

# Cisco Mobile Wireless Fault Mediator R3.0

## Introduction

The Cisco Mobile Wireless Fault Mediator (MWFM) is part of the CiscoWorks2000 for Mobile Wireless bundle (See Figure 1) which is a suite of element manager software (EMS) applications that enhances the delivery of new mobile wireless services. Based on CiscoWorks2000, it addresses the element management requirements of mobile operators and provides fault, configuration, accounting, performance, and security (FCAPS) functionality as mobile operators transition their wireless service delivery networks from second-generation (2G) circuit-based traffic to 2.5G and third-generation (3G) IP-based services.

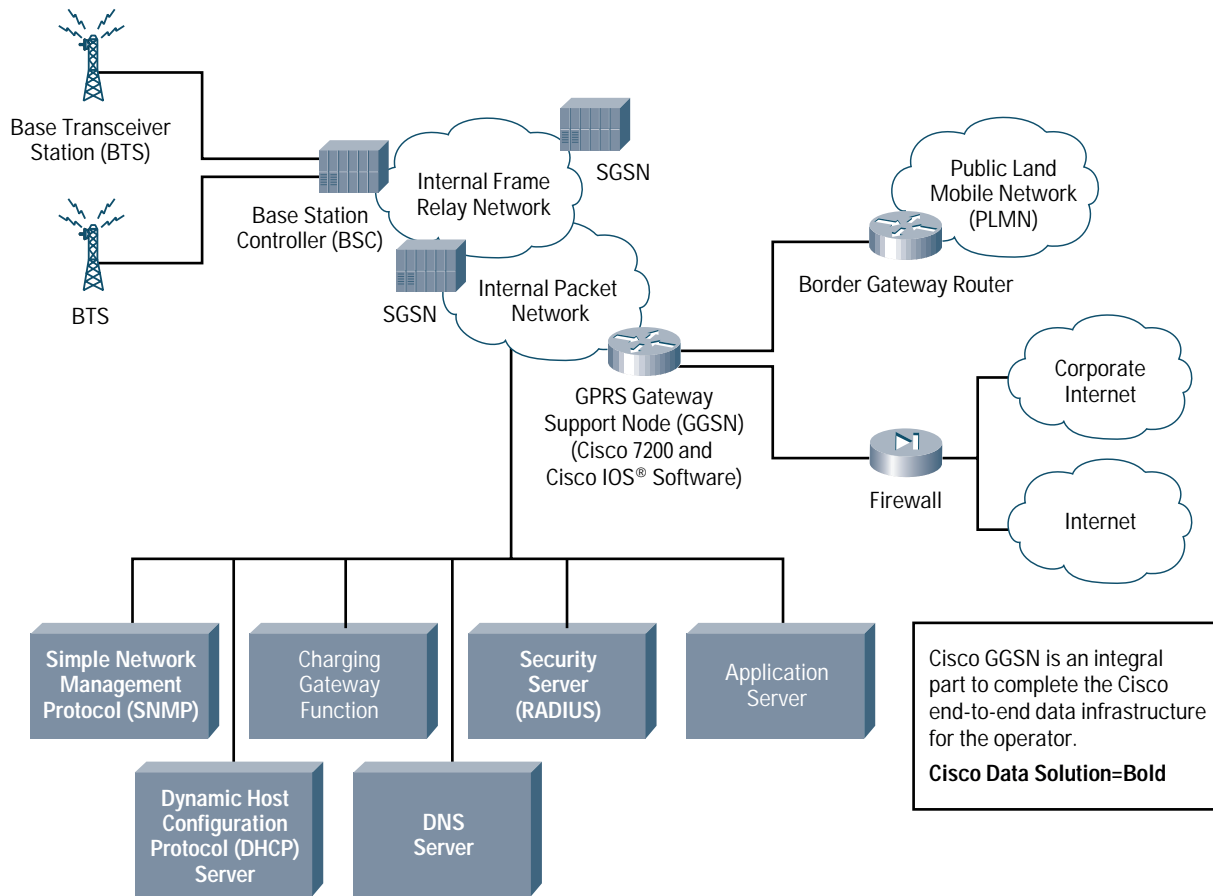
A typical GPRS network is represented in Figure 2, where the Cisco GPRS solution enables mobile operators to provide packet data service to their wireless subscribers.

In this context, MWFM is a feature-rich device layer solution that provides alarm filtering and correlation of Cisco wireless support nodes such as the Cisco Mobile Wireless Router or the Cisco PDSNs/GGSNs and their neighboring Catalyst<sup>®</sup> switches. MWFM uses complex mathematics to solve the change-monitoring problem, allowing network-management products such as Fault Manager of Manager (MoM) to support networks that are experiencing the phenomenal growth imposed by the boom in mobile Internet traffic.

Figure 1  
CiscoWorks2000 for Mobile Wireless Package



Figure 2  
Mobile Wireless Architecture Map—GPRS Network



## Features

The Cisco MWFM R2.2 architecture is based on RiverSoft NMOS and RiverSoft Fault Manager technologies, adapted to the Cisco mobile wireless environment.

## Discovery and Topology

The Cisco MWFM discovery engine finds all Cisco mobile wireless nodes, such as PDSN, GGSN or MWR1900 and any Cisco Catalyst switches attached to the IP network, capturing not only what is present, but also the port-to-port connectivity between devices on the network. This information is stored in a database designed to allow rapid storage, retrieval, and updating of data concerning connectivity between devices.

Cisco MWFM consistently provides an accurate map of the network. Even as the network changes, ongoing passive discovery detects when new Cisco mobile wireless devices are added and triggers a partial rediscovery of that portion of the network.

## Policy-Based Management

Cisco MWFM uses a policy-based management system where all aspects of the network are controlled and administered from a single point. This approach relies on active object classes (AOCs) to monitor network elements and define polling requirements. AOCs describe how to identify devices, determine connectivity, and monitor the devices for problems.

Cisco MWFM can perform aggregated polling, which consolidates polling requests for multiple applications, thereby minimizing the unnecessary use of network and device bandwidth. To further minimize unnecessary polling, Cisco MWFM uses caching technology to store the most recent device information. Standard polling methods include ping and Simple Network Management Protocol (SNMP). Cisco MWFM monitoring also accepts SNMP traps and reads device syslog files.

### Application Support

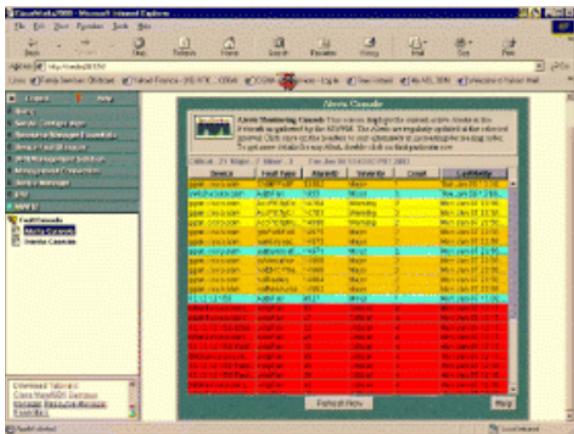
For many service providers, the migration toward mobile Internet networks creates a unique management problem. Large investments in legacy systems must be leveraged while continuing the migration toward IP environments. In these mixed environments, the issue becomes how to transparently manage the mix of technologies while continuing to deliver the highest level of service availability. The flexible and open nature of Cisco MWFM provides off-the-shelf integration with popular Fault MoM, such as Cisco Info Center or HP OpenView.

### A New Foundation

Designed as an application system of CiscoWorks2000 Mobile Wireless networks, Cisco MWFM is uniquely capable of serving as the central fault monitoring component at the element management layer for Cisco GPRS, CDMA and mobile services solutions. For administrators, this means less time spent writing rules and building intelligence into the network management system and significant gains in network availability.

Figure 3 provides an example of the Cisco MWFM R3.0 alarm console interface.

Figure 3  
Cisco MWFM Alarm Console Graphical User Interface



### Cisco MWFM Features and Benefits Matrix

Table 1 describes the benefits mobile service providers can enjoy when the Cisco MWFM is deployed as part of their element manager software (EMS) infrastructure.

Table 1 Features and Benefits of the Cisco MWFM Feature

	Description	Benefits
<b>Auto-discovery</b>	<ul style="list-style-type: none"> <li>Automatically discovers Cisco mobile wireless device network connections and changes, while monitoring element status, including neighboring Cisco Catalyst switches</li> </ul>	<ul style="list-style-type: none"> <li>Provides a near real-time model of the Cisco wireless network</li> <li>Eliminates manual update of network inventory</li> </ul>

Table 1 Features and Benefits of the Cisco MWFM Feature

	Description	Benefits
<b>Complex alarm gathering mechanism</b>	<ul style="list-style-type: none"> <li>• SNMP traps</li> <li>• Management Information Base (MIB) threshold violation</li> <li>• Internet Control Message Protocol (ICMP) polling</li> <li>• Syslog messages</li> </ul>	<ul style="list-style-type: none"> <li>• No additional configuration needed in the device</li> <li>• Monitors key metrics in a preventive fashion and alerts network management system (NMS) before condition negatively impacts the network performance</li> <li>• Ensures that devices are available</li> </ul>
<b>Multiple NMS support</b>	<ul style="list-style-type: none"> <li>• Alarms can be forwarded to multiple NMSs based on user-defined attributes</li> </ul>	<ul style="list-style-type: none"> <li>• Allows a flexible integration with the ISP's network operations center (NOC) architecture</li> </ul>
<b>Robust transport trap mechanism</b>	<ul style="list-style-type: none"> <li>• New trap field with unique and sequential ID number</li> </ul>	<ul style="list-style-type: none"> <li>• Enables legacy operations support system (OSS) to retrieve any missed alarms</li> </ul>
<b>Alarm filtering</b>	<ul style="list-style-type: none"> <li>• Alarms can be filtered by alarm severity, device type, or alarm field</li> </ul>	<ul style="list-style-type: none"> <li>• Empowers users to receive only the alarms that interest them and hide the remaining ones from view</li> </ul>
<b>Correlation</b>	<ul style="list-style-type: none"> <li>• Alarm de-duplication</li> <li>• Reachability and device-level correlation, including Hot Standby Routing Protocol (HSRP) support</li> </ul>	<ul style="list-style-type: none"> <li>• Prevents users from being overflowed, particularly during alarm storms</li> <li>• Provides the probable root cause of alarms to the user, eliminating the guesswork of troubleshooting network outage</li> </ul>
<b>Integration with Cisco OSS and Fault MoM</b>	<ul style="list-style-type: none"> <li>• Powerful query mechanism provides a synchronization facility with legacy OSS</li> <li>• Standard Java API interface, and automates configuration and alarm synchronization between MWFM and OSS</li> </ul>	<ul style="list-style-type: none"> <li>• In case of missed alarms or OSS crashing, users can retrieve list of all active alarms via a Java API synchronization mechanism</li> </ul>
<b>CiscoWorks2000-based graphical user interface (GUI)</b>	<ul style="list-style-type: none"> <li>• User-friendly GUI that displays active alarm view window; operators can double-click on a row for a detailed view of trap</li> </ul>	<ul style="list-style-type: none"> <li>• Significantly reduces time to deployment with off-the-shelf GUI</li> </ul>
<b>Active Object Class (AOC) Policy Manager</b>	<ul style="list-style-type: none"> <li>• Configuration GUI that allow user to define rule sets</li> </ul>	<ul style="list-style-type: none"> <li>• Removes the complexity of modifying default correlation rules with a graphical interface</li> </ul>
<b>Enhanced configuration tool</b>	<ul style="list-style-type: none"> <li>• Operators define discovery scope and other network parameters intuitively with new configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Eliminates installation configuration complexity and accelerates the time to monitor the network so downtime can be minimized</li> </ul>
<b>Heartbeat</b>	<ul style="list-style-type: none"> <li>• GUI and Java API tool to indicate health of the different MWFM processes</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an early warning system so technical support team can proactively troubleshoot MWFM</li> </ul>
<b>Trap Multiplexer Mechanism</b>	<ul style="list-style-type: none"> <li>• Operators can set MWFM to forward, as is, all traps received from the devices to the NMS</li> </ul>	<ul style="list-style-type: none"> <li>• Operators can choose to analyze device alarms without the correlation applied</li> </ul>
<b>Standards compliant</b>	<ul style="list-style-type: none"> <li>• SNMP V1 traps</li> </ul>	<ul style="list-style-type: none"> <li>• MWFM traps are forwarded to OSS based on SNMP standard</li> </ul>

## Specifications

### Supported Platforms

The Cisco Mobile Wireless Fault Mediator supports the following platforms:

- Cisco GGSN R.1.4/3.0/4.0
- Cisco PDSN R1.0.x/1.1/1.2

- Cisco Catalyst 5500 and 6500 switches
- Cisco MWR1900
- Cisco Mobile Exchange

#### **Predefined Correlation Rules**

- Alarm de-duplication
- Root-alarm determination
- GGSN Correlation Rules
- PDSN Correlation Rules
- MWR1900 Correlation Rules
- Cisco Mobile Exchange Correlation Rules

#### **Compliance**

- SNMP v1 trap format
- X.733 alarm severity Format

### System Requirements

#### **Sun Solaris Server Minimum Requirements**

The server system requirements can be found in the product overview documents for the CiscoWorks2000 for Mobile Wireless solution. Please refer to these and other product installation documentation for more detailed information on setting up and configuring these solutions.

### Service and Support

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### Ordering Information

Cisco Mobile Wireless Fault Mediator is sold as an integral part of the CiscoWorks2000 for Mobile Wireless solution.

To place an order, contact your local Cisco sales representative.

Additional Information:

For more information about Cisco mobile wireless products and solutions, please go to <http://www.cisco.com/go/mobile>.

### For More Information

To learn more about Cisco mobile wireless products and solutions, please go to <http://www.cisco.com/go/mobile>



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