

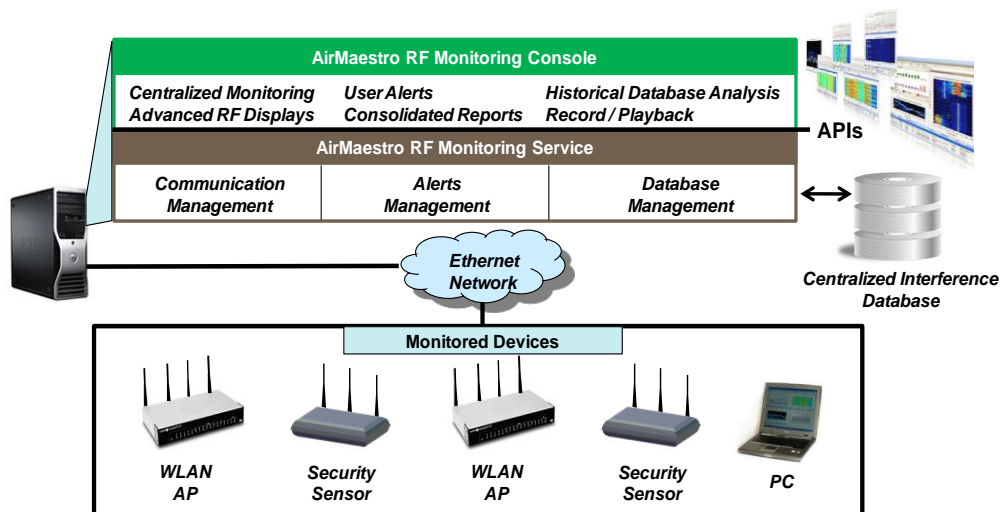
AirMaestro RF Monitoring Service

Centralized Monitoring of Radio-Frequency Interference from Multiple Devices to Improve WLAN Performance, Management and Security

The AirMaestro RF Monitoring Service provides comprehensive and centralized monitoring of the radio frequency (RF) environment for real-time management and investigation into historical interference events. Systems with embedded AirMaestro RF Signal Analyzers continuously scan all of the IEEE 802.11 channels in the 2.4 GHz and 5 GHz frequency bands for interference, classify the interference, and record the interference events in local event logs at the edge of the network. The network can make automatic adjustments to self-heal the interference issues affecting WLAN performance and record configuration changes in the event log. The RF Monitoring Service collects interference and event data from the remote systems and manages the information in a centralized database. The service and its database are accessible through APIs and the AirMaestro RF Monitoring Console applications, supporting easy integration with existing WLAN management systems.

Product Highlights:

- **Monitors and analyzes real-time, in-depth, radio-frequency interference across the network** of Monitored Devices, which are remote systems with embedded AirMaestro RF Signal Analyzers
- **Manages a centralized interference database for the network** based on event information collected from remote systems
- **Automatically generates alerts** when configurable events are detected or thresholds are exceeded
- **Enables access to advanced spectrum data and channel quality metrics** from AirMaestro RF Signal Analyzers embedded in remote systems
- **Manages communication to multiple remote systems**, including logical grouping of devices and automatic network discovery
- **Scales to accommodate growth and management needs**, supporting up to 2,000 simultaneous connections to Monitored Devices
- **Provides APIs for integration with WLAN performance monitoring and security monitoring systems**



Centralized Interference and Event Database Management

The AirMaestro RF Monitoring Service provides comprehensive and centralized monitoring of the RF environment for real-time management and investigation into historical interference events. Systems with embedded AirMaestro RF Signal Analyzers continuously scan all of the IEEE 802.11 channels in the 2.4 GHz and 5 GHz frequency bands for interference, classify the interference, and record the interference events in local event logs at the edge of the network. The network can make automatic adjustments to self-heal the interference issues affecting WLAN performance and record configuration changes in the event log. The RF Monitoring Service collects interference and event data from the remote systems and manages the information in a centralized database. The service and its database are accessible through APIs and the AirMaestro RF Monitoring Console applications, supporting easy integration with existing WLAN management systems.

The following events are captured and stored in the database:

- Interference Events
- Automatic and Intelligent Channel Selection (AICS) events
- Alert Events
- Connection Status Events

For interference events, the following information is captured for each interferer detected:

- Monitored Device ID that detected the interferer
- Interferer Type
- Interference Start Time, Stop Time and Duration
- Interference Active Indicator
- Center Frequency of Interference
- Minimum RSSI (Receive Signal Strength Indicator) of Interference
- Maximum RSSI of Interference
- Average RSSI of Interference
- List of WLAN channels impacted by interference

The RF Monitoring Service also provides automated database maintenance. The user can configure the number of days of event information is persistently stored in the database, providing flexibility on the amount of network storage required by the database. The user can also schedule the time of day and frequency of the automated database maintenance.

Advanced Alerting

The RF Monitoring Service performs continuous analysis of the interference and event database. Through the APIs, the user can instruct the service to generate alerts when user-configurable interference thresholds have been exceeded or specific events have been detected. Alerts can be configured to send notifications when connections to Monitored Devices go down, specific interferers are detected or if interference from non-802.11 devices exceeds certain thresholds. For example, it is useful for security purposes to set an alert for when a Wi-Fi Jammer has been detected which can disable all WLAN transmissions within range of the device.



Advanced Spectrum Displays

The RF monitoring console supports advanced spectrum displays for remote visibility into the RF environment for diagnostics and troubleshooting. This includes the ability to receive real-time RF spectral and channel quality data from Monitored Devices. Through the API interface, this data can be received and the following displays can be generated

- Consolidated Interference Log
- Persistence Graph
- Channel Quality Display
- Centralized Event Log
- Scrolling Spectrogram with interference classification overlays
- Channel Utilization Display (both WLAN and non-WLAN)
- Spectrum Analyzer

OEMs can develop their own displays or utilize the AirMaestro RF Monitoring Console applications. The AirMaestro advanced spectrum displays are available as Adobe® Flash® applications, allowing WLAN equipment manufacturers to easily integrate the RF Spectrum Analysis console displays with their existing WLAN management user interface.

Communication Management

The RF Monitoring Service centrally manages the communication with multiple remote systems with embedded AirMaestro RF Signal Analyzers, called Monitored Devices. When directed through APIs, the service establishes and manages connections to Monitored Devices over the Ethernet network. The service can support connections to up to 2,000 Monitored Devices simultaneously.

Logical Grouping of Monitored Devices

The RF Monitoring Service supports logical grouping of Monitored Devices, similar to a file folder structure. This allows the user to group Monitored Devices and query the database for interference information applicable only to a subset of the Monitored Devices. A useful grouping structure could be groups based on location, with sub-grouping to get more specific on the devices location. This would allow the user to view the aggregate database for the complete network and drill down to the specific interference history associated with a particular floor in a building.

Automatic Network Discovery

The RF Monitoring Service automatically discovers Monitored Devices on a TCP/IP network.

Connection License Management

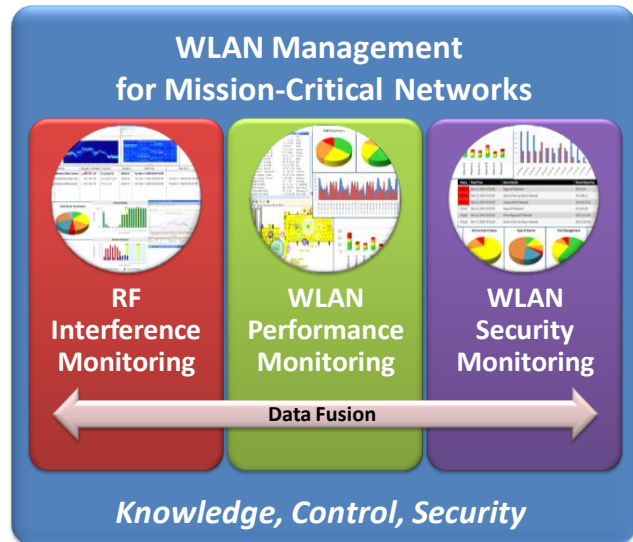
A connection license is required for the RF Monitoring Service to connect to and communicate with a Monitored Device. Through APIs, the user can install and manage the connection licenses for the Monitored Devices. Both perpetual and time-limited connection licenses are available to support different OEM business models.

Data Fusion Support for Advanced WLAN Management and Security

Data fusion is the merging of data from multiple independent sources to achieve a more complete and accurate understanding of the situation under study. The AirMaestro RF Monitoring Service supports data fusion with an Application Programming Interface (API) that provides equipment manufacturers the ability to integrate the AirMaestro RF Signal Analysis solution with other WLAN management applications.

Data fusion can be used in WLAN management to merge the centralized interference database with data sets from WLAN monitoring applications and WLAN Intrusion Detection Systems (IDS). Correlations can be made between specific types and profiles of RF Interference events with excessive transmit retries, excessive CRC errors, dropped connections, and slower network performance. This information can be used to make fact-based adjustments to the WLAN deployment, including location and removal of the sources of the interference, improved channel mapping for the WLAN access points, or repositioning of the WLAN access points away from interfering devices. Correlations can also be made between RF interference from malicious RF jammers and

Denial of Service attacks, enabling rapid understanding and reaction to the specific type of security threat. WLAN management requires fusing data from RF interference monitoring, WLAN performance monitoring and WLAN security monitoring in order to provide the knowledge, control and security necessary to support mission-critical wireless networks.



Supported Operating Systems

Windows XP (SP3), Windows XP Professional (SP3), Windows Vista (SP1), Windows Server 2003 and 2008, Windows 7, Linux 2.4 and Linux 2.6

System Requirements

Minimum CPU Speed: Intel Pentium® series processor running at 1 GHz or faster

Memory: 1GB

Free disk space per Monitored Device: Under typical conditions, 500 kBytes of disk space is required per month of recorded interference and event information. 13.5 Mbytes of disk space is required for one hour of FFT/spectral data per sensor.

Related Products

This section lists the other related products from Bandspeed.

Part Number	Description
BSP2500	AirMaestro BSP2500 RF Signal Analyzer Integrated Circuit
BSP2500-MPCI	AirMaestro BSP2500 RF Signal Analyzer Mini PCI Card
BSP-RFMS-CL-1	Connection license to RF Monitoring Service supporting one sensor
BSP-RFMS-CL-10	Connection license to RF Monitoring Service supporting up to 10 sensors

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