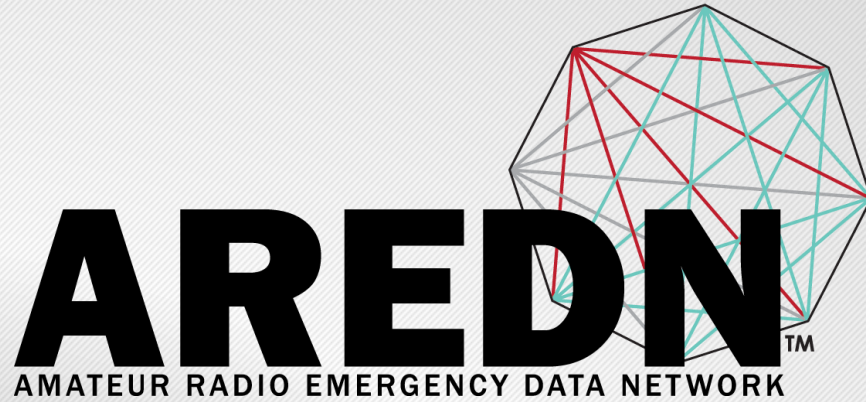






**AREION™**  
AMATEUR RADIO EMERGENCY DATA NETWORK



# Ham Radio For a New Generation

Andre, Hansen, K6AH

Hamvention 2019

Greene County Fairgrounds, Xenia, OH

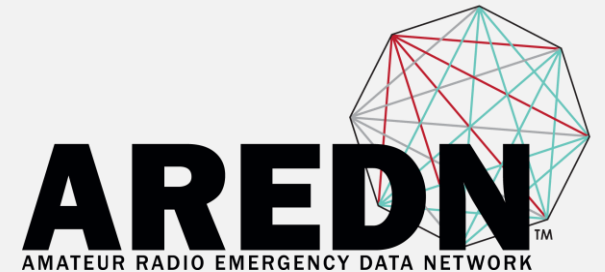
May 17 - 19, 2019

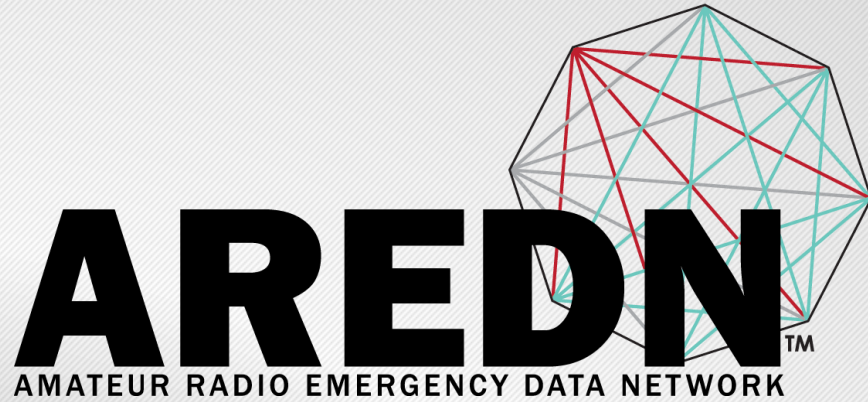
AT THE CENTER OF EMERGENCY PREPAREDNESS



- Appealing to younger hams
- IBM's Call For Code
- New Development
  - New Features
  - Updated Documentation
  - Support for More Devices/Manufacturers
- User Applications
- Network Growth

## Presentation Overview





# Appealing to Younger Hams

A white-haired, retiree, with 50 years of ham radio experience is about to tell you this can appeal to younger hams.

...the irony is not lost on me.

# Appealing to Younger Hams



## Linux Opensource Developers Conference

... a new interest area for OpenSource Developers



### Joe Ayers



Presentation: [AREDN: The technology and considerations to build adhoc wireless networks](#)

Developer  
AREDN Inc.

Professionally Joe has worked in Product Development for over 30 years starting out at Texas Instruments in the 1980s and now works for Schnieder Electric in the Industrial Automation R&D group creating control systems to automate Industrial facilities including Oil Refineries, Nuclear, and Coal Power Plants.

Joe began his Open Source contributions bringing mesh wireless networking to to the Amateur Radio community. In 2013, he established the first wireless hub site in Orange...

### Orv Beach

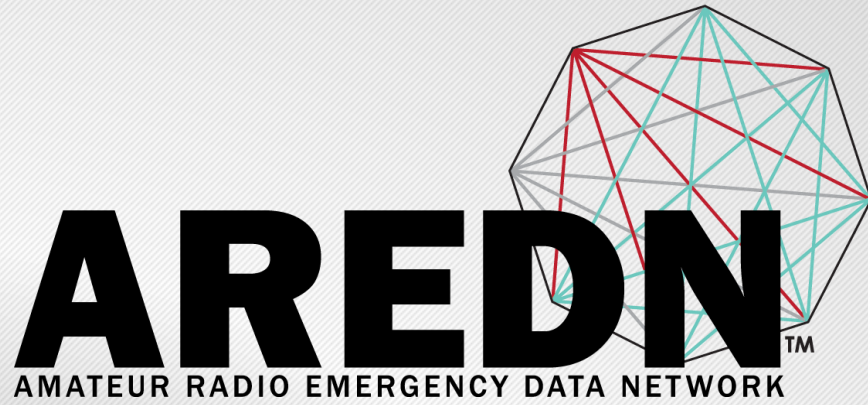


Presentation: [The Ham Radio Internet - a Progress Report](#)

System Administrator  
Abbott Labs

Orv Beach is a long-time Linux user, and has been a ham radio operator for even longer (license callsign W6BI). He's an ARRL Technical Specialist, and the Training Chair for the Southern California Linux expo. He's deeply involved in the build-out of the local ham radio "Internet" using off-the-shelf wireless equipment.





What we didn't foresee



# Ham Classes and VE Exam Sessions

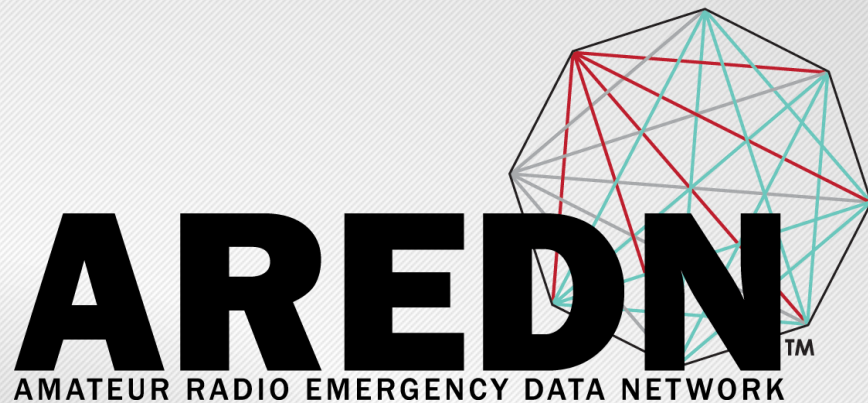




- Andrew, KK4ZUZ
  - Peter, KK6RUH
  - Patrick, KE0RSX
  - Steve, KC0EUW - Documentation
  - Eric, KC6WXC - Various
  - Ray, KK6RAY
  - Ryan, KI4VMI
- } New Device Support
- } New User Interface

## New Contributors





# IBM's Call For Code 2019



**CALL FOR CODE**



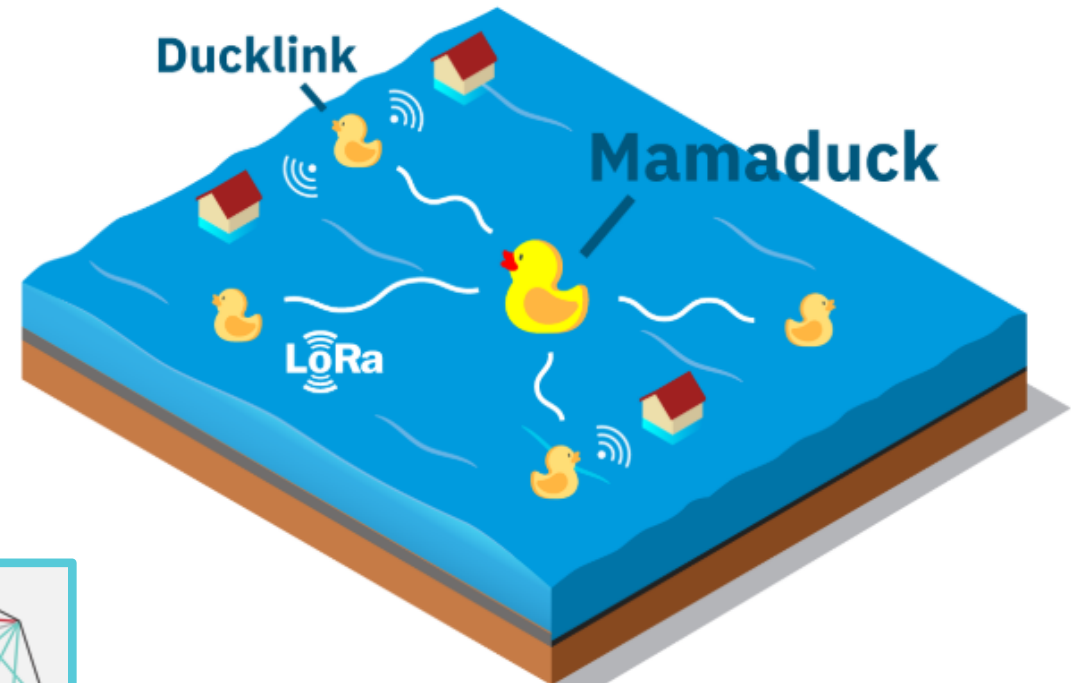
# IBM's Call For Code 2019



## How to build an internet when it's gone

---

Long Distance  
connections  
brought to  
you by:



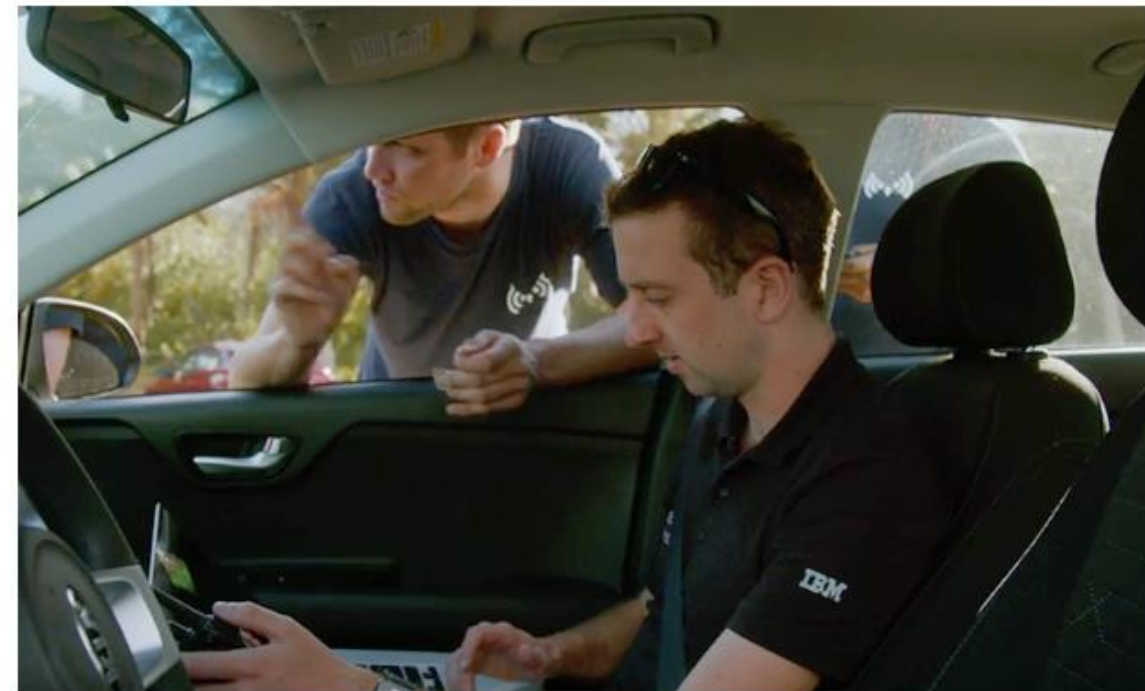
# IBM's Call For Code



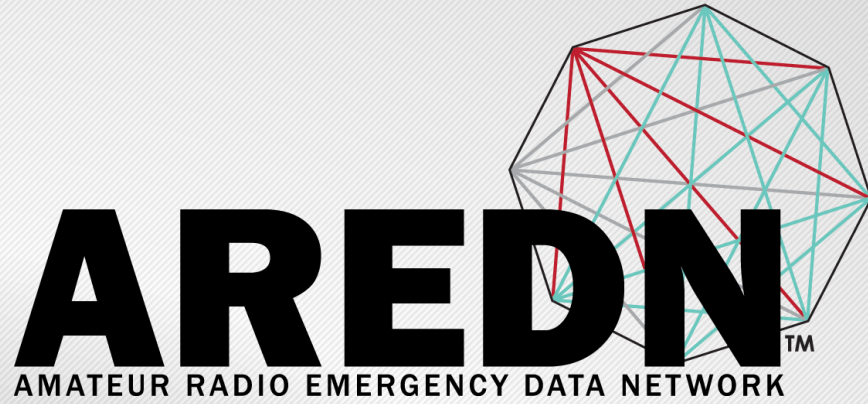
## 2018 Call for Code winner pilots mesh network in Puerto Rico

Following a natural disaster, first responders need an effective solution to prioritize relief efforts when connectivity is lost. Project Owl, the Call for Code 2018 winner, addresses this with a network of quickly deployed hotspots that can gather vital information from people in need.

[See this feature on Project Owl's Puerto Rico deployment pilot →](#)







# Updated Documentation

# Documentation



## AREDN Documentation

latest

### GETTING STARTED GUIDE

#### AREDN Overview

- Selecting Radio Hardware
  - Downloading AREDN Firmware
  - Installing AREDN Firmware
  - Basic Radio Setup
  - Node Status Display
  - Mesh Status Display
  - Advanced Configuration
- ### NETWORK DESIGN GUIDE
- Networking Overview
  - Network Topologies
  - Radio Spectrum Characteristics
  - Channel Planning
  - Network Modeling

### APPLICATIONS AND SERVICES GUIDE

- AREDN Services Overview
- Chat Programs
- Email Programs

Docs » AREDN Overview

[Edit on GitHub](#)

## AREDN Overview

The AREDN™ acronym stands for *Amateur Radio* open service-oriented community.

For many years amateur radio operators have been involved conveying their messages through the ICS-213 form. The message is then delivered to the recipient and then be handled through the radio.

This tried-and-true so-called emergency and event communication of traditional methods, with electronic form, with a radio, a Pactor, Fldigi, and other software.

In today's high-tech so-called emergency and event communication needs, short messaging and link

### Radio Spectrum Characteristics

#### Channel Planning

- Channel Contention
- Route Flapping
- Collocated Nodes
- Aligning Link Nodes
- Channel Planning Tips

### Network Modeling

#### APPLICATIONS AND SERVICES GUIDE

#### AREDN Services Overview

- Chat Programs
- Email Programs
- File Sharing Programs
- VoIP Audio/Video Conferencing
- Video Streaming and Surveillance
- Computer Aided Dispatch
- Other Possible Services

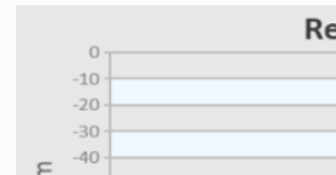
#### HOW-TO GUIDES

- AREDN How-to Guides Overview
- How to Use PuTTYGen on Windows to

Most of the latest AREDN™ devices use dual polarity antennas and MIMO features in the radios that exploit multipath propagation. However, if you are using single polarity antennas with "single chain" radios, another way to achieve signal separation for collocated devices is to orient the site's antennas so that one is vertically polarized and the other is horizontally polarized. This can result in a signal separation of up to 20 dB. Vertical polarization is usually preferred because it tends to be less susceptible to reflections and signal with clear line of sight. Note the same way.

## Aligning Link Nodes

The AREDN™ web interface provides a way to align link nodes. On the *Signal to Noise* graph. Slowly turn the antenna until you see the best signal, as shown by the focus on the antenna position with the *Sound* feature and align the antenna. Signal to Noise Ratio of 15 dB is achieved.



### Radio Spectrum Characteristics

#### Channel Planning

#### Network Modeling

#### APPLICATIONS AND SERVICES GUIDE

#### AREDN Services Overview

#### Chat Programs

#### Email Programs

- Citadel/UX
- Open Source Email Server
- Using WinLink to Send Email
- Example Email Service Comparison

#### File Sharing Programs

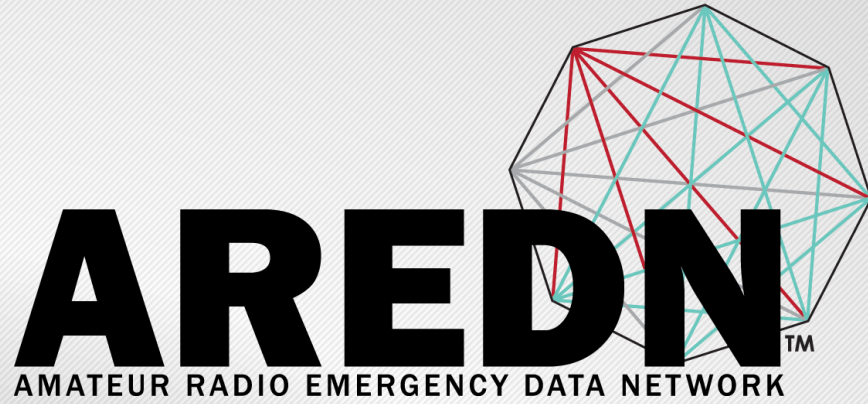
- VoIP Audio/Video Conferencing
- Video Streaming and Surveillance

## Using WinLink to Send Email

Although it is not typically used as a TCP/IP network, WinLink is familiar with [WinLink 2000](#) for sending messages across amateur radio frequencies. It is possible to configure WinLink for P2P for sending email with attachments across a radio link. A Windows computer with plenty of memory to run WinLink is required. Information link below for details about the specifications. The maximum attachment size is currently 5MB per message. For HF and Packet RMS stations. For additional information on Winlink located here: [Winlink Forum](#)







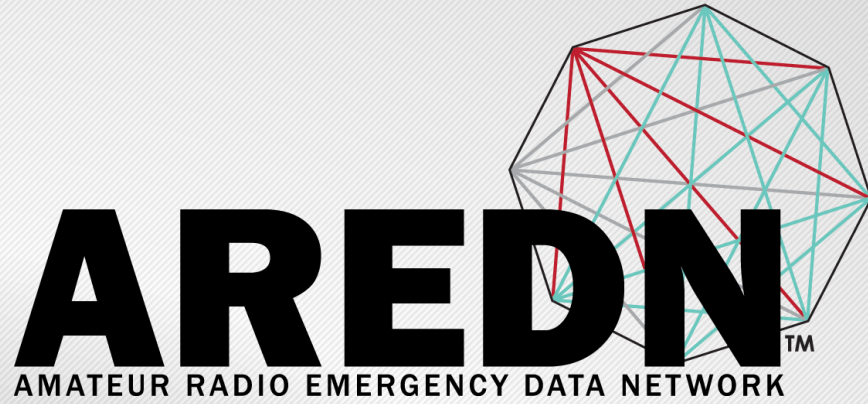
# Recent Development

# Recent Development



- 3.19.3.0 Released on March 23<sup>rd</sup>.
- Continue to add new devices. Check out the Supported Platform Matrix.
- Expect to add support for new “AC” devices. Benefit of AC is not yet understood in AREDN environments.
- In the Nightly Build: Max Link Distance parameter can now be calculated by the node. The result is dynamic and optimized. Seeing as much as 40% increase in link throughput.





# New Device Support

# Ubiquiti

Wide variety of devices for all topologies



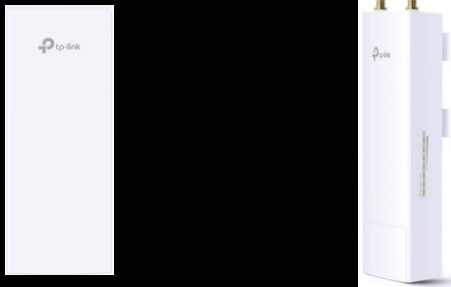
# MikroTik

Wide variety of devices for all topologies



# TP-Link

Ubiquiti look-alikes



# GL-iNet

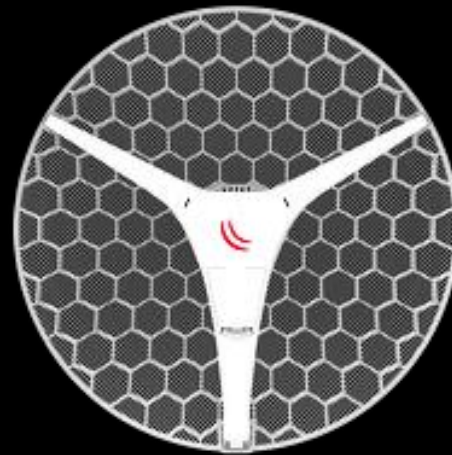




# MikroTik - Device Focus



LDF



LHG & LHG-XL



Economical  
Antennas



hAP AC Lite

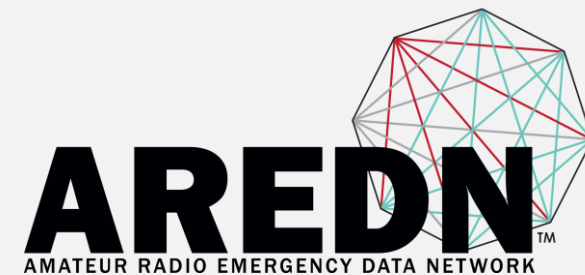
# Spec Comparisons for Long 5 GHz links



Manuf	Model	Antenna	Power	Ant Gain	IERP
MikroTik	BaseBox5	Rocket Dish	30	30	60
Ubiquiti	Rocket M5	Rocket Dish	27	30	57
MikroTik	LHG-5nD XL	Dish Included	25	27	52
Ubiquiti	Rocket M5	120° Sector	27	19	46
MikroTik	LDF-5nD	Satellite Dish	25	20	45



# GL-iNet - Device Focus



AR150 Mini



AR150 USB Microuter

# AR150 USB Use Case



A triage is setup in a public park. You've pre-loaded a dozen or more AR150 USB's.

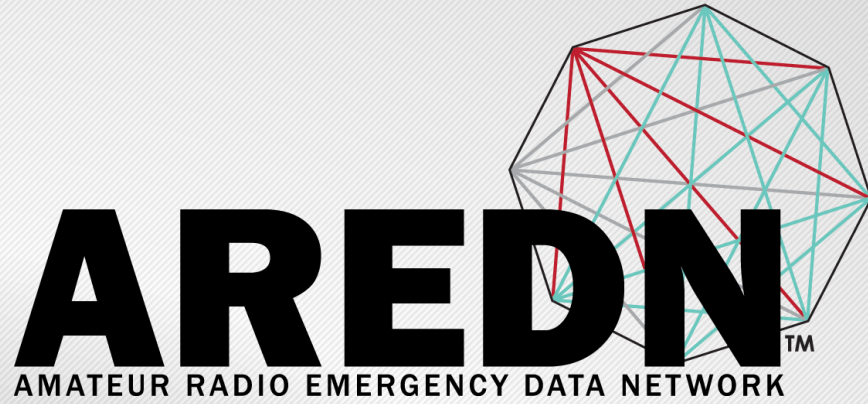
Sign them out to those needing access to the network via their own/company laptops.

Each laptop becomes an AREDN mesh node.

Network coverage expands with every laptop added.







# Applications for AREDN


# How will you use AREDN ?



WebEOC 8.2 Login

Username

Password





- Public Service / Public Safety
- Red Cross Disaster Services Technology
- Community Emergency Response Team
- Support MOUs with your municipal EOC
- Deliver paradigm changing services
  - VoIP & Chat with other sites
  - Cell Service Restoration - BYO
  - Access to cloud-based systems
  - Augment Winlink services





## Administrative

Advanced config  
iperf Speed Test  
Network monitoring  
NNTP Time services  
Antenna pointing/peaking

## User Applications

Air Traffic Control	Winlink
EmComMap / Tickets	DMR linking
CERT Damage Assessment	Web-based Email
MeshChat	Mattermost
Weather Stations	FTP / fileshare
Remote cameras	Website with network/node info
VoIP telephony (226 assigned numbers)	

# Applications Running on AREDN Networks



# PBX Configuration for VoIP Phones



FreePBX Support

UCP



FreePBX Administration



User Control Panel



Get Support



**FreePBX**  
let freedom ring™

FreePBX is a registered trademark of  
Sangoma Technologies Inc.  
FreePBX 14.0.5.25 is licensed under the GPL  
Copyright© 2007-2019

**SANGOMA**



# MeshChat



CHAT FILES STATUS LOGOUT

Mesh Chat v1.0

Zone: MeshChat

Call Sign: K6AH

Node: kd7vea-rocketdish-to-westmountain

Updated: 86 seconds ago

Send a Message

New Message

Enter message here

Channel:

Everything

Mesh Chat Users

2

Call Sign	Node	Last Seen
K6AH	<a href="#">kd7vea-rocketdish-to-westmountain</a>	2/14/19 9:33 AM
W6BI	<a href="#">ai6bx-2-chatpi</a>	2/14/19

Messages

Search

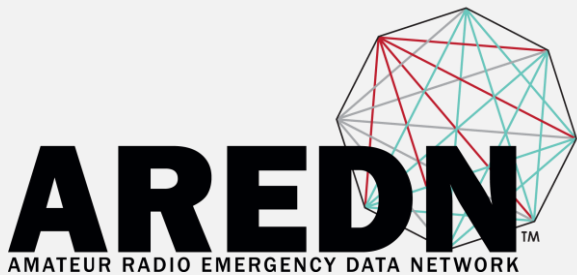
Enter search

Channel

Everything

Time	Message	Call Sign	Channel	Node
2/13/19 6:02 PM	Testing...	W6BI		<a href="#">ai6bx-2-chatpi</a>
2/13/19 6:01 PM	Just checking in	W6BI		<a href="#">ai6bx-2-chatpi</a>

# Node Management thru Smart Switches



TOUGHSwitch™ PoE PRO

STATUS

DEVICE

PORTS

VLANs

ALERTS

Tools:

Logout

Total Throughput 172 TX kbps 37.0 RX kbps

Status

Device Name: K6AH-Elsinore-ToughSwitch

Device Location:

Firmware: SW.v1.3.2

Date: 2015-07-17 22:51:24

Uptime: 1 day 19:18:30

Device MAC: 80:2A:A8:DF:8F:23

Port Status

Port	Name	Port Status	Link Status	PoE	STP State	MTU	Alerts
1	5GHz Backbone to Redlands	Enabled	100Mbps-Full	24V	Forwarding	1518	Off
2	3GHz Downlink to N Riverside	Enabled	100Mbps-Full	24V	Forwarding	1518	Off
3	2GHz Downlink to S Riverside	Enabled	100Mbps-Full	24V	Forwarding	1518	Off
4	2GHz Downlink to N Riverside	Enabled	100Mbps-Full	24V	Forwarding	1518	Off
5	3Ghz Downlink S Riverside	Enabled	100Mbps-Full	24V	Forwarding	1518	Off
6	5GHz Backbone to Sleeping Indian	Enabled	100Mbps-Half	24V	Forwarding	1518	Off
7	Camera	Enabled	100Mbps-Full	Off	Forwarding	1518	Off
8	Management	Enabled	Down	Off	Blocking	1518	Off

Port Statistics

Port	Name	RX Data	RX Packets	RX Errors	TX Data	TX Packets	TX Errors
1	5GHz Backbone to Redlands	1375945217	1234806	0	230703932	979975	0
2	3GHz Downlink to N Riverside	32296798	140863	0	1100714639	1132231	0
3	2GHz Downlink to S Riverside	86482703	439282	0	1472374475	1447618	0
4	2GHz Downlink to N Riverside	39250492	142563	0	1095815961	1134112	0
5	3Ghz Downlink S Riverside	37242938	145915	0	1096856328	1137787	0
6	5GHz Backbone to Sleeping Indian	121095258	281768	0	1056993576	1290701	151
7	Camera	1099545	15940	0	5044910	78361	0
8	Management	0	0	0	0	0	0

Reset Statistics

Total Throughput

RX: 62.5kbps

TX: 299kbps

Data Distribution

RX

TX

All | Last 20 sec

Port 1

Port 2

Port 3

Port 4

Port 5

Port 6

Port 7

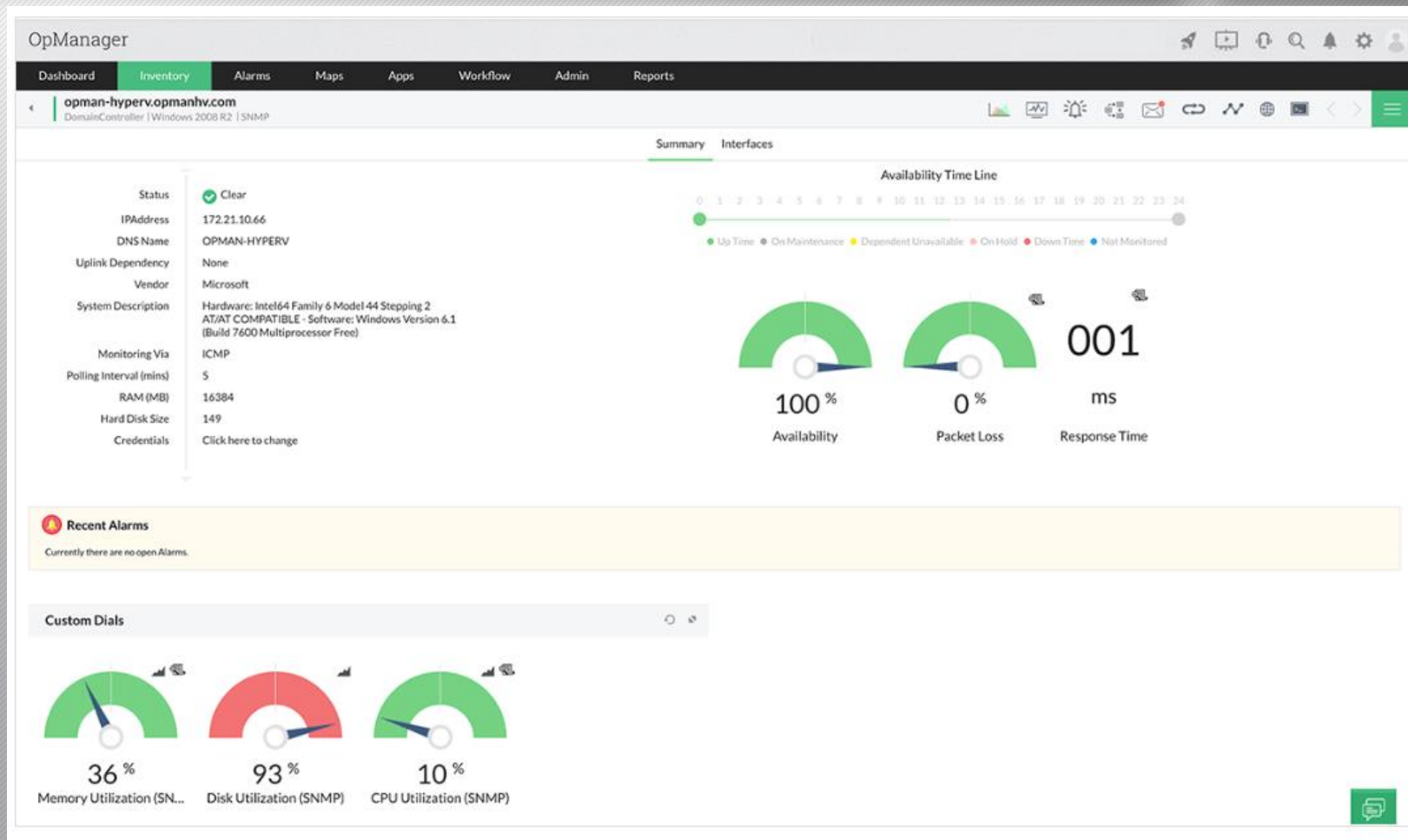
Port 8

GENUINE PRODUCT

© Copyright 2006-2015 Ubiquiti Networks, Inc.




# Network Management with SNMP



# Team Collaboration Systems



**Palo Alto Bank**  
@brad.griffen

FAVORITE CHANNELS

- Eric Foster, Tania Wilson
- Dev Agenda
- Jamie Wells** 2
- Help Desk
- SecOps Escalation
- Threat Briefings

PUBLIC CHANNELS +


- Browser Compatibility
- Customers
- Developer Meetings
- DevOps Talk** 4
- ISAC Talk
- Off-Topic
- Recruiting
- Release
- UX Design
- More...

PRIVATE CHANNELS +

- Android
- Confidential Bugs
- Developers: Private** 1
- Integrations


★ SecOps Escalation ▾  
Sec067 - Sec066 - Sec065 - Other Versions can be accessed on the [SecOps Repository](#).

Fri, June 14, 2019

**Jamie Wells** 3:12 PM


Hey @matt.santos, can you have a look at the latest Sec067 that came in? As always, do let me know if you have any queries.


Fri, June 14, 2019


**Sophie Watkins** 11:23 AM

@all please confirm with 🙌 that you've reviewed this week's threat briefings. @tania.wilson, please confirm we've loaded new indicators of Compromise into Splunk.

FactNote Threat Briefing (June 2019)






**Brad Griffen** 12:57 PM

We got an alert #IOC203 was triggered, investigating...

Write a message...


Thread  
Fri, June 14, 2019

**PaloAltoBank Incident Bot** BOT 4:02 PM


**Post-Mortem #Sec067**

Post-Mortem for Issue Sec067 attached.


Owner	Resolution Time
@matt.santos	59 minutes



Issue Sec067.pptx  
PPTX 2MB


**Jamie Wells** 4:04 PM

Great work @matt.santos! Complete in record time.



Write a message...

Add Comment





# EmComMap



EMCOMMAP v0.4b

Northeast Survey  
Traffic Net for ARES LAX NE

Tactical ID:  [Change](#)

[Documentation](#)

+

-

Traffic Operators Locations Incident

Incident: Northeast Survey

Description:

Incident start:

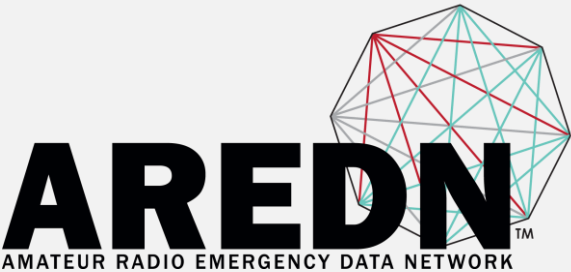
Incident end (blank if ongoing):

Info last updated:

[Update incident info](#)

Refreshed 2 minutes ago

# Tickets



Current situation - Redlands, CA    Viewing Regions (mouse over to view)    Normal 0, Medium 0, High 0

Change display:    Popout

Incidents

click item to view / edit, right click for act / pat / notes, Click headers to sort

No Incidents, please select another time period or add a new incident.....

Responders

click on item to view / edit, Click headers to sort

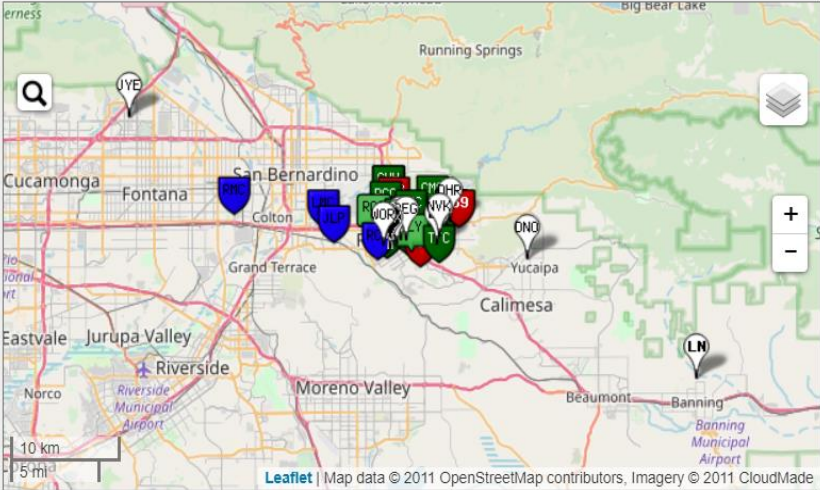
Icon ▲	Handle	Mail	Incidents	Status	M	As of
ACQ	K6ACQ			available ▼		27 11:42
BX	AI6BX			available ▼	AP	15 19:34
CER	R-CERT			available ▼		18 18:46
DHR	KG6DHR			available ▼		16 21:54
DNO	K6DNO			available ▼		23 19:02
FCX	KA6FCX			available ▼		23 14:20
JYE	KM6JYE			available ▼		23 15:01
LN	AJ6LN			available ▼		23 14:04
NVK	N7NVK			available ▼		23 14:36
REG	W6EOC			available ▼		23 10:52
WOR	KE6WOR			available ▼		29 07:37

Facilities

click on item to view / edit, Click headers to sort

Icon	Name	Mail	Status	Updated
261	Redlands Fire Station 261		Open ▼	23 14:24
262	Redlands Fire Department		Open ▼	23 14:24
263	Redlands Fire Department		Open ▼	23 14:25
ACH	Arrowhead Chrisitan Academy		Closed ▼	04 19:51
CC	Contemporary Club		Closed ▼	04 20:10
CMS	Clement Middle School		Closed ▼	04 20:09
CPS	Cope Middle School		Closed ▼	16 21:54
CVH	Citrus Valley High School Gym		Closed ▼	04 19:56
CVH	Citrus Valley High School Multipurpose Room		Closed ▼	04 20:05
FBC	First Baptist Church		Closed ▼	04 20:13
FMC	First United Methodist Church of Redlands		Closed ▼	05 06:49
JLP	Jerry L. Pettis VA Hospital		Open ▼	05 18:25

Show Assigned



Leaflet | Map data © 2011 OpenStreetMap contributors, Imagery © 2011 CloudMade

Redlands, CA



# Allstar Management via Web GUI



## Status for K8BKT - Node 44098

Last update - 02/14/2019 11:40:15 My IP - 76.27.25.238

[View this Node Graphically](#) [Search/Command another Node](#)

Selected system state	0
Signal on input	NO
System	ENABLED
Parrot Mode	DISABLED
Scheduler	ENABLED
Tail Time	STANDARD
Time out timer	ENABLED
Incoming connections	ENABLED
Time out timer state	RESET
Time outs since system initialization	2
Identifier state	CLEAN
Kerchunks today	0
Kerchunks since system initialization	2662
Keyups today	61
Keyups since system initialization	26398
DTMF commands today	0
DTMF commands since system initialization	49
Last DTMF command executed	22256
TX time today	00:12:0675
TX time since system initialization	90:12:15148
Uptime	3211:51:54
Nodes currently connected to us	2256
Autopatch	ENABLED
Autopatch state	DOWN
Autopatch called number	N/A
Reverse patch/IAXRPT connected	DOWN
User linking commands	ENABLED
User functions	ENABLED

<u>Node</u>	<u>Call</u>	<u>Description</u>	<u>Location</u>
44098	K8BKT	449.775 -	Pleasant Grove, Utah
2256*	VE3RTR	444.975-	Cobourg, ON

Node	Peer	Reconnects	Direction	Connect Time	Connect State
2256	72.142.154.178	0	OUT	11:25:50.61	ESTABLISHED

Host	Node	State
44.98.254.145:4569	44098	Registered

# Allstar via Pi-Star Application



Hostname: pi-star

Pi-Star:3.4.17 / Dashboard: 20190205

## Pi-Star Digital Voice Dashboard for K6TZ

Dashboard | Admin | Configuration

Modes Enabled

D-Star	DMR
YSF	P25
YSF XMode	NXDN
DMR XMode	POCSAG

Network Status

D-Star Net	DMR Net
YSF Net	P25 Net
YSF2DMR	NXDN Net
YSF2NXDN	YSF2P25
DMR2NXDN	DMR2YSF

Radio Info

Trx	Listening
Tx	445.480000 MHz
Rx	440.480000 MHz
FW	MMDVM:20170501

YSF Network

Linked to:	YSF2DMR
------------	---------

YSF2DMR

DMR ID	110629
YSF2DMR Master	
BM United States	..

Gateway Activity

Time (PST)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
08:45:16 Feb 14th	YSF	K5CAW	ALL at K6TZ	Net	0.6	0%	0.0%
22:21:55 Feb 13th	YSF	W6STP	ALL at K6TZ	Net	11.1	0%	0.0%
21:17:54 Feb 13th	YSF	WB6OBB	ALL	RF	1.0	0%	0.1%
21:06:24 Feb 13th	YSF	K6LCM	ALL	RF	0.9	0%	3.8%
20:51:59 Feb 13th	YSF	K6BPM	ALL	RF	0.8	0%	3.6%
20:51:27 Feb 13th	YSF	KI6FFA	ALL at K6TZ	Net	8.8	0%	0.0%

Local RF Activity

Time (PST)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
21:17:54 Feb 13th	YSF	WB6OBB	ALL	RF	1.0	0.1%	
21:06:24 Feb 13th	YSF	K6LCM	ALL	RF	0.9	3.8%	
20:51:59 Feb 13th	YSF	K6BPM	ALL	RF	0.8	3.6%	

















Pi-Star / Pi-Star Dashboard, © Andy Taylor (MW0MWZ) 2014-2019.  
ircDDBGateway Dashboard by Hans-J. Barthen (DL5DI),  
MMDVMDash developed by Kim Huebel (DG9VH),  
Need help? Click here for the Facebook Group  
or Click here to join the Support Forum  
Get your copy of Pi-Star from here.



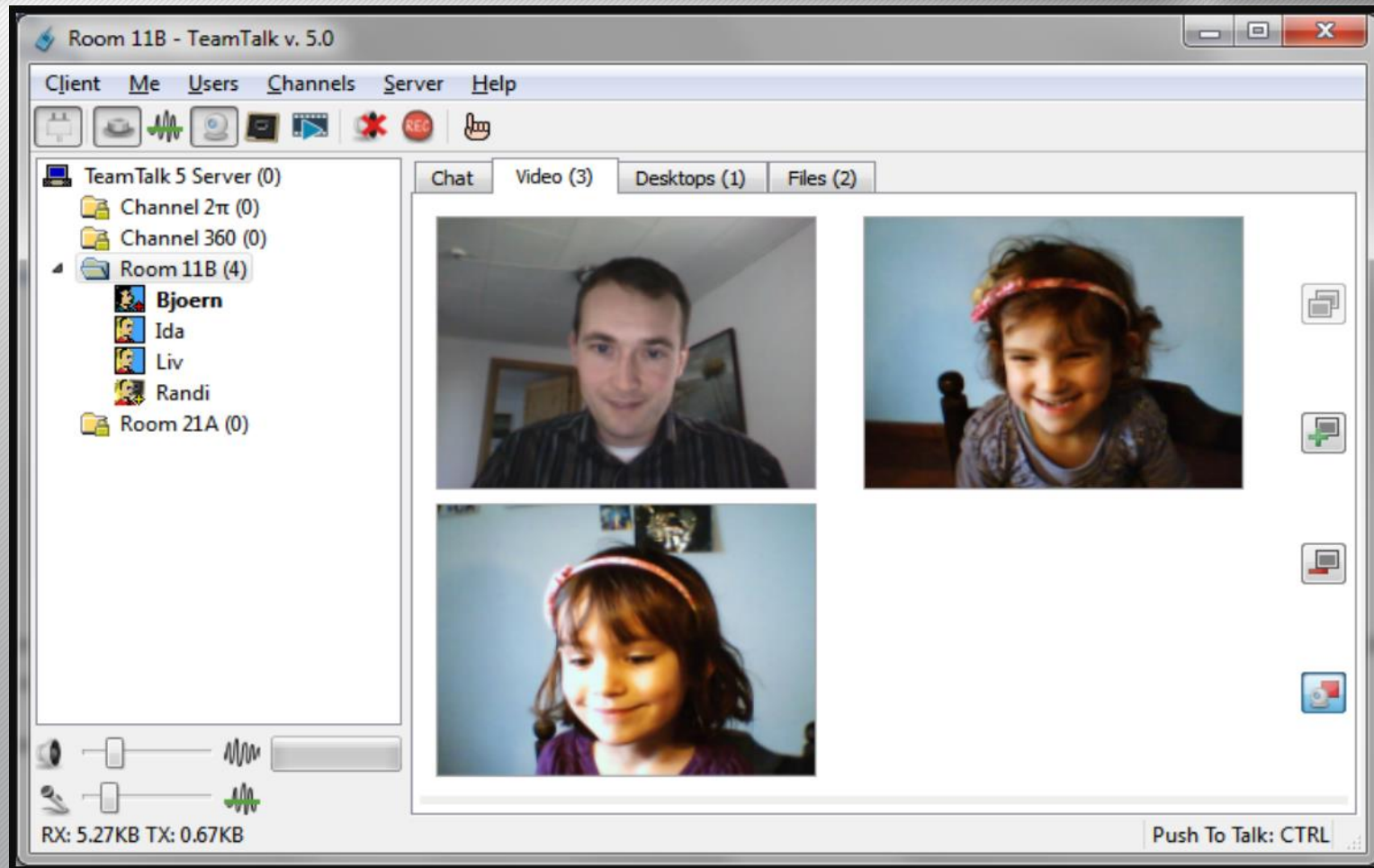
# Fileshare / FTP



## Index of /

	Name	Size	Date Modified
	<a href="#">3CXPhone6.msi</a>	13.3 MB	8/21/16, 5:00:00 PM
	<a href="#">AV.exe</a>	6.0 MB	9/5/18, 5:00:00 PM
	<a href="#">Camera Uploads/</a>		1/28/19, 4:46:00 PM
	<a href="#">DMR Software/</a>		12/25/16, 4:00:00 PM
	<a href="#">emergencycommplan.pdf</a>	2.5 MB	10/14/18, 5:00:00 PM
	<a href="#">ExtIO_RTL_TCP.zip</a>	58.2 kB	10/11/16, 5:00:00 PM
	<a href="#">HDSDR/</a>		10/11/16, 5:00:00 PM
	<a href="#">ipscan-3.5.2-setup (1).exe</a>	3.1 MB	7/23/18, 5:00:00 PM
	<a href="#">js8call-0.7.3-devel-win32.exe</a>	18.3 MB	10/10/18, 5:00:00 PM
	<a href="#">KD7BKO Shared Docs/</a>		3/19/17, 5:00:00 PM
	<a href="#">My radio software/</a>		6/14/17, 5:00:00 PM
	<a href="#">P2P ID Finder Software/</a>		9/30/16, 5:00:00 PM
	<a href="#">Packages/</a>		10/23/16, 5:00:00 PM
	<a href="#">phpsysinfo/</a>		11/5/16, 5:00:00 PM
	<a href="#">sdrsharp-x86/</a>		11/10/16, 4:00:00 PM
	<a href="#">South-Tower-Camera/</a>		4/18/17, 5:00:00 PM

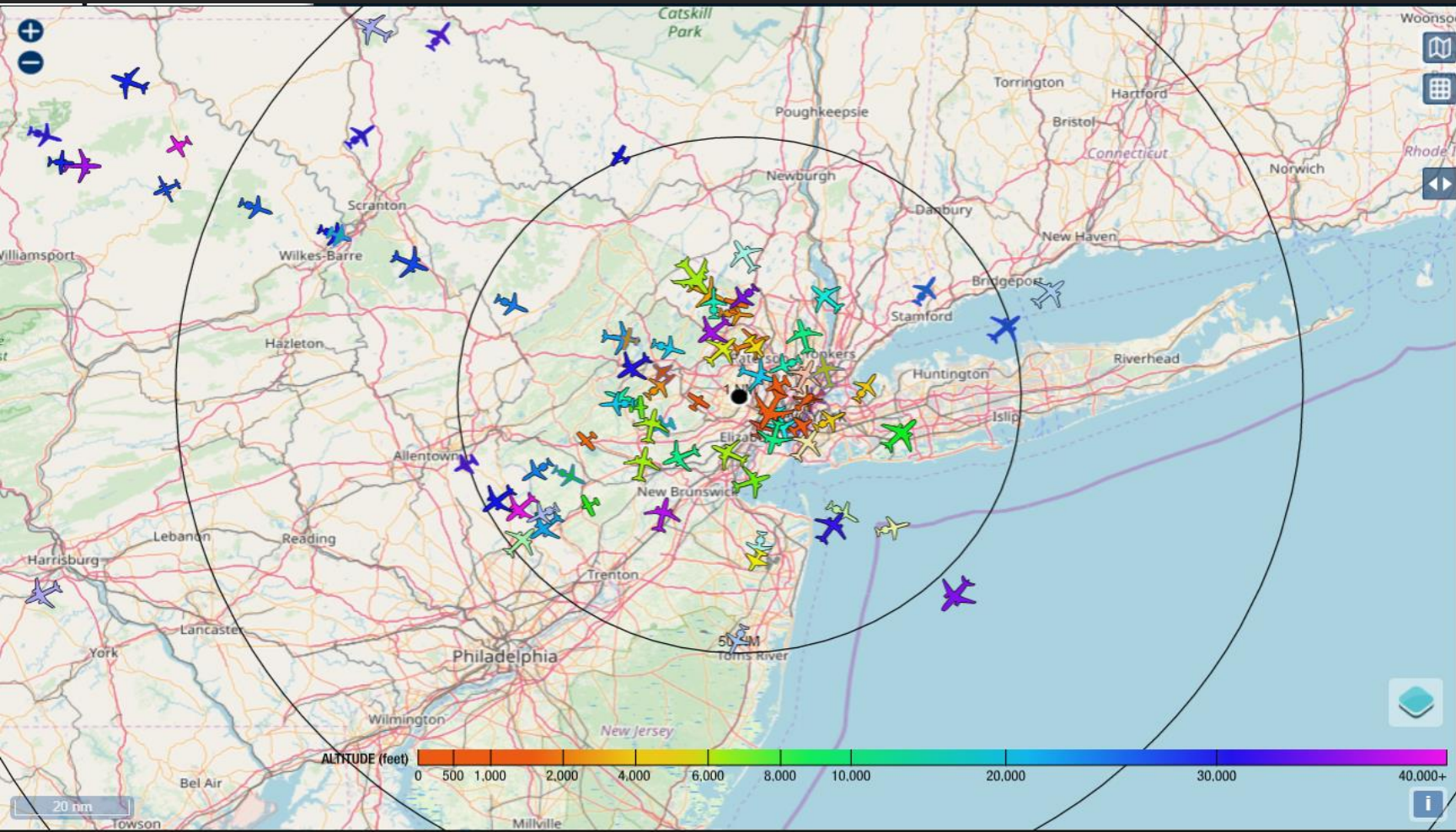
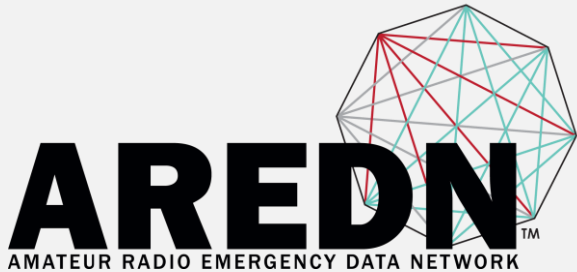
# TeamTalk Video Conferencing / Fileshare



<http://boothoverheadcamera.local.mash/browse/index.asp?id=1558185023384>



# Air Traffic ADS-B / SDR Dongle



Total Aircraft: 102  
With Positions: 85

Messages: 635.6/sec  
History: 5757 positions

Filter by Altitude:  ft to  ft Filter Reset

ICAO	Ident	Squawk	Altitude (ft)	Speed (kt)	Distance (NM)	Heading
AD6884	<a href="#">AAL2287</a>	4033	18,975	397	5.2	10
A8C4D8	<a href="#">UAL18</a>	2465	1,100 ▼	135	6.2	20
C01EC5	<a href="#">POE130</a>		ground	19	7.0	2
AAB37C		3042	1,375	202	7.0	24
A936FA	<a href="#">N693MM</a>	1200	1,025 ▲	104	7.5	3
ADA227	<a href="#">JBU516</a>	3223	16,400 ▼	321	9.3	16
ACB285	<a href="#">AAL1489</a>	3567	4,875 ▲	229	9.5	4
A2CFA2	<a href="#">SKW3846</a>	1735	12,175 ▲	261	10.0	19
478F43	<a href="#">SAS909</a>	2451	4,375 ▼	282	10.0	14
A6F280	<a href="#">LXJ547</a>	2643	14,925	298	10.0	24
A48438	<a href="#">EJA390</a>	3656	2,625 ▼	241	10.6	6
ACBF73	<a href="#">N920PD</a>				11.0	
A1AD1F	<a href="#">N207MH</a>	0327	1,425 ▲	85	11.1	1
AC0A22	<a href="#">AAL1333</a>	3035	5,850 ▲	225	11.2	29
A07CBB	<a href="#">N130RU</a>	1200	1,400	97	11.8	4
A08095			200 ▼	123	12.1	7
A7D464	<a href="#">N603WM</a>	3310	1,300	192	12.3	2
2AC772			200 ▼	87	12.6	5
A9RA85	<a href="#">N726H</a>	0307	1,900	6	13.2	23



# ARES Informational Site



*Los Angeles Emergency Communications Team*

Home

## Los Angeles Emergency Communications Team

The Los Angeles Emergency Communications Team ("LAECT") is a group of dedicated individuals committed to training and education in all aspects of emergency preparedness, management and response, with an emphasis on emergency communications.

LAECT partners with cities, community groups and other preparedness organizations to coordinate and provide practical preparedness and communications training throughout Southern California. Its members have received specialized training related to emergency preparedness, including Community Emergency Response Team ("CERT"), and the federal Incident Management System and National Incident Management System, both used to manage response to disasters and emergency situations by all levels of government. They also actively participate in numerous preparedness exercises each year, including the California ShakeOut, the California Statewide Medical and Healthcare Exercise and various local and regional exercises.

LAECT also works cooperatively with the Los Angeles Section of Amateur Radio Emergency Service ("ARES LAX"). ARES LAX encompasses all of Los Angeles County, encompassing more than 4000 square miles, and its more than 10 million residents. ARES LAX is the largest ARES Section, and the only one comprised of a single county. There are more than 22,000 Amateur Radio operators licensed in Los Angeles County.


As its primary mission, ARES LAX provides backup and emergency communications support to the Los Angeles County Medical Alert Center and almost 70 hospitals throughout the County, including virtually all "911 receiving" hospitals (those with emergency departments). ARES LAX is recognized as a formal component of the Los Angeles County Emergency Medical Services Agency Emergency Communications Plan.

*FCC station license KA6ECT*



# Node and Service Info





Los Angeles Emergency Communications Team

Home

## AREDN Mesh Nodes

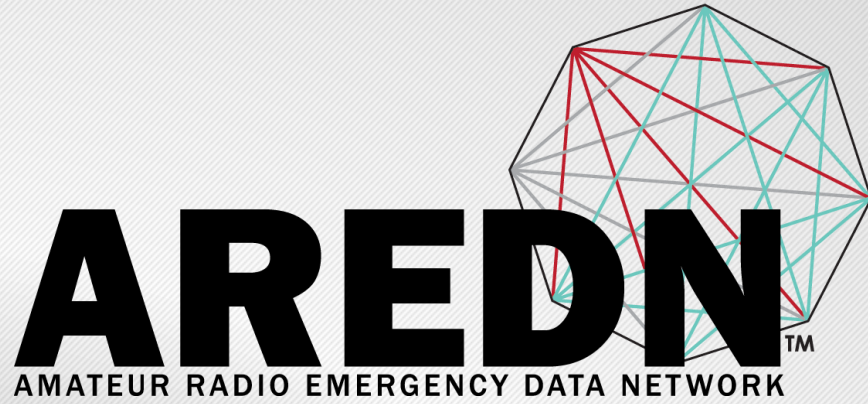
Located at Huntington Hospital in Pasadena, California (DM04WD)

KA6ECT-PAS-NBM5-60-241-34	5 GHz link to JPL
KA6ECT-PAS-NE-RM5-GPS-42-127-62	5 GHz, 120 degree sector pointing northeast
KA6ECT-PAS-SE-RM5-GPS-42-129-169	5 GHz, 120 degree sector pointing southeast
KA6ECT-ARHP-76-210-212	2 GHz device linking node
KA6ECT-BM2-170-202-183	2 GHz campus access
KA6ECT-BM2-170-201-235	2 GHz campus access

Other AREDN mesh nodes are operated by individual LAECT participants.

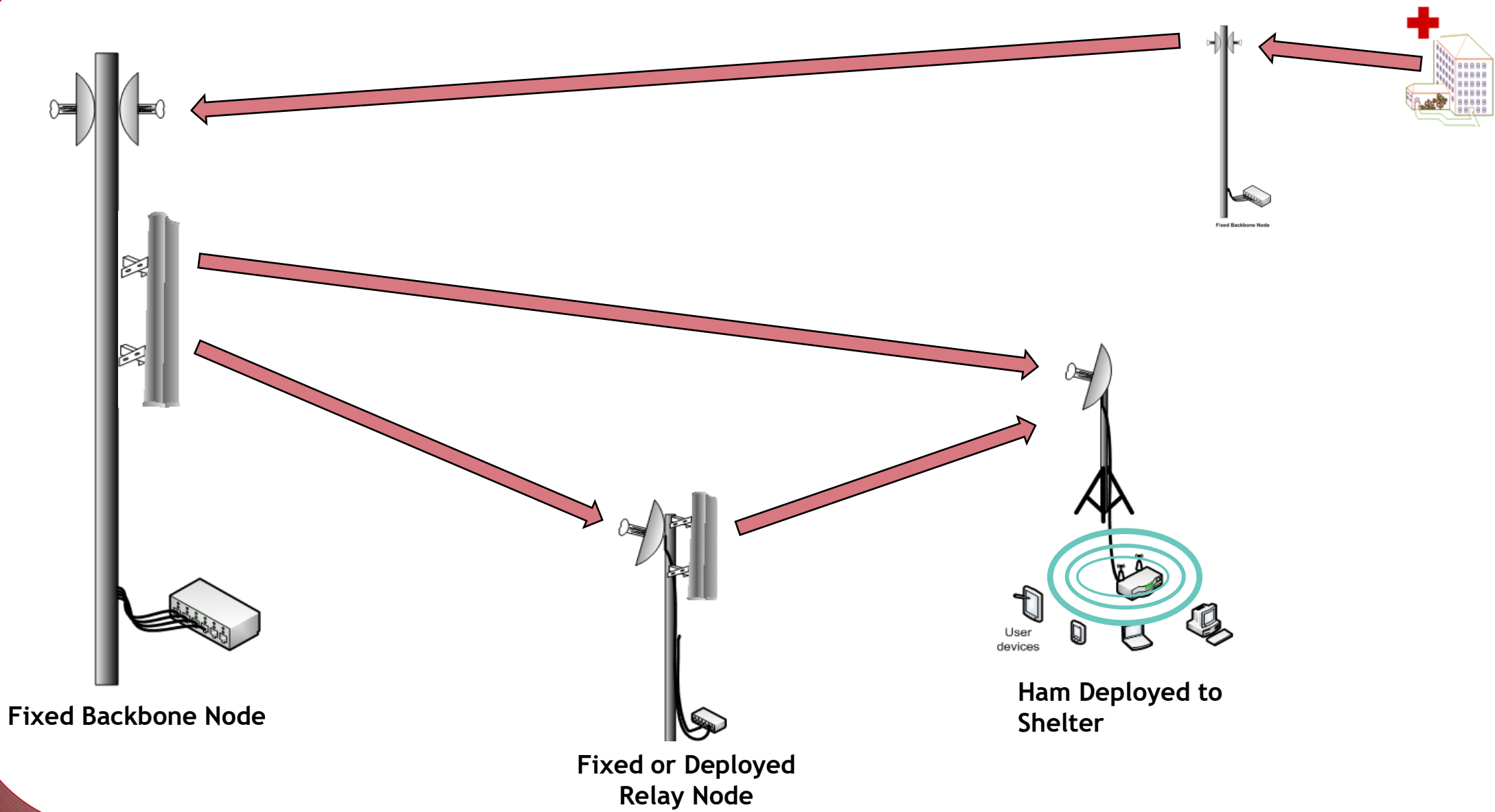
## AREDN Mesh Services

Winlink RMS gateway KA6ECT-10 with RMS Relay, connecting to Winlink CMS  
VHF packet, 145.050 MHz, 1200 baud  
UHF packet, 431.125 MHz, 9600 baud  
Mesh access using Telnet or Telnet Post Office session in Winlink Express, 10.205.45.75  
Winlink Telnet Post Office for local messages, no link to CMS, 10.205.45.70  
Anonymous FTP server, 10.205.45.70 (files may be deleted at any time)  
■ NTP service, Stratum 1 (provided by W6GSW), 10.101.205.250

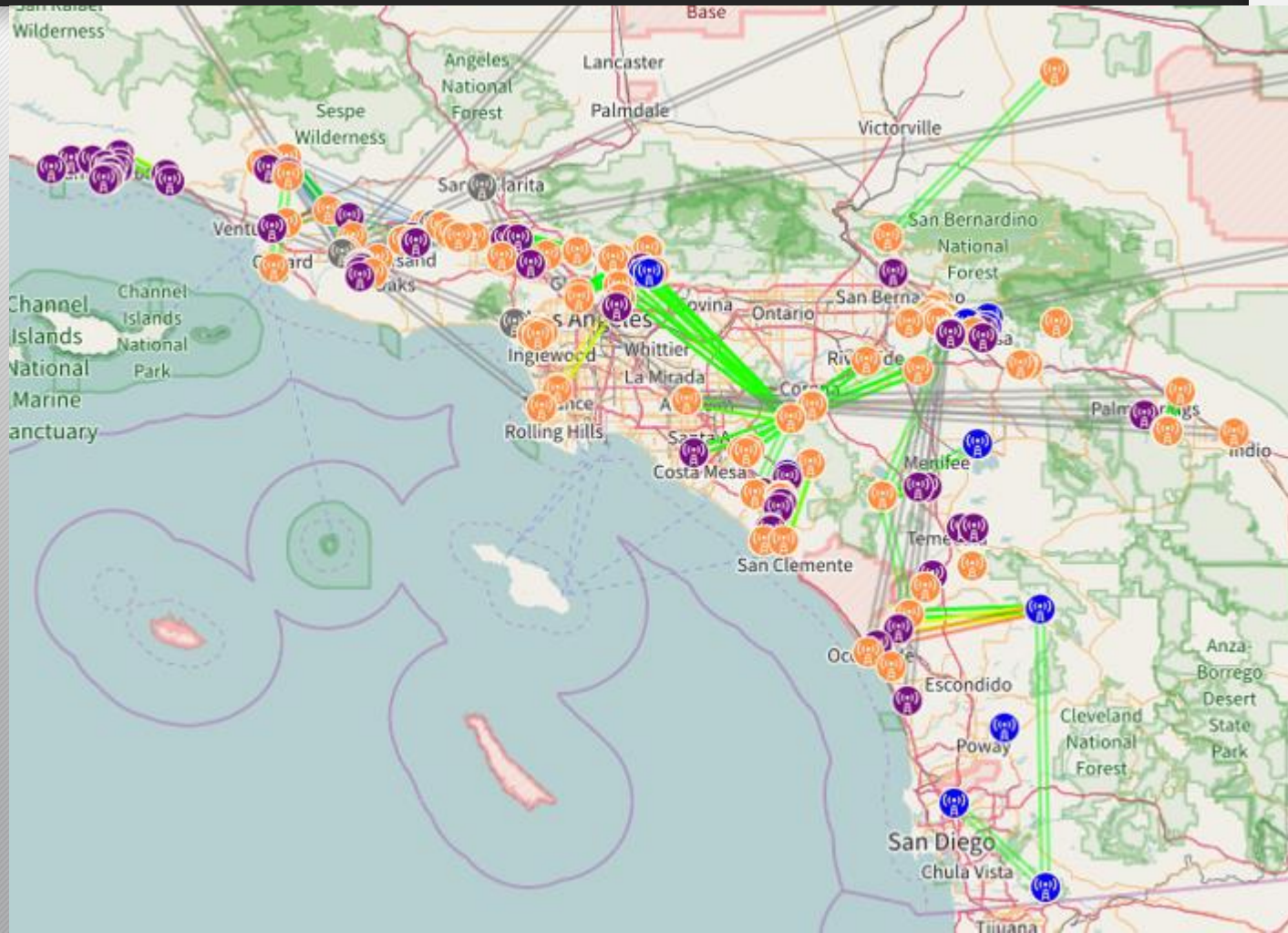


# AREDN in the SW Division



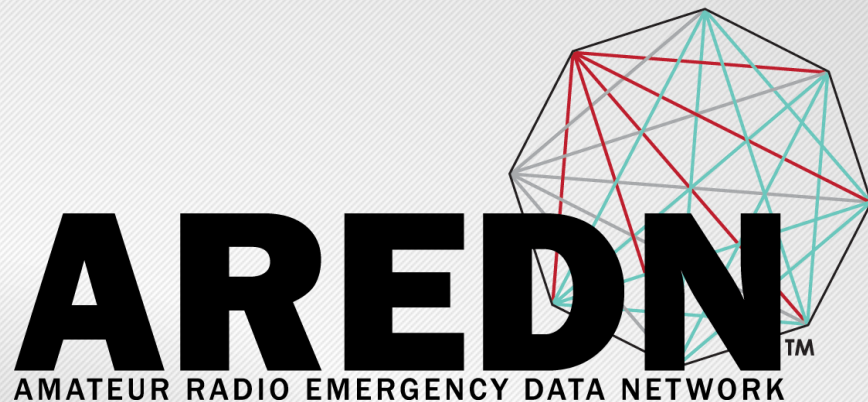


# Southwestern Division



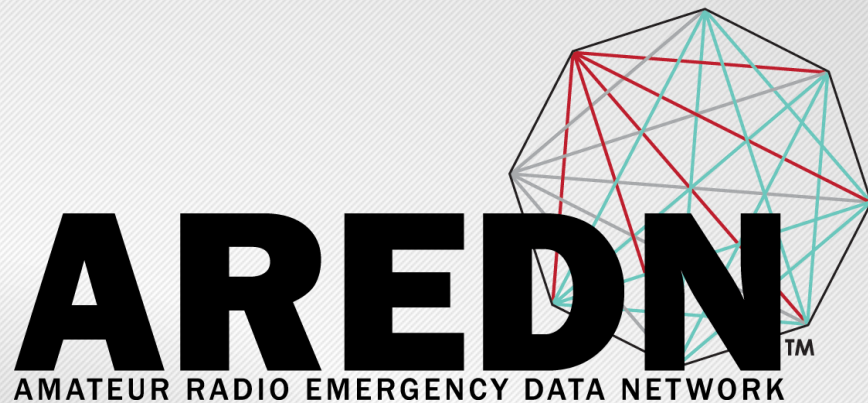
**Nodes: 450+**  
**OLSR Routes: 1200+**





## For More Info

- [WWW.AREDNMesh.ORG](http://WWW.AREDNMesh.ORG)
- QST June 2017, “AREDN - A High-Speed Data Network”
- QST Feb 2019, ARRL, Steve Ford, WB8IMY, article
- Search YouTube, HamRadio 2.0, HamRadioNow videos



## Contact Info

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[www.arednmesh.org/forum](http://www.arednmesh.org/forum)



- Randy, WU2S, Webmaster, President
- Joe, AE6XE - Lead Developer
- Darryl, K5DLQ - Lead Developer
- Andre, K6AH, Project Manager

Core Team

