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4/17/08
NET 260
Project

IRLP VoIP Implementation

This short little expert which can easily be mistaken for a short research topic will include informational details on a Voice over IP type of implementation, called IRLP that was performed strictly for Amateur Radio use with aid from a Linux operating system.

IRLP stands for Internet Radio Linking Project. This project was created by David Cameron (VE7LTD) in Canada. Although Dave did not construct the principles of VoIP, he used VoIP ideas to create an Amateur Radio type of communication system through the internet. To do such a task, Dave experimented with another buddy Michael Illingby (VE7FD) and created a connection between Vancouver and Vernon, BC. By just talking on a handheld unit, similar to the look of a walkie-talkie, the two stations were able to communicate to each other as if they were just standing next to each other. The success of their project escalated into a total of 1,530 nodes as of April 17, 2008 at 12:56PM EST around the entire globe (Cameron).

To create a system to make this work, a node owner with an Amateur Radio License would have to spend time and money to construct a simple system. A few key features to make all of this happen include: having a Linux machine, a logic board from the company to interface the computer and radio, a radio, and an internet connection with a few ports open (Cameron).

After the physical components have been constructed, the node operator would then install a flavor of Linux. IRLP used to recommend Fedora, but has recently switched to Centos. By the aid of instructions in a PDF format, even a first time Linux user can easily install the operating system as well as the IRLP script (Cameron).

After installation, the node is then tested by using a testing reflector 9990. In the scripts created by the IRLP team, each station is assigned a four digit node number which will be statically assigned for the entire lifetime of the node. To connect to the station, a remote user can just dial the DMTF number on a radio or the node operator can connect to the remote station by a “decode” command. In this command, the node operator will log into the machine as “repeater” and type “decode 9990”. The IRLP system will initiate a connection to the other node in only a few steps. The originating node will contact the IRLP status server and find out the details of the remote node. This will tell the originating node the IP address of the remote node as well as if the remote node is busy. This process uses the TCP protocol and requires acknowledgements. The second step is to connect to a remote node by using the IP address requested from the IRLP status server and attempt to connect directly to the remote node. This process uses TCP for connection details and UDP for audio traffic. After the node is connected, the test server can finally be used to test audio levels. The test server will record the transmissions and play them back so the audio levels can be adjusted. After there are no more problems with audio levels and connectivity, the node can be put on the air and registered into the IRLP database for other people to find and use (Cameron).

Tada! A VoIP system has successfully been implemented for Amateur Radio use by using Linux!

As an actual project, this system has successfully been installed on Fedora Core 5 for about one year and during spring break, the system was reinstalled on Ubuntu. To install this on Ubuntu, install scripts were found online (<http://rob.pectol.com/irlp/content/view/15/32/>) by an IRLP user for other node operators to use. His scripts also had another nice feature which included the ability to use another VoIP system called Echolink. Echolink is like VoIP except it

has the ability for an Amateur Radio operator to use a single computer with a headset to communicate to other RF nodes or other computer users (Pectol).

My particular IRLP node is 4683 and the status can be found at <http://status.irlp.net/IRLPnodedetail.php?nodeid=4683> or the IRLP page on my HAM radio website, <http://KC2LPU.AJoiner.net/irlp.html>. Additionally, by using Google Earth, the status of the entire IRLP system can be mapped out with help from a KML file from the IRLP website <http://irlp.net/google.html>.

To conclude, IRLP is used by many Amateur Radio operators. Even the novice computer user is able to install a system on the dreaded Linux machine. By implementing a VoIP system for HAM radio, friends around the planet can easily communicate to each other as if they were in the same town.

Works Cited

Cameron, Dave and Michael Illingby. IRLP - Internet Radio Linking Project. 17 4 2008
<<http://irlp.net>>.

Pectol, Rob. Robert Pectol's IRLP Projects Website - IRLP on Ubuntu Linux. 17 4 2008
<<http://rob.pectol.com/irlp/content/view/15/32/>>.