

Apex monitoring for Motorola Radio System

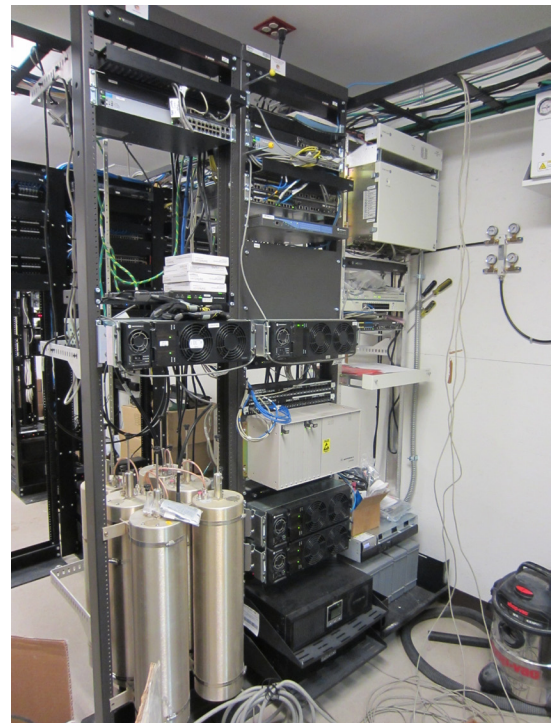
Scenario

A Colorado consortium of Clear Creek County Sheriff's Office, Gilpin County Sheriff's Office, the City of Black Hawk Police and Evergreen Fire Rescue operate a Motorola GTR8000 multi-channel VHF radio system. The consortium required the implementation of an alarm and monitor system to monitor their radio system network, and the security, health and operation of nine remote tower sites. System status and alarm information are to be monitored and viewed at four dispatch centers, and alert management and maintenance personnel. The monitoring system is completely separate from the Motorola multi-channel, multi-site analog conventional VHF IP simulcast network. There was also a requirement to access and configure existing equipment remotely. The equipment to be monitored include site intrusion, electrical power, emergency generator operation, UPS status, HVAC status, microwave radio function and VHF radio operation. Current network security protocols must be employed to prevent unauthorized access to the system.

TASC Systems' Solution

TASC Systems implemented a Network Management System (NMS) based on our Apex platform and siteRSM remote site monitoring devices for all 13 sites. A standalone Ethernet network was installed for TASC Systems' alarm and monitoring system. A siteRSM was installed at each site to monitor the digital and analog output from site devices that do not have Ethernet connections for SNMP. These devices consist of various makes of Kohler, Generac and Cummins generators, fuel levels and automatic transfer switches, AC power, GTR8000 forward power, Motorola MLC8000 VGU failure, antenna, TRAK GPSs, Alcatel microwaves, RFS dehydrators, and Bard HVAC systems. The equipment is monitored through SNMP traps includes: Adtran multiplexers, Eltek power plant, Eaton UPSs, TRAK GPSs and Xtreme UPSs.

Sensors are installed to provide enclosure monitoring. AC power sensors are used to measure commercial power. Temperature sensor is used to measure enclosure temperature. Door contact sensor is used to monitor door entry. Single direction RF power monitors along with direct connection to PTT, are used to measure transmit power for every Motorola GTR8000. Also single direction RF power monitors is used to measure reflected power at every antenna. The microwave system T1's are used to backhaul the data from the tower sites to a Windows server computer running Apex. Two sites required communication to the siteRSM through a transparent serial connection using the Alcatel MDR890000 or MDS LEDR900S. A Rad Rici network terminal unit and a network switch are installed at



each of the sites.

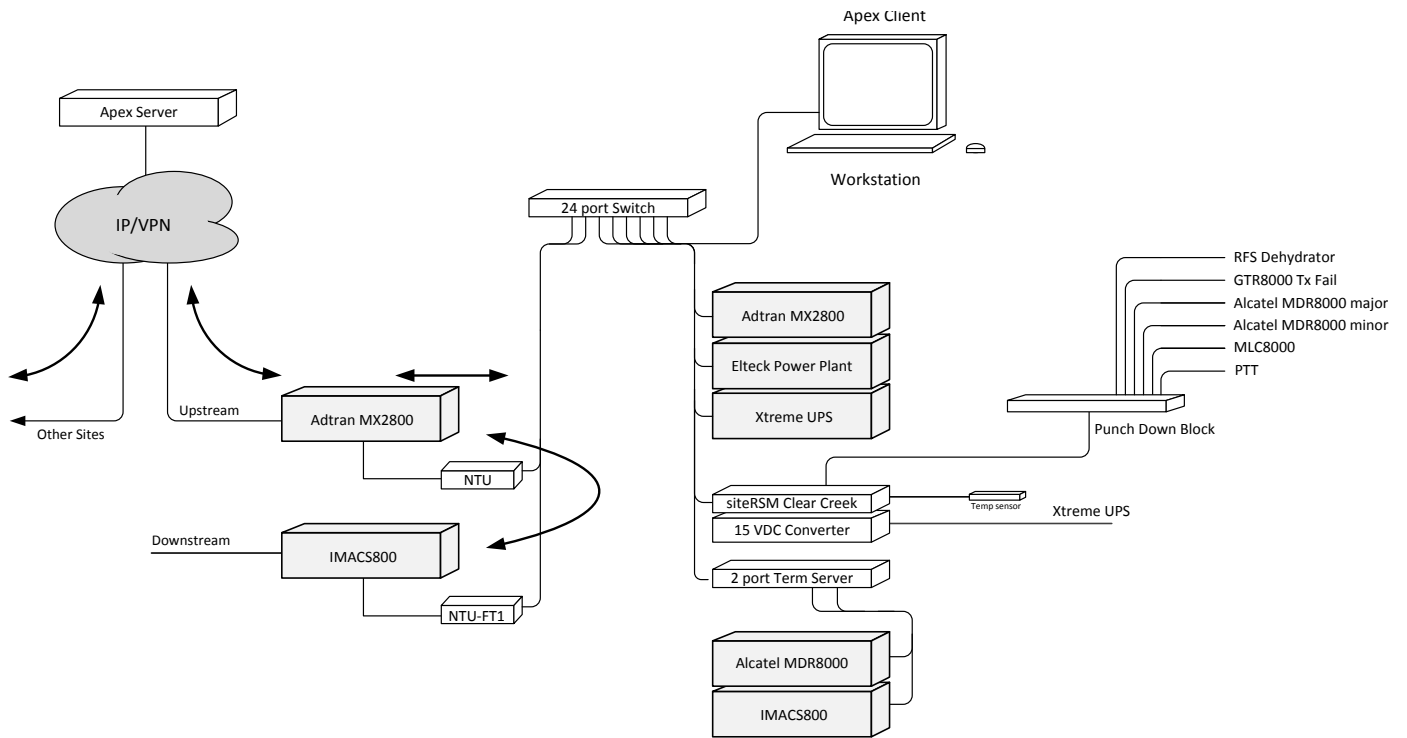
Terminal servers allow remote configuration of equipment with serial connectors. Management information base (MIB) files are obtained for any devices with support of SNMP, so that trap information can be displayed and configured for alarms, directly into Apex. Apex Mobile allow users to view the status of I/O, acknowledge or clear siteRSM alarms and actuate outputs from a smart phone or tablet.

Results

Real-time visibility for all the sites is important to the consortium. Failure information from Apex history log files has been used to help provide additional time sequence information during site outages. Alarm details are used to provide information about what tools and equipment to carry when travelling to a far away remote site. With an engineer onsite, configuration of the microwave at a nearby site can be provided remotely. Temperature alarms were able to provide information about site HVAC issues, especially when the season changes.

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Site Diagram



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