BridgeCom SYSTEMS

How to link over 45 repeater sites with Motorola's IP-Site Connect using BridgeCom Systems' TL-NET^{TM} MV Product series.

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INTRODUCTION/PROBLEM

Now more than ever, school districts covering large areas are seeing the necessity of providing reliable communications during times of emergency. Baldwin County School District located in Baldwin County, Alabama, consists of 45 campuses covering over 2000 square miles. The school district had three major requirements for a seamless digital communication solution. First, the district required the ability to place district wide emergency and announcement calls. In addition, all emergency calls are to be patched through to the local law enforcement's communication system. Secondly, district officials required all radio users to be able to send and receive district wide voice and text alerts. Thirdly, the system required GPS tracking for school buses in addition to voice and text communications. The solution had to be seamless, private, cost effective, and reliable.

CES, Team One Communications, Inc based out of Mobile, AL was awarded the bid to provide the solution to Baldwin County. Team One partnered with BridgeCom Systems to assist in the site linking capability. Team One is an authorized Motorola Channel Partner and BridgeCom Systems, Inc. is a third party application developer for the MOTOTRBO professional line of land mobile radio products.

SOLUTION

Reliably linking 45 school campuses with area wide voice communications poses several challenges. How to cover and penetrate each campus building while at the same cover 2000 square miles so that all mobile and fixed units can hear emergency calls?

In order to build a reliable system and meet the three system requirements, Team One utilized Motorola's MOTOTRBO IP-Site Connect digital site linking solution. To cover each school campus, one MOTOTRBO repeater was installed on each campus. Coverage for the school buses was achieved by installing one MOTOTRBO repeater at three different tower sites located around the county. Each repeater was linked via IP. Before all 45 sites can be linked, the 15-peer limit inherent to MOTOTRBO IP-Site Connect needed to be overcome. To overcome this problem, Team One chose BridgeCom Systems TL-NET MV-IPSC1 site linking product. TL-NET makes IP-Site Connect infinitely scalable to the point where any number of repeater sites can be linked via IP.

As seen in Figure 1, Baldwin County was divided into eight zones. Each zone consisted of one repeater for each school campus, and one MV-IPSC1. Each zone's MV-IPSC1 managed all the repeaters in that zone and was linked via IP to the centrally located TL-NET server. The TL-NET Server is the heart of the system and manages all zone-to-zone call routing according to predetermined call maps.
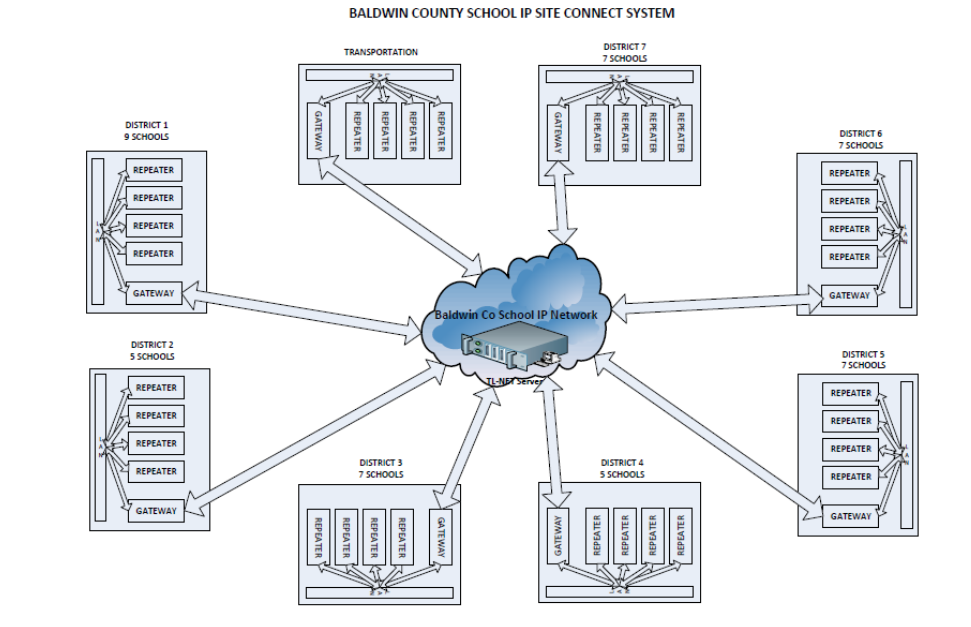

Figure 1

Figure 2 depicts call routing for local and wide area. Each MOTOTRBO repeater can handle two communication talk paths at one time. Each talk path is called a slot. The slots operate independent of each other. Slot 1 is dedicated to wide-area coverage where district wide announcements and emergency calls take place. Slot 2 is dedicated to local calling within the respective zone.
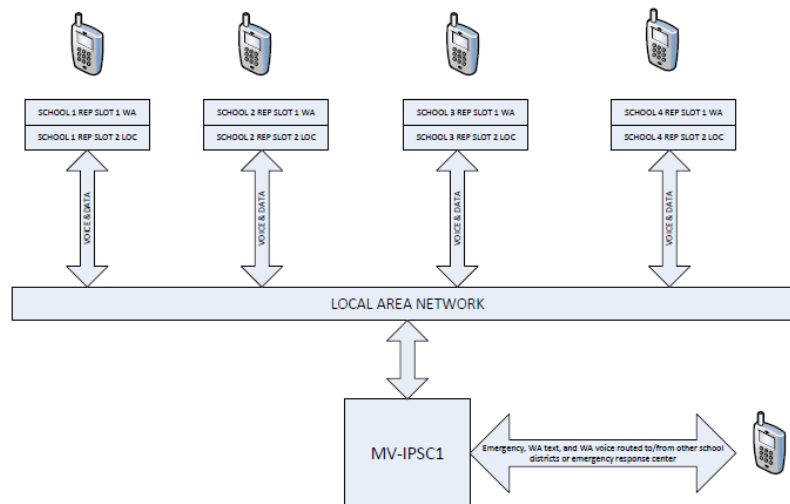

Figure 2

TL-NET BENEFITS

By using the MV-IPSC1, additional enhancements are afforded to IP-Site connect. Creative call mapping techniques provided by the TL-NET system allow district administrators the ability to place local repeater calls, intra-zone calls, and wide area district calls. Wide area district calls include announcements, text messages, and emergency calls. The possibilities are vast. For example, when school personnel talk on his/her local talk group, the communications would stay local to that school using repeater Slot 2. When he/she talks on the wide-area talk group, the system would utilize IP-Site Connect and the MV-IPSC1 to route communications over the Baldwin County School IP Network repeater Slot 1. What this means is that private talk groups can be created for school administrators, maintenance, admin, and teachers. Members of these private talk groups can then place calls over the wide-area talk path to as many zones as defined by the talk map.

At the same time, emergency calling is improved. When radio users press their emergency button, voice and text information is sent district wide. This allows for school officials and emergency responders to know who the call came from and the zone/school campus from which it originated.

Bus communication is also enhanced by the MV-IPSC1. Bus radios can be programmed to roam onto the various 45 networked repeaters. This allows for voice, text, and vehicle location information from the buses to be sent across the network back to the admin office.

TL-NET supports a web-based interface. This gives system operators the ability to monitor the system from any network connected web browser. Several IP diagnostic tools are available to IP-Site Connect. Network status can be continuously monitored. The integrity of each IP link is graphed depicting latency and loss rates. See Figure 3. Link failure can trigger the system to email alerts to system operators. In addition, real time call activity, air time and call logging, and bandwidth usage of the sites can be viewed. Also, there is provision for a backup TL-NET server in the event system redundancy is required. In the case of Baldwin County, the primary and secondary servers were installed in two different locations within the district.
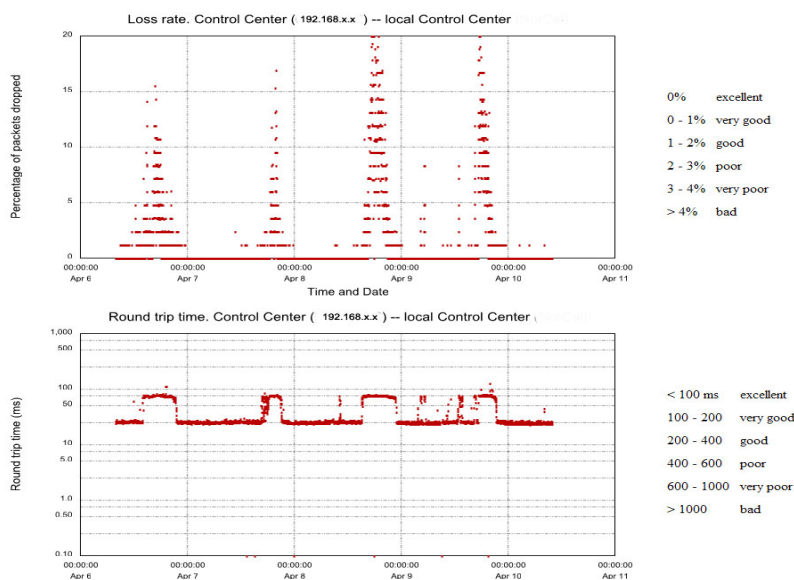

Figure 3

SUMMARY:

By using BridgeCom System's TL-NET MV-IPSC1, Baldwin County School District was able to link 45 MOTOTRBO repeaters creating a 2 channel wide-area communication system.   All school personnel can now place local calls and text messages as well as district wide emergency and announcement calls. At the same time, the school bus system is now wide-area linked. Buses are able to roam onto the various local systems and stay connected on the wide area system. The buses can be tracked and drivers are always linked to the district office. System operators and district officials now have a flexible system they can monitor and expand as the district grows. The result is a reliable, seamless, private, and cost effective communication solution.