☒ Active (send periodic beacons)

Communications
All eligible instances, including future ones

Create Cancel

INTERACTIVE “PRIORITY OBJECTS”

EOCs

Mobilization information

- Incident name
- Status (Normal, Partial Full)

Contact information

- Director name
- Incident commander name

Object Details

EditWithdraw object

Callsign	RUTEOC-1
Location	-71.954223, 42.377049
Status	Active
Symbol	Emergency operations center (/o)
Comment	Regional Dispatch

Contact information

Update

Director Name	John Smith
Incident Commander Name	Joe Underling
Reported	10/4/2026, 7:01:20 PM

Mobilization information

Update

Eoc Name	Rutland Fire (test)
Status	Normal
Level	1
Reported	10/4/2026, 7:01:36 PM

Contact information history

Reported	Director Name	Incident Commander Name
10/4/2026, 7:01:20 PM	John Smith	Joe Underling

Mobilization information history

Reported	Eoc Name	Status	Level
10/4/2026, 7:01:36 PM	Rutland Fire (test)	Normal	1

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

Object Details

EditWithdraw object

Callsign	RUTSHL-2
Location	-71.957105, 42.373923
Status	Active
Symbol	Shelter (v)
Comment	Shelter site

Status information

Latest reportUpdate

Status	Stand-by
State	Closed
Message	Test - closed for night
Reported	10/4/2026, 7:03:47 PM

Population census

Latest reportUpdate

Ages 0–3	5
Ages 4–7	10
Ages 8–12	15
Ages 13–18	10
Ages 19–65	30
Ages 66+	25
Reported	10/4/2026, 7:04:16 PM

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

Worker census

Shift 1

Shift	Shift 1
Health Services	1
Mental Health	1
Spiritual Care	1
Caseworkers	3
Feeding	10
Other	2
Reported	10/4/2026, 7:05:10 PM

Update

Shift 2

No information reported yet.

Update

Shift 3

No information reported yet.

Update

Food availability and needs

On hand

Report Category	On hand
Breakfast	100
Lunch	100
Dinner	100
Snack	100
Date	2026-10-04
Reported	10/4/2026, 7:05:30 PM

Update

Needed

No information reported yet.

Update

Used

No information reported yet.

Update

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.

The screenshot shows a web interface for managing an object. It has a light blue header with the title 'Object Details' and two buttons: 'Edit' and 'Withdraw object'. Below the header is a table with object metadata. The 'Resource values' section contains three rows with 'Add' and 'Remove' buttons. The 'Object Security' section has a link to 'Manage object security in Settings' and a message stating 'No object security rules for this station.'

Object Details	
Callsign	DUNKS-1
Location	-71.955824, 42.375732
Status	Active
Symbol	Restaurant (\R)
Comment	Dunks

Resource values	
Baguettes: No	<button>Add</button> <button>Remove</button>
Coffee: Yes	<button>Remove</button>
Donuts: Yes	<button>Remove</button>

Object Security
[Manage object security in Settings](#)
No object security rules for this station.

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

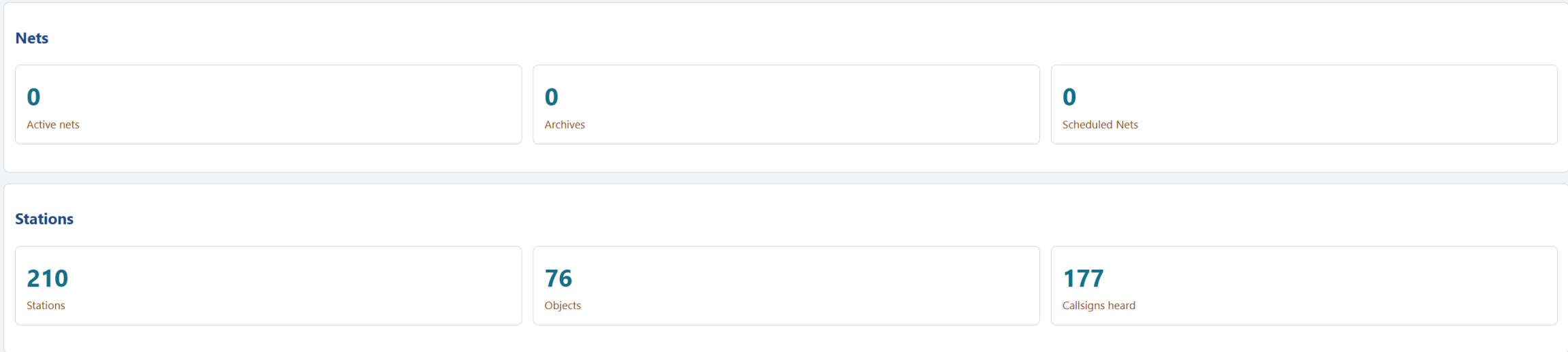
Key – Net Central will send the value back to the client

R – Net Central will send back all key/value pairs

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

Dashboard

Statistics for Net Central and monitored APRS sources.



Dashboard to quickly view activity

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

Tools

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

[Winlink](#) [NTS](#) [Packet logging](#)

NTS Radiogram

Number	Precedence	HX	Station of origin	Place of origin	Check	Time filed	Date filed

To	
Street address	
City, State	
Phone number	
Email address	

Message

Enter one word per message field, up to 25. Check must equal the number of words.

Word 1	Word 2	Word 3	Word 4	Word 5
Word 6	Word 7	Word 8	Word 9	Word 10
Word 11	Word 12	Word 13	Word 14	Word 15
Word 16	Word 17	Word 18	Word 19	Word 20
Word 21	Word 22	Word 23	Word 24	Word 25

Signature	
-----------	----------------------

Operator note	
---------------	----------------------

Send radiogram

Additional Tools

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

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.

Tools

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

[Winlink](#) [NTS](#) [Packet logging](#)

Send a simple email message through Winlink via APRS .

Winlink

Callsign

Winlink password

Recipient

Subject

Message

Send via Winlink

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
```

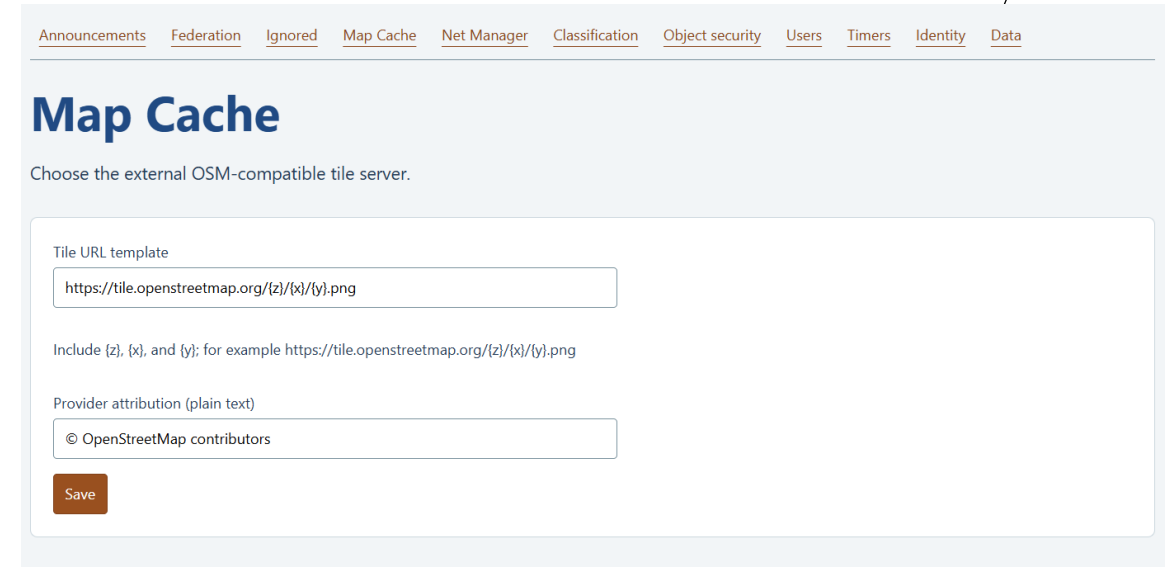
```
2025-10-24 19:49:54 EDT: KC1VMZ>WLNK-1: Net Central login request from KC1VMZ
2025-10-24 19:49:54 EDT: WLNK-1>KC1VMZ: Login [514]:
2025-10-24 19:51:20 EDT: KC1VMZ>WLNK-1: hbMHed
2025-10-24 19:51:20 EDT: WLNK-1>KC1VMZ: Hello KC1VMZ. Login valid for ~2 hours
2025-10-24 19:52:27 EDT: KC1VMZ>WLNK-1: 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.



The screenshot shows the 'Map Cache' configuration page in Net Central. At the top, there is a navigation bar with links: [Announcements](#), [Federation](#), [Ignored](#), [Map Cache](#), [Net Manager](#), [Classification](#), [Object security](#), [Users](#), [Timers](#), [Identity](#), and [Data](#). Below the navigation bar, the page title 'Map Cache' is displayed in a large blue font. Underneath the title, a subtitle reads 'Choose the external OSM-compatible tile server.' The main content area contains three input fields: 'Tile URL template' with the value 'https://tile.openstreetmap.org/{z}/{x}/{y}.png', 'Include {z}, {x}, and {y}; for example https://tile.openstreetmap.org/{z}/{x}/{y}.png', and 'Provider attribution (plain text)' with the value '© OpenStreetMap contributors'. A 'Save' button is located at the bottom left of the form.

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.

Settings

[Announcements](#) [Federation](#) [Ignored](#) [Map Cache](#) [Net Manager](#) [Classification](#) [Object security](#) [Users](#) [Timers](#) [Identity](#) [Data](#)

Net Manager

Manage remote Net Central manageability.

Net Manager Enabled
Yes

Net Manager Callsign
NETMGR-11

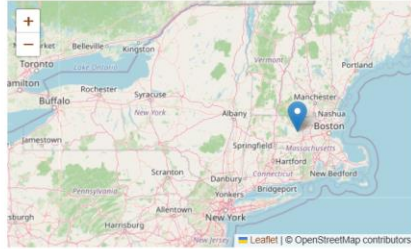
Net Manager Owner
jcrokicki@gmail.com

Communications
All eligible instances, including future ones

Net Manager Location

Manual entry Use map

Click the map to select a location, or drag the marker.
Latitude: 42.374044 · Longitude: -71.956021



Save

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

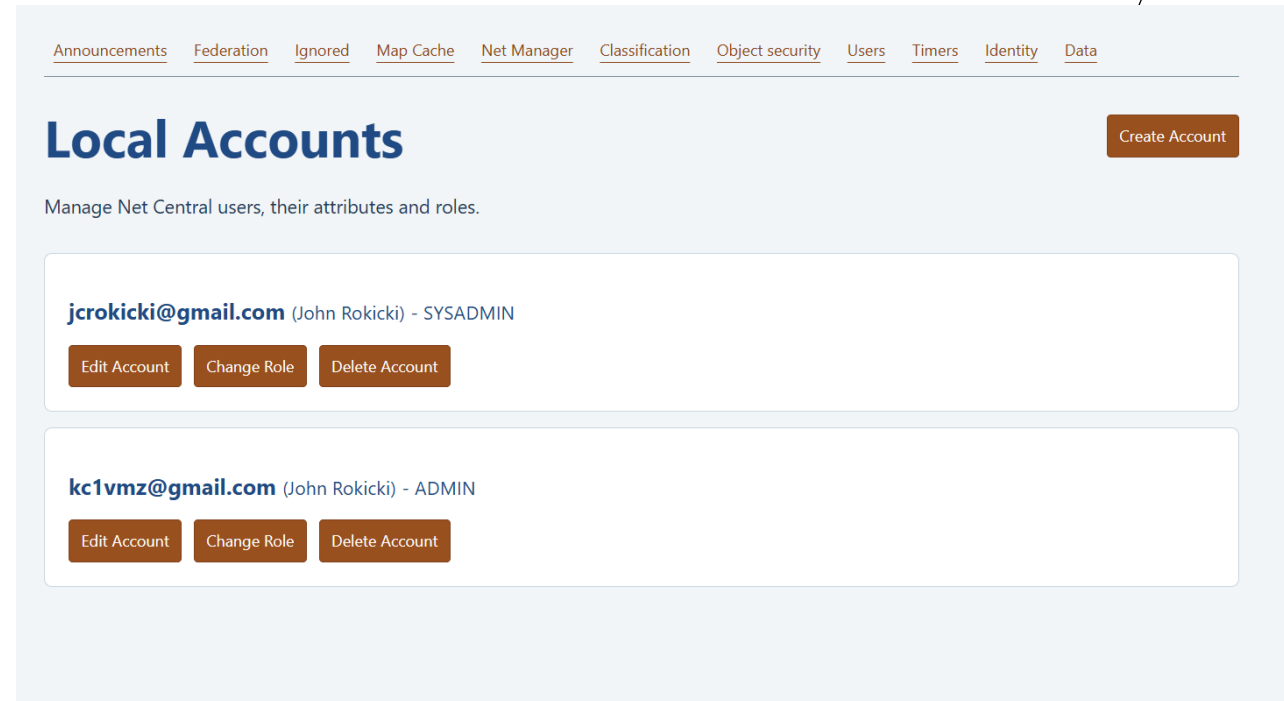
- View information

Administrator

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

System administrator

- Reset data



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

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.

[Winlink](#)

[NTS](#)

[Packet logging](#)

Packet logging

Packet logging enabled

No



Save

Packets are retained according to the packet retention and limit configured in Settings / Timers.

[Download raw packets](#)

The download includes up to 1,000 retained packets, oldest first.

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
- ?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
- ?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
- ?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

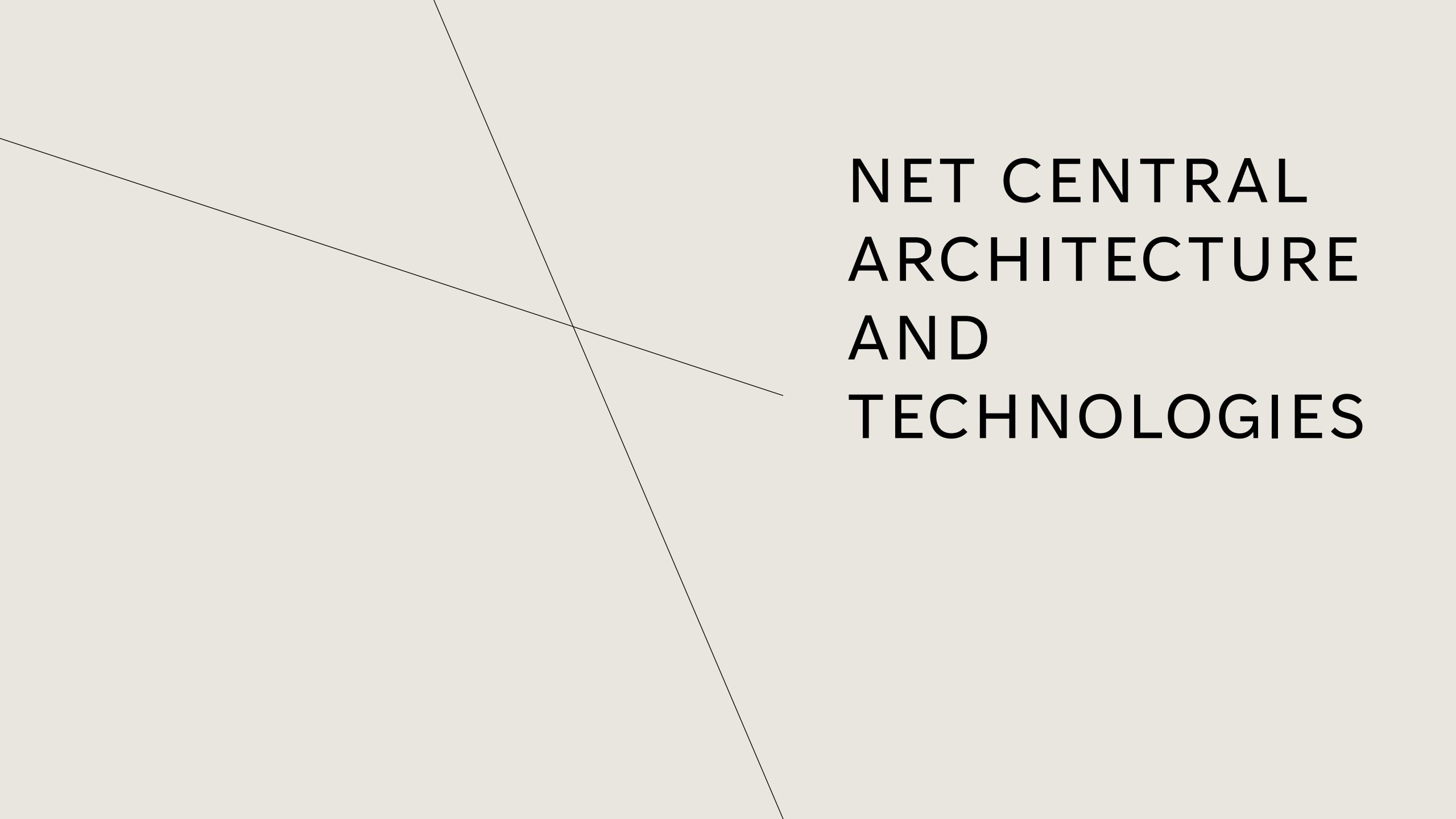
- ?INFO - returns name, comment and supported directed query commands
- ?CMD - returns list of valid directed query commands
- ?APRSO - returns object information
- ?APRSP - returns object position
- ?NCGRI - returns name, comment
- ?NCGRV - returns token=value pairs stored for object

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?

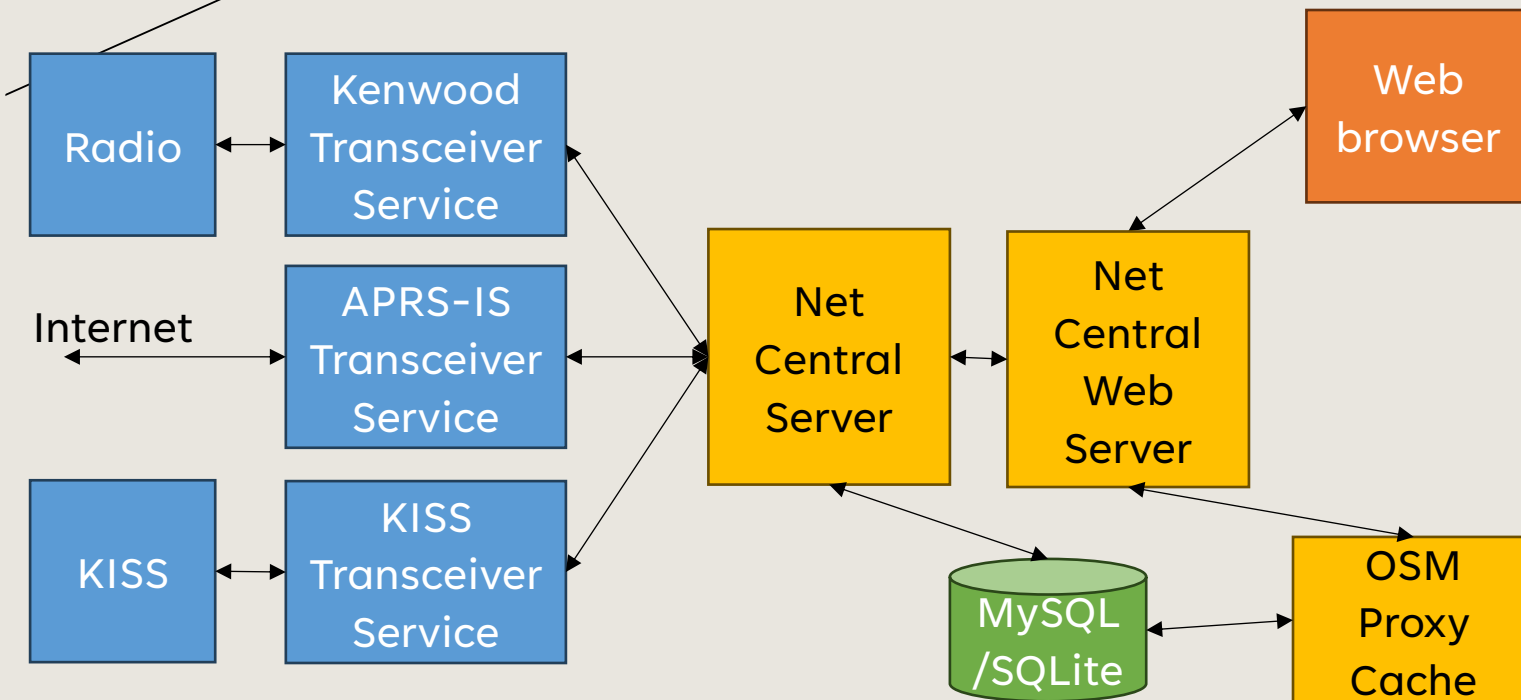
SIDE DREAMS

- 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 V1 ARCHITECTURE



Modern architecture

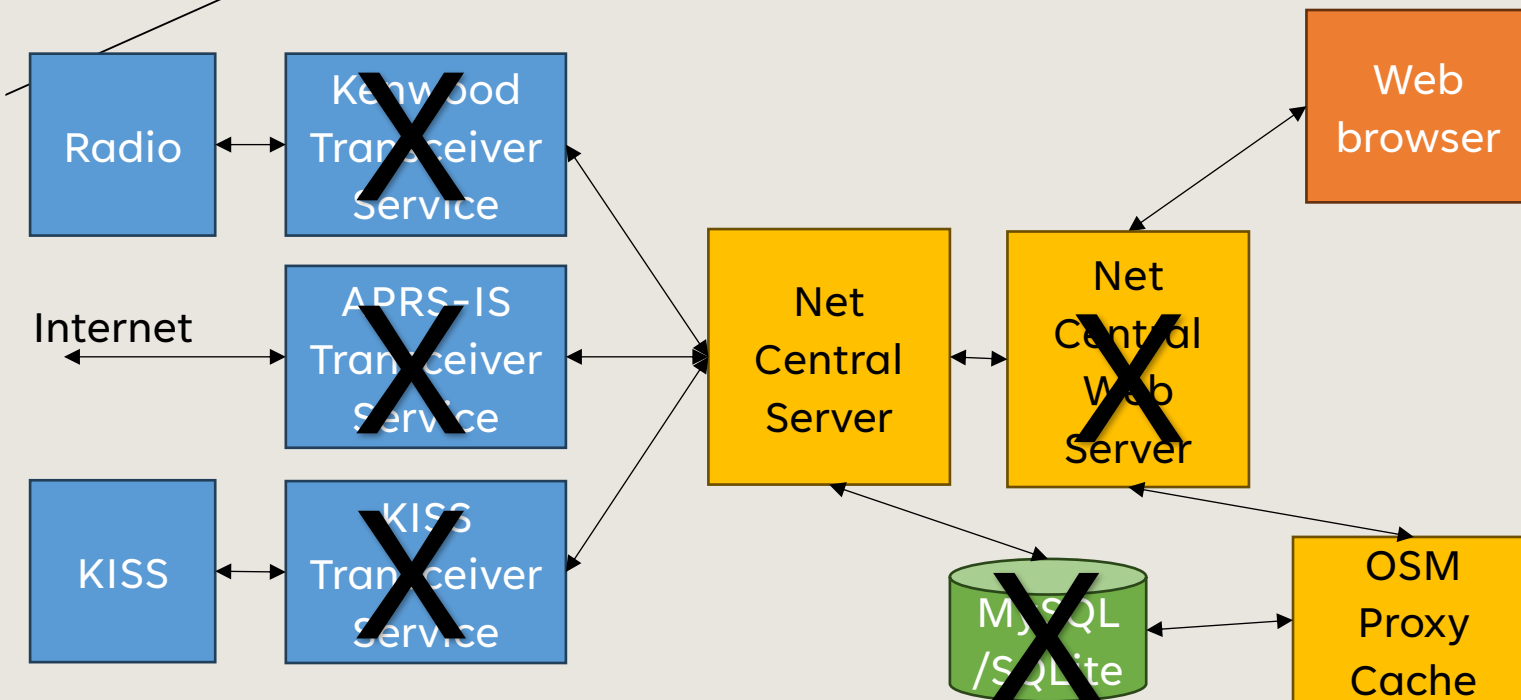
Net Central is a REST-based microservice architecture.

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 V1 ARCHITECTURE



Modern architecture

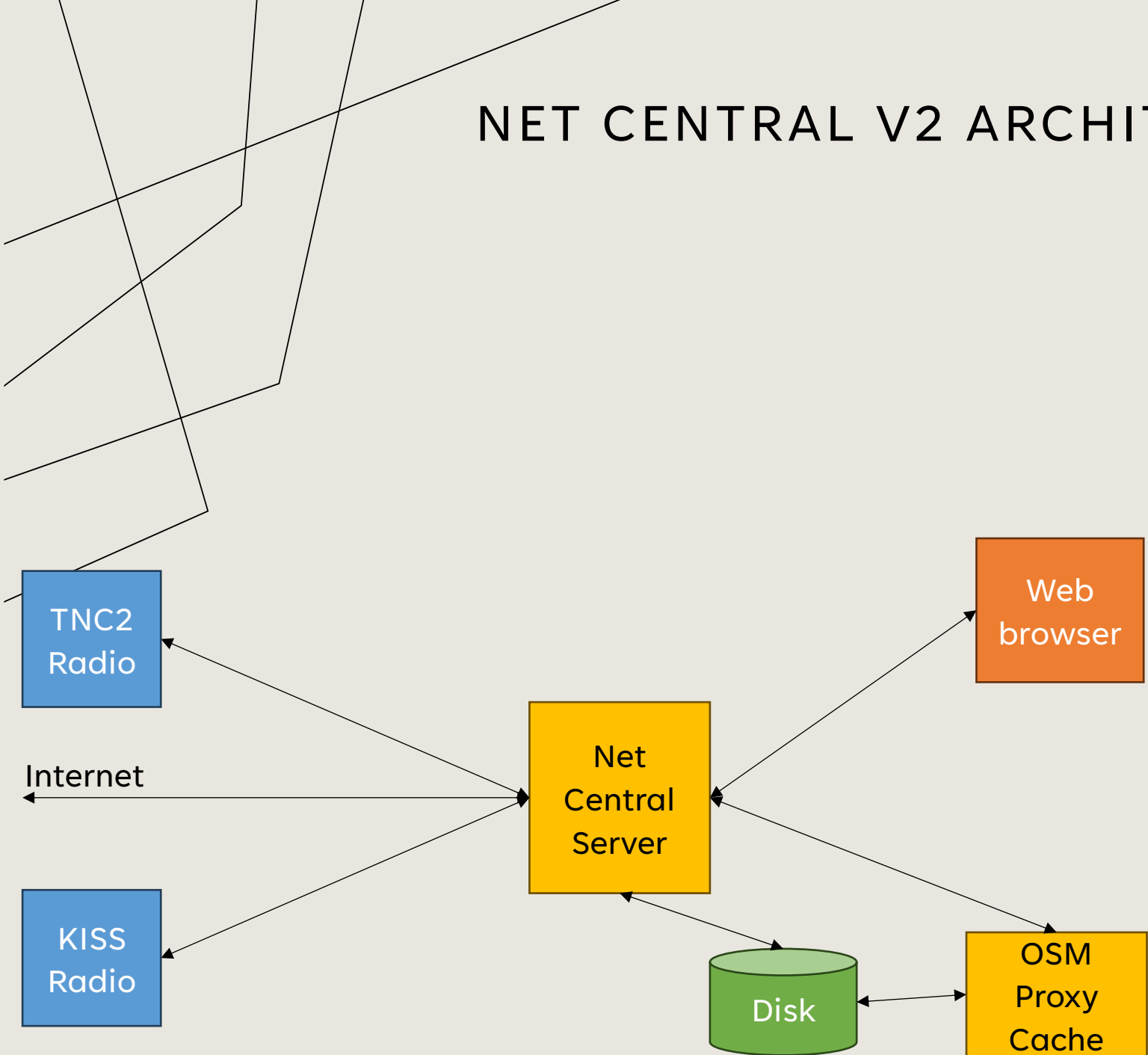
Net Central is a REST-based microservice architecture.

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 V2 ARCHITECTURE



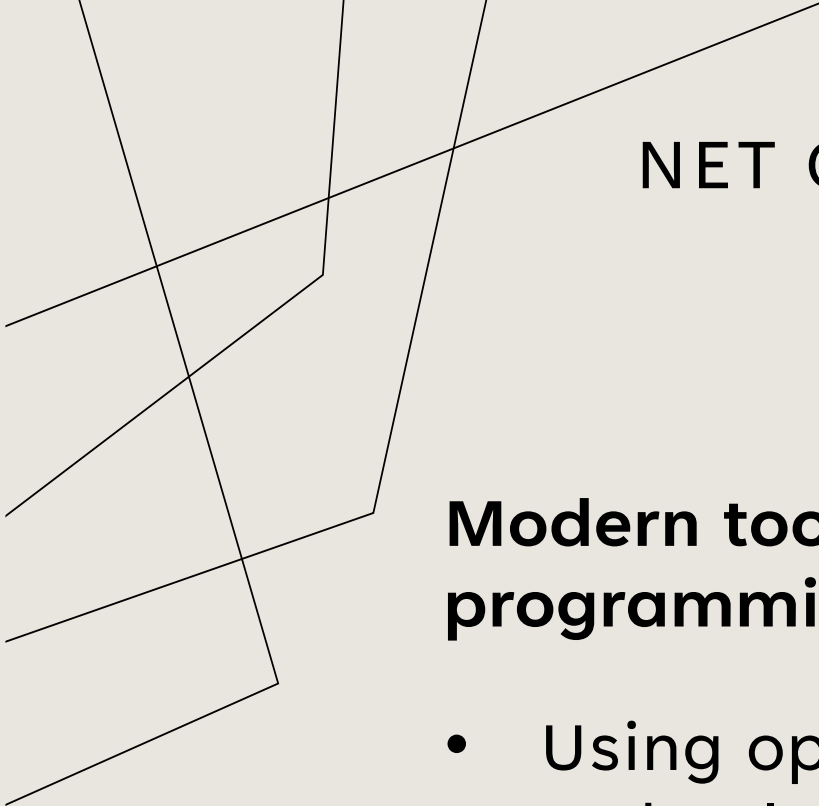
Modern architecture

Net Central is a REST-based microservice architecture.

Radio connectivity is embedded in the server.

Can have more than one of each type.

OSM Proxy Cache is optional and writes to the local file system.



NET CENTRAL V2 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 21
- Spring
- Thymeleaf
- 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.

IN THE FIELD – ATGP 2026

Net Central

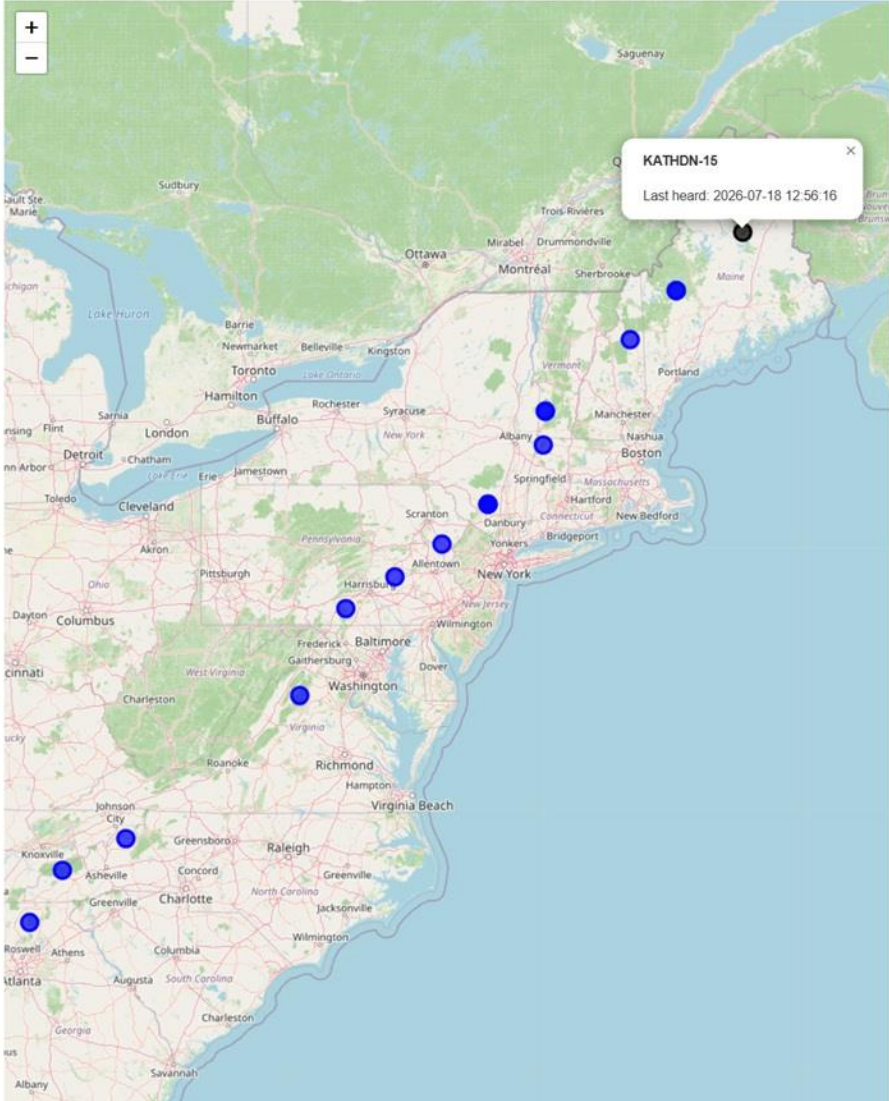
- Home
- Dashboard
- Net Monitor
- Archives
- Explorer
- Tools
- Setup
- Logout

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

Version
v1.0.26

Information about the station's infrastructure and objects

APRS resource type: Unknowns



KATHDN-15
Last heard: 2026-07-18 12:56:16

Resources

Callsign	Name
AA1WI-8	AA1WI-8
BGFLTS-6	BGFLTS-6
CAMLBK-8	CAMLBK-8
EQUINOX-12	EQUINOX-12
GRYLCK-11	GRYLCK-11
HWKSBL-5	HWKSBL-5
KATHDN-15	KATHDN-15
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: 2026-07-18 12:56:16

ATGP 2026 challenges:

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!

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!

John Rokicki

KC1VMZ

www.kc1vmz.com

kc1vmz@gmail.com

netcentral.groups.io

