

Features and Benefits

Getting out of the WIFI band and onto ham-only channels on 2.4 and 3.4 GHz SIGNIFICANTLY improved the performance of our local network, and the tools and metrics in the latest release give us a much better understanding of our link performance.

Exclusive Part 97 Channels	AREDN™ offers two channels on 2.4 GHZ, 24 channels on 3.4 GHz and 7 non-shared channels on 5.8 GHz that are not shared with Part 15 users.
Over-the-Air firmware upgrades	Changes to firmware can be done over an RF link without physical access to the node.
Maximum data rate of 130 Mbps	802.11n has been added to the RF protocol. This improves the maximum data rate capability from 54 Mbps to 130 Mbps and allows AREDN™ nodes to take advantage of the Ubiquiti MIMO (concurrent data channels in both the vertical and horizontal polarization domains), although proportional data rate increases can also be achieved on non-MIMO devices.
Low investment entry	Portable nodes with cable and network switch can be established inexpensively; backbone nodes with multiple transceivers and cable are affordable.
Rapid deployment and implementation	Portable nodes can be setup in a few minutes.
Multiple antenna choices	There are many choices for sector (60-, 90- and 120-degree) antennas and highly directional (Yagi and dish) antennas.
Interfaces easily with other Internet capable devices	An AREDN™ network enables emergency responders to use familiar devices such as smart phones, tablets and laptop computers.



AE6XE Orange County California 3 node installation

Practical EmComm Uses

Many applications are available to support the critical communications requirements of CERT, law enforcement assistance, ARES, RACES and events such as fire and hurricane watches.

Telephones

- Voice over IP telephone systems
- SIP-based direct-dial calling to similarly configured smartphones within the network
- Gateway to PSTN when Internet is available to a node
- Asterisk and FreePBX

Cameras

- Streaming video with IP webcams
- Skype-like video conferencing
- VideoChat

Keyboard to Keyboard

- Email
- Chat applications – MeshChat

Mapping

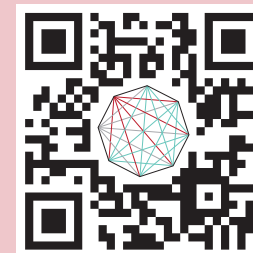
- Open Street Map
- HTML mapping with Google APIs

Database and File Sharing

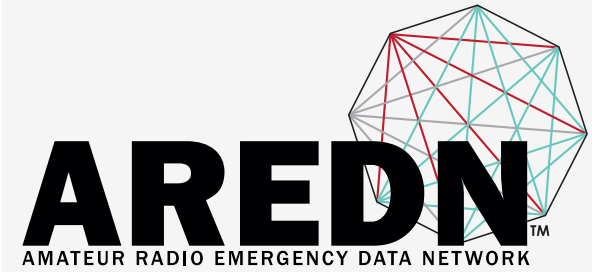
- CERT data gathering
- Cloud-based (OwnCloud) file sharing
- Google Person Finder

Network Monitoring

- Nagios
- Zabbix
- Iperf
- SNMP



Need Help?
Contact AREDN™
www.aredn.org



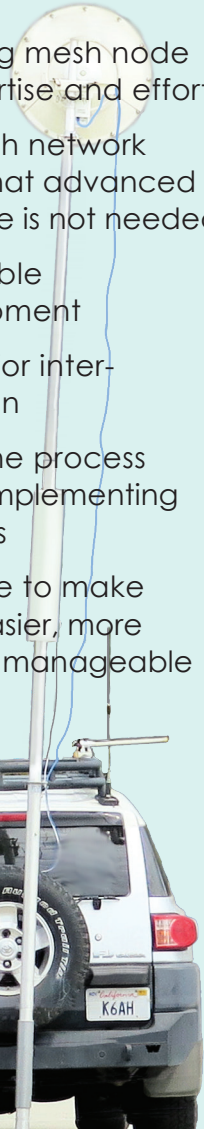
AE6XE and KE6BXT Pleasants Peak nodes

Delivering quality, high-speed, data communications for Emcomm via Amateur Radio

Project Objectives

The AREDN™ Project's focus is Emergency Communications (EmComm). It seeks to provide hams a means to implement this technology in practical ways to support local and regional emergency communications needs. To that end, the project's objectives are to enable hams to:

- Stand up a working mesh node with minimal expertise and effort
- Configure the mesh network automatically so that advanced network knowledge is not needed
- Use low-cost, reliable commercial equipment
- Define standards for inter-network integration
- Support those in the process of designing and implementing EmComm networks
- Refine the software to make implementation easier, more reliable, and more manageable



K6AH mobile nodes with dish and sector antennas

AREDN™ In Use

The Swallows Day Parade in San Juan Capistrano, California is, according to its organizers, the largest non-motorized parade in the United States. Hundreds of volunteers worked with local officials to maintain public safety among the estimated 35,000 people who attended the 57th annual event. A small team of FCC-licensed amateur radio operators who belong to the Radio Amateur Civil Emergency Service (RACES) provided specialized communication services.

The RACES team developed a plan to provide real-time video camera coverage of the parade route to support the Sheriff's department and emergency response agencies. Orange County Sheriff's Administrative Sgt. Joseph Cope noted that "This mesh camera system provided by RACES members was a very valuable tool for our command staff. As we were taking the calls, we could see the activity taking place in real time." In a meeting with city staff, he also stated, "The parade was the safest in years. Incredibly, there was only one arrest for fighting, which just happened to take place in the cameras view."

The parade cameras sent images across the radio network to the Orange County Sheriff's Department state-of-the-art Mobile Command Center (MCC). This MCC is a semi-tractor trailer with generated power and patch panels for video, data, and radio needs, including more than a dozen high-definition monitors positioned both internally and externally.

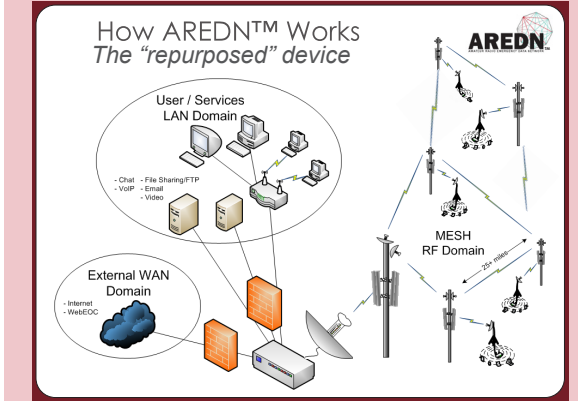


Orange County Mobile Command Center

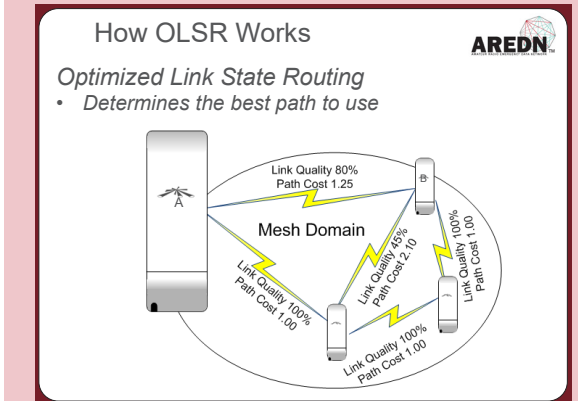
How It Works

In the AREDN™ schematic model illustrated below we see the familiar external and user domains... although the user domain now contains computers which deliver services such as email, FTP, VoIP, chat, etc.

The new domain here is an RF mesh network which forms the business end of the AREDN™ technology.



The four devices, all Ubiquiti NanoStations, illustrated below have formed a "mesh."



The route data will take through this network is dependent on the reliability of the links between them.