AREDN

Amateur Radio for the 21’st Century

What is AREDN?

AREDN is the **Amateur Radio Emergency Data Network**. It is made up of nodes that form a self healing mesh. This creates a stable working computer network much like the internet, but does not rely on existing infrastructure and repairs itself if some nodes in the system drop out.

Digital Communications

Served agency communications are increasing more data intensive pushing more communications toward digital modes over voice.

Packet - up to 1.2 kbits/second

VaraFM - up to 25 kbits/second

AREDN - up to 1000 Mbits/second

Tools served agencies use daily

Where AREDN fits in?

- First, it is just another tool in the tool box.
- It provides capacity similar to what served agencies are using daily.
- Today's ham radio experience is often quite hybrid using the internet where available as part of its infrastructure. AREDN can be Internet independent or be tunneled through the internet bringing the assets of the entire AREDN network to each user. All assets in a mesh network are available to all stations.

What equipment is used?

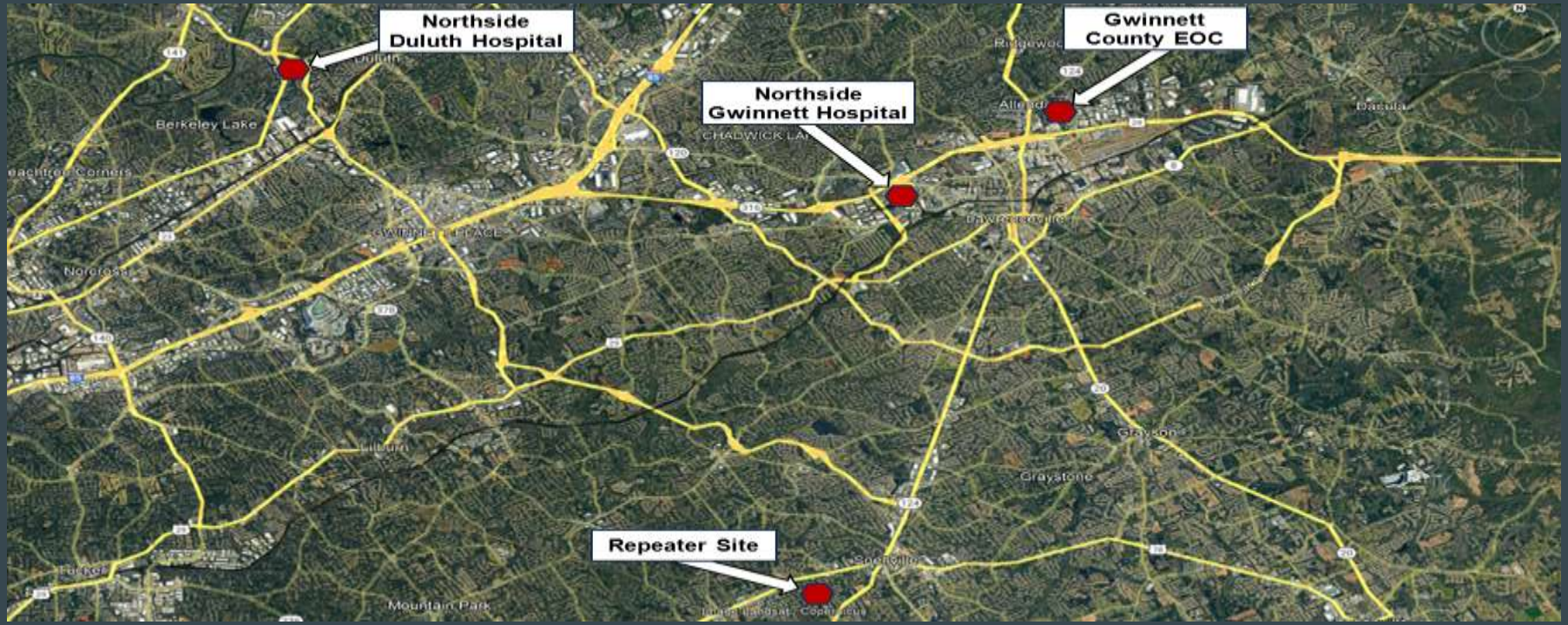
Equipment Considerations

- A broad selection of popular devices can be flashed with AREDN firmware for use with a data network
  - MikroTik
  - Ubiquiti
  - TP-Link
  - GL-iNet
- Consider if you are needing local or long haul use
  - Local equipment uses omnidirectional antennas or 120 degree sector antennas.
  - Long-haul antennas can be very focused and very strong. A simple MikroTik LDF-5 can be focused by a discarded satellite dish yielding 1000W ERP! Other purpose-built dish antennas like the PowerBeam-M5-620 carry a line of site up to 20 miles!
  - Like most antennas it is...Location, Location, Location!

Working AREDN Network

- Let's take a look at a typical off-grid application. I have assembled a go-kit with the basic features helpful in a deployment.
- They include:
  - VoIP phones with a PBX
  - Video surveillance
  - Access to the larger southeastern AREDN network
  - local mail server and access to the internet.
- Keep in mind that HTTPS traffic is forbidden on Part 97 networks as it is encrypted. Access to Winlink via the CMS is a perfectly acceptable use for AREDN. Of course this would require internet tunneling.

Proposed Infrastructure:



Field Deployment:

Long Haul Radio

Snellville Repeater Site:

- All our assets belong to our served agencies.

Gwinnett County
EOC

GNR District 3-4 Health Department Headquarters.

Northside Gwinnett Hospital.

Northside Duluth

Simulated Deployments

- JOTA
  - Provided Point To Point connect between ARES trailer and pavilion
  - Deployed two VoIP phones and two IP cameras
  - Access to broader mesh via tunneling
- Stone Mountain Hamfest
  - Multiple point to point connections

Proposal Deployments / Tabletop Exercises

- Memorial Day Parade
  - Provide camera support for assembly point at church and high school to parade director
  - Potential VoIP communication between parade director and assembly point
- GA Death Race / GA Jewel
  - Both are ultramarathons in N GA Mountains
  - Provide camera support to ensure runner check-ins aren't missed
  - Provide race status / communication to aid stations to allow them to self-serve
  - Balance workload among operators

How do we benefit:?

- Tools in the toolbox.
- Our own communications system for pleasure and for grid down.

- We serve our served agencies and thereby have access to a feature packed system.

- We can connect by tunneling to the rest of Georgia, the Southeast, and the USA.

Where do we start?

- Learn to flash a router. Example, MikroTik or Gl-inet.
- Build a go-kit.
- Build a network.
- Practice independent deployment.
- Add mail, chat, phones, server, IP cameras etc.

Getting Started

- http://www.arednmesh.org is the go-to site for AREDN
  - Supported Devices: http://downloads.arednmesh.org/firmware/html/SUPPORTED_DEVICES.md
  - Current Software: https://www.arednmesh.org/content/current-software
- YouTube videos
  - Overview - https://www.youtube.com/watch?v=zXEV18FuruM
  - Flashing Mikrotik Nodes - https://www.youtube.com/watch?v=B3LEAAsIWEA

Remember, we would not have repeaters, let alone frequencies to operate on without our commitment to communications in emergencies.
These served agencies will provide us with the connections. We will in turn be there for our fellow citizens when emergencies happen.

How Much Would the AREDN Infrastructure Cost?

- Expect something on the order of $3000-4000 for 5-6 sites.
- Adding battery and solar would be a very good idea. This would make the sites fully independent of commercial power.
- We could reasonably make a proposal for grant money from ARDC for this project.
- We would need a solid proposal with buy-in from our served agencies.
- Further development would be ad hoc and incremental involving mostly members own links.

DEMO

Questions?

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