

Monitoring and Managing Microwave Sites

Service providers are continually upgrading and expanding their infrastructure to increase the network speed and capacity or add additional functionality for customers. While upgrading and expanding is critical to success, it also creates challenges for monitoring and managing their network sites.

Many service providers are deploying or considering deployment of LTE services (4G). To accommodate these higher speeds, Ethernet backhaul is often deployed to remote sites, sometimes using new Ethernet-capable microwave radio systems. However, legacy TDM microwave radios are also common and can remain vital for many years. It is important for a service provider to have access to monitor and manage all of these microwave sites effectively and efficiently.

The Kentrox solution including Optima and Remote enables service providers to remotely monitor microwave sites and manage critical site elements. This includes performance and fault management, alarm monitoring, and configuration management for microwave radios from any vendor (for example, Alcatel-Lucent, Aviat, NEC, and Motorola – contact Kentrox for a complete list of supported radios).

Optima provides complete visibility and control of network infrastructure sites, such as cell sites, substations, and remote communication huts. It gives immediate operational cost reductions for organizations that need to access, monitor, and manage large numbers of sites. The Remote product family provides IP management to remote sites and equipment. Remote provides site alarm monitoring, protocol conversion, and equipment connectivity and acts as an intelligent extension of your Operations Support Systems (OSS).

Performance management

Proactively monitoring and managing the performance of microwave sites improves the efficiency and operation of network equipment, reducing site problems and network outages. The Remote from Kentrox collects performance data using SNMP and stores it for long-term trending and correlation.

The data collected from microwave radios includes several key performance indicators: received signal level (RSL), bit error rate (BER), frame errors, and key statistics for IP packets over the microwave radio link, such as cyclic redundancy check (CRC) errors, collisions, jabbers, undersized packets, oversized packets, and fragments. Other performance measurements that can be collected and analyzed using

Benefits of Microwave Site Management

- Provides comprehensive performance data and reporting to proactively identify problems
- Collects alarms in near real-time and notifies personnel of potential issues
- Provides remote access to manage microwave sites

The screenshot shows the 'Add Automatic Report Generation Rule' configuration page in the Kentrox Optima interface. The page has a navigation bar at the top with links like 'My Optima', 'Dashboards', 'Map View', 'Event List', 'Reports', 'System Configuration', 'Help', and 'Logout'. The main content area is titled 'Add Automatic Report Generation Rule' and includes a 'Print' button. Below the title, there is a note: 'Please make your changes and hit "Submit" when done.' The form contains several sections: 'Autogen rule name' with a text input field containing 'Battery Voltage 7 Day'; 'Time Intervals' with a dropdown menu set to 'Weekly'; 'Owner' with a dropdown menu set to 'admin'; 'Choose favorites' with a list of checkboxes and labels including 'Battery A Voltage 7 Day', 'Battery A+B Voltage 7 Day' (checked), 'Battery B Voltage 7 Day', 'Fuel Level Duration', and 'Fuel Tank events (all)'; 'Send separate email for every favorite' with a dropdown menu set to 'yes'; 'What to use to build attachment file name:' with a dropdown menu set to 'Report Title' and a checkbox for 'Exclude date from attachment file name'; 'Aggregation and display information:' with a dropdown menu set to 'CSV'; 'Comma separated email addresses:' with a text input field containing 'siteadmin@gmail.com'; 'Optima Users:' with a list of users including 'Dave Eichorn - dave_eichorn@kentrox.com'; 'Email Subject:' with a text input field containing '[autogen]' and a checkbox for 'Exclude the rule name from subject'; 'Email Body:' with a text input field containing 'Attached is your auto generated optima report.'; 'Priority:' with a dropdown menu set to '1'; and a 'Test Contacts' button. At the bottom of the form are 'Submit' and 'Cancel' buttons.

Optima automatic report generation example

Kentrox include transmit power (in dBm) and temperatures on both A (primary) and B (protection) sides.

Customer-configurable thresholds (including upper and lower bounds) can be defined for all performance management data. When a threshold is exceeded, the Kentrox Remote will immediately generate an alarm of the violation and notify the service provider based on user-defined notification rules.

Application Note



Optima dashboard displaying a microwave site's weekly RSL minimum, maximum, and average signal strength



Optima dashboard displaying weekly Receive Signal Level (RSL), transmit power, internal temperature, and current alarm status for a microwave site

Combining Remote and Optima, dashboards provide a comprehensive view of all microwave sites in the network. The customizable, web-based dashboards show performance data and allow operators to collect, store, present, and manage a combination of real-time and historical fault, performance, and configuration data without having to physically visit the remote site. Additionally, operations managers or directors can receive daily automated reports by email showing the top 10 worst performing microwave radios (for example RSL and BER) specifically for their respective area, helping identify issues for resolving them before an outage occurs.

Alarm monitoring and fault management

Detecting, isolating, and resolving problems on a microwave network before they occur can improve network quality and minimize downtime while reducing operating expenses, resulting in higher customer satisfaction. Kentrox enables service providers to monitor status and alarms of multiple microwave radios across a network. The Remote collects Critical, Major, Minor, and informational alarms in near real-time using SNMP. Other operational status of the radios, such as active radio (primary vs. protect), can also be collected. All microwave radio alarms are logged in Optima and displayed on a map and in an event list.

Optima automatically emails Critical and Major alarms nearly instantaneously to the designated personnel (customer-configurable) for additional research and resolution, ideally prior to an outage occurring. Reports can also be scheduled, such as having an email generated daily to an operations manager identifying all outstanding alarms at a designated time of day specific to their geographic region.

The Kentrox solution periodically polls the microwave radio to determine if it is unresponsive. If unresponsive, a Critical alarm is created and automatically sent to the designated personnel. This ensures that a complete outage of the microwave, such as a power loss or lightning strike, is also detected quickly.

Remote management

The Kentrox solution enables service providers to easily configure microwave radios remotely. Optima provides point and click navigation to the microwave radio for remote access and supports web-based configuration (HTTP) or the vendor's client software. As the provider adds new microwave radios in the network, they can quickly be configured in Optima for future monitoring and management.

Optima also provides activity logging. When a person remotely accesses a microwave radio, Optima logs a database entry that includes date and time, duration, user, site, and element name. The service provider then has the ability to create various reports on user activity.

Effective microwave site management

Monitoring and managing microwave cell sites, especially remotely, is critical to the success of many service providers. Using the Kentrox solution, preventive maintenance can be automated to ultimately avoid site outages. Required onsite maintenance can be scheduled and combined with other local site visits rather than dispatched on an emergency basis. Monitoring performance data can identify issues that may not normally be noticed and provide important data on site effectiveness. With enhanced alarm monitoring and fault management capabilities, Kentrox identifies and helps isolate issues at microwave sites, ultimately improving network performance and technician efficiencies.

For more information, visit www.kentrox.com, email info@kentrox.com or call 800 733 5511 or +1 614 798 2000.