

ARES Operations during a Widespread Internet Outage

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January 22, 2012

Introduction

All of us and the agencies we serve have become increasingly dependent on the Internet. We have developed a number of workarounds for localized Internet outages but what we would do in a total Internet outage requires some thinking and strategy shifts. The purpose of this document is to start a conversation on this topic. I'd appreciate additional ideas from others as you think about this topic and will incorporate those in this paper.

About the Internet

The Internet grew out of earlier government sponsored information exchanges that were designed to survive a nuclear war. The Internet is a complex mesh of many diverse pathways and is quite robust as a whole. We have developed tools, such as Winlink, that are quite effective at bridging beyond local failures as have our agencies. Satellite setups, for example, are a great alternative connection during a local outage. The overall Internet has been so reliable and is so useful that it seems almost unthinkable that it could go away. However, increasingly sophisticated and aggressive cyber warfare techniques pose a real threat to power plants and other infrastructure on the net. Attacks could cripple military networks and other computer systems. This sort of thing is happening today in small, probing attacks that would be much worse in a 21st century shooting war. Because of this, it is possible that our own government might be forced to shut things down across the county.

Implications of a total loss of the Internet

The Internet is so pervasively used that it is difficult to comprehend the extent of the effects. Of course, regular email and our browsers would be off-line. Most cell towers are connected to networks via Internet links so cell phones would likely have problems. Many radio and TV feeds would be interrupted. Things we take for granted like weather reports would be seriously impaired. Logistics for all sorts of commerce including food distribution would be affected. Suddenly much additional communications would be needed and what communications we are used to would be seriously degraded.

Strategies for ARES

Activation:

Many of us make good use of email and text messages to activate our members. This is a good practice since SMS messages will often get through when other communications are overloaded but will be of no use in even a local outage. Plans should have provisions for this. Most plans call for members to check

in on designated repeaters in an emergency and that provides a path. As members are gathered, individuals can be sent out to collect others by making calls on other repeaters and liaisons can be established with other surrounding groups. IRLP, Echolink and internet D-Star links will all be useless. Wide area networks should be established and regularly tested as preparation for such an event. Member rosters will be unavailable on-line. Members should keep rosters, plans and other information needed for activations in printed copies or on thumb drives – in an outage, these will be unavailable. Key members can be found by dispatching someone to their address as a last resort.

Since our agencies will not be able to reach us by normal means, we will have to dispatch representatives to agency locations to link up for possible assistance. We will have to be proactive in doing so.

Voice Links:

Wide area voice nets without internet dependencies and liaisons for local nets would be critical. Assigning liaison stations to monitor HF plan frequencies would also be critical. All sorts of traffic would have an increased dependency on voice net coordination in a total Internet outage. NTS Traffic nets are another asset for passing traffic that can be utilized – especially for messages outside of Texas. We would use higher HF frequencies (like 20M) to establish national voice links.

Digital Traffic:

Our agencies will especially need help with routing forms and emails. The Winlink system has great flexibility but many parts of the system would become inoperative. Local RMS Packet servers not running RMS Relay will refuse traffic. The same goes for RMS PACTOR and RMS WINMOR servers.

For RMS Packet, consider having at least one station in your area set up with RMS Relay. This can be done with RMS Relay running but not selected in RMS Packet until needed if you want to insure mail does not get stranded at that station when other alternatives exist. Enabling RMS Relay at one station during an outage can allow at least local emails to be exchanged. Use caution installing RMS Relay on multiple stations in an area to avoid mail getting stored at multiple locations. Care will need to be taken with traffic for outside the area.

RMS PACTOR has a little known provision to also utilize RMS Relay as an internet backup. Using RMS Relay with RMS PACTOR is normally a VERY BAD IDEA! If the Internet is available at other station, we would NOT want stations dropping off mail and having it stuck at an RMS PACTOR without the Internet. In a total Internet outage, things are different. I would plan on switching the N5TW RMS PACTOR station over to RMS Relay during a total outage. I run 3 RMS Packet stations also on RMS Relay that can be hit over at least an 11 county area that would be tied into the same database. The State Operation Center would be able to access traffic via this setup. Since this would become a critical resource, keeping messages small would be imperative. I would bring on a second RMS PACTOR station using another radio to add bandwidth to the system. An upper band to take traffic from outside the area might be added if that became important. Other stations running RMS Relay around the state that are equipped with HF forwarding would be able to route traffic for users to others using this as a central hub

or this could be done with traffic from one of the Winlink PACTOR client programs like Airmail or RMS Express. Other locations running RMS PACTOR could also be configured with RMS Relay but this would have to be done with close coordination to avoid stranding mail. I need to confirm if RMS WINMOR can be so configured.

Airmail and RMS Express can both send and receive traffic point to point. Point to point traffic is tricky since both stations need to be setup for it and be on the same frequency. Voice nets could be used to coordinate this traffic. Other digital modes, such as MT-63, that have the capability to be heard by multiple stations (as opposed to ARQ modes that connect two stations) could be used to run digital only nets to send traffic and coordinate point to point connections as well. My notion is that the voice net coordination approach would be more effective without a great deal of practice and stations on-line. Sticking with WINLINK has the advantage of using the tools we need to already have and have error retry to keep messages error free.

Portable digital stations or agency equipped ones will be especially important. In some cases, it may be necessary to print out messages or save them to USB drives for hand delivery. Logging messages and tracking delivery will take on added importance.

Conclusion

A total internet outage has become less unthinkable with serious cyber warfare threats. Such an outage will be extremely disruptive to our society and will create a great need for emergency communications. While our own capabilities will be degraded by an internet shutdown, with planning and preparation we can be of great service to our agencies. We plan an internet free spring exercise to test these capabilities. Let me ask each of you to give some thought on how we can best prepare and operate in this scenario!