Concerns of Implementing a Standardized Digital Communications System for ARES

November 27, 2004

My original letter was never designed to kill any product nor directly attack any individuals. Just to express technical concerns and to get some people to start thinking of the big picture of implementing a nation wide digital system before full commitment. However in retrospect, the previous letter did carry a slant when read, that was not my intent. I have therefore retracted the original document and have reposted this in it's place. To the best of my abilities I have attempted to be as objective as possible. Several of my previous statements have been found to be based on unsubstantiated information or disinformation provided to me and I have therefore removed them.

In defense of the WINLINK system I am beginning to see the development of several features either now or down the road as futures that are appear to bring it to a more mature product phase. Which resolve some of the issues noted previously and below.

Regardless of product, here are the technical challenges for any digital Amateur Radio system. I am a big supporter of a common interface for Digital communications for several years, this has always been the largest down fall of digital communications as noted by at least a few dozen sources.

General Concerns:

1. Internet:
When the most recent round of Microsoft worm viruses we were seeing delays of hours to another site from Indiana State University, just because the internet was swamped across the country. Web browsing came nearly to a complete halt during those attacks as well. The daily update of the Homeland Security Status that I receive has a section called "Information Technology and Telecommunications" which includes a Internet Alert Dash board, the internet is a real target.

Ham radio has a history of saying "When all else falls, Ham Radio" but if we hinge on the internet, what does that do our credibility? To say the Internet will never have problems will be like telling all hams to get Cell Phones and sell their gear. Leveraging the internet to advantage is good, hinging on it is bad.

Use of SMTP mail as an open standard has merit. However, mail messages traveling through the internet may travel in a few seconds or may take hours. There is no metric that says once it goes into the internet it will take exactly x.y minutes to reach a point. SMTP mail delivery tries for 4 hours before sending an ACK back to the user that it could not deliver the message but will try for 5 days. If we are providing real time communications 4 hours or 5 days is way to long for a status report.

Many SPAM prevention tools by Internet Service Providers are very rudimentary. For example if the system detects a mail server running on a remote node it can be shut down at the ISP or the ports blocked so mail can not be sent unless you use the SMTP server of your ISP. This may impact portions of the any e-mail based system that uses the internet.

2. Disaster Recovery:
Any digital system has to have a disaster recovery plan is for Servers that are at the core of the digital messaging system. While most systems have built in recovery methods and stand alone capabilities. What happens to the system if a key server with messages waiting to be picked up goes off-line? How does the sending station know that they must resend that message because it is temporarily lost? What happens if a hurricane hits Florida and a Meteor hits the server? How long will it take to replace the server and come back online? What resources are we (The ARRL and ARES) ready to put forward to make this a 24/7 99.999% up time system that is a total outage time of 5.25 Minutes in 1 year, 99.99% is 52.56 minutes. This will become mission critical to ARES and the ARRL.

The Current product of choice by the ARESCOM committee has the following disclaimer:

"The WINLINK 2000 system and its participating stations strive to be available 24 hours a day, seven days a week. However, because of the voluntary nature of those providing the service, timely delivery of data from the WINLINK 2000 system may not always be available due to down times, system failures, loss of Internet access or for any other reason, and, therefore, is not guaranteed as to timeliness or content."

This is not to pick on this product specifically, it is simply used as a design concern for any system chosen by the ARRL.

3. Customers use of the digital system:
One of the major selling points brought forward is that every person in the EMA office can use their own email client to send and receive messages. It is a simple technical solution for an IT person to setup a second account on their client so they can send mail. However, in reality after dealing with thousands of users at a university, only about 2% of the users out there will understand this. The other 98% will become frustrated and hateful of the system as they forget to send messages the “right way”.

When you look at the pictures in QST, who is sitting at the computers using WINLINK? Hams. So this selling point of a system is not valid today, maybe in a few years it will be when the Generation of non-technology people move out of our customer base. Therefore with HAMS at the keyboard does it matter which product we use? My customers just want me to deliver the message. If they wanted to deliver the message, they will not call me in to help. Additionally as Information Technology security gets tighter and tighter, it will come down to we will not be able to use the Client Machines for email through a Ham based digital system.

I do not see customers using the system as a selling point. I for one do not like the idea of 3rd party operations of someone attaching a JPG that puts my license in jeopardy. We can talk the talk but can be block the send key? Explaining the rules is our job as is done very nicely. But will the user obey the rules? It is my or your license at stake and if the FCC enforces the rules, it is you or I that gets in trouble. Not the sender of the message.

4. Documentation:
A new digital system has to work much like current software technologies. “Here is our product,” “Here is how to install it,” “Here is how to use it,” and then finally “Here is the technical details of how it works.” For fast deployment to the entire field we have to provide simple how to documents in simple concise single locations. Not several sections of documents spread over several very technical documents. This has been the down fall of most digital systems in Ham Radio. Some people just want to use it and make it work. Not spend hours reading through documents.

5. Bandwidth:
Several strides have been made in the area of bandwidth and speed of transmissions. This is an obvious problem with a digital system at our limited rates. In the course of a major event, time wasted (on the air and at the station) sending an image by packet verses SSTV today is a problem. As the technology and system improves this will probably go away, but today this is a concern.

6. Nationwide Frequency Plan:
As this goes live some form of Frequency coordination will need to done. It is conceivable that a band opening could cause local traffic to mess with a remote location that could care less. It isn’t that the messages will be routed, it is that the air ways will be clutter and collisions could delay messages.

Implementation concerns:

1. Section Plans:
When I look at a digital system for the Indiana Section, I think about how I can get my entire section up on pure RF - No Internet service available anywhere. My “last mile” of coverage is 36,291 square miles (Indiana's geographical area). I have to assume the Internet is failed in a disaster or will soon fail.

2. Local Plans:
When I have been looking for a solution with local groups a simple point to point network of TNCs running a piece of software on an ad hoc frequency is a quick and simple way of setting up a Digital network. This can be achieved a number of ways but a single county could require a large number of stations. In Vigo County alone we have 2 Hospitals, the Red Cross, EOC, Various Shelters and other locations through out the county. All of which could have a digital link requirement. This is just one county of 92.

3. Cost of implementation of a digital system:
The Cost to walk in cold to a site and setup any digital communications network will not be cheap. There is the fact that you would potentially need an HF and UHF station (Radio, TNCs and Antennas) at each EOC. Not to mention the Computer. Depending on the software requirements Windows 2000 or XP may been needed which means that the machine needs to be pretty robust to make the OS run and potentially run all the components. So if I were to go out and buy all new equipment to build this up it is estimated about $5000 per location. Not counting any annual fees for Internet access points, equipment insurance and tower space.

In Indiana there are 92 counties, 1 EOC each, some with 2 or 3, plus one at the state level. So for math purposes lets say we have 100. If we use a system that requires setups like above and buy all new, we are looking at $500,000 in equipment. Yes it can be argued that this is over kill but it is not in emergency preparedness, every county and site should have a full stand-alone system so that if everything else fails they can still function. This is analogous to, does only one fire truck carry all the hoses? No, they all have some hoses on them so they can do what they need to do. Some have more hoses to share but all have some for stand alone operations.

Is the ARRL ready to help write the grants for a $500,000 in equipment for one section? Seems to me that the ARRL should consider helping the ARES groups get Liability Insurance and Non-for-profit Incorporation status if we are go to this proposed system and have to write our own grants. If the ARRL requires it, shouldn't the equipment belong to the ARRL? In Indiana you have to pay property taxes on every piece of business equipment, I don't know how this is going to go over. Therefore we have consider what this cost is going to do to the ham community. Many of us are running on shoe string budget, what ever I can scrap up for equipment etc.

My Final Thoughts for this Letter

One of the major features of ham radio is that is essentially several hundred hobbies within one major hobby title. This feature of having diversity is apparent in all parts of our lives, from the car you drive, your favorite mode of communications, types of antennas, to the manufacturer of radios. However, one must understand when a diverse group is told that they will use one package on one Vendor's OS. There will be resistance, we have gone from promoting diversity to forcing compliance.

The initial operation of the proposed ARESCOM findings is one package, WINLINK, whether it was the only one reviewed or not, it is perceived that way by many. The ARRL must already begin to consider moving to the next level. In that they control the look, the feel and the open standard of how it works. I think by moving to an open standard with guidelines there will be less resistance, and development for LINUX , Mac OS and other systems can be developed. WINLINK.org can remain the primary lead, but open the standards up so anyone one can use any machine they choose. I can put Linux on a box a lot cheaper than WIN XP.

One of the initial points of WINLINK was that it uses the internet. This statement in and of itself was perceived by many hams as "stupid." The truth the matter is that the early releases relied heavily on the internet, and as current and future releases come along it is evolving to not be so reliant on the internet. Yet when we look back at Ham Radio how many Igates are running on APRS, Echolink or MSYS BBS systems on the internet? Leveraging the internet to our advantage is good but hinging on it is bad. Perhaps this wasn't marketed right. By the way, what happened to the big WiFi push a couple of years ago?

One of the most unfortunate issues that came of the entire ARESCOM report was a polarization of people. Not necessarily over technical issues but the way some presented themselves as 'We are WINLINK, prepare to be assimilated.' This burnt a number bridges for a lot of people. Additionally the ARESCOM group seemed almost a covert operation, yes it was publicized but wasn't really heard from until they announced their findings. I have received a survey for

information on existing digital systems and have passed it on to people in my section with the information, but shouldn't that have happened first not after the report? This survey will now be perceived as that the data will be used to simply support the WINLINK system choice and not evaluate systems. Perhaps if this was done upfront and then the report came out the reaction would have been less. It is perceived by many as the ARRL has decided and now they are selling it. This entire process needs to be revaluated as some point by the ARRL to avoid such issues in the future.

Just as some of my previous comments were not necessarily in line, we could banter this around all year long. While my written word does not necessarily support it, especially my first letter, I am trying to remain objective about this entire project.

73

David L. Pifer - N9YNF
Indiana Section Emergency Coordinator
6083 N. Clinton St.
Terre Haute, IN 47805-1507
Home: (812) 466-1005 Work: (812) 237-2923
n9ynf@arrl.net http://www.pifer.us/david/

http://www.arrl.org http://www.inarrl.org