



## Voice Faults and Exceptions

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A fault is an abnormal condition that occurs when a system or a system component violates a performance threshold or is not functioning properly. An exception is a group of related faults.

VHM groups related faults into a single exception. That is, it generates a single exception of a given type per device, regardless of the number of faults that exist.

The following topics are discussed:

- [Overview of Faults and Exceptions, page 3-1](#)
- [Media Server Faults, page 3-3](#)
- [ICS 7750 Faults, page 3-8](#)
- [Voice Gateway and Inline Power Switch Faults, page 3-10](#)

## Overview of Faults and Exceptions

By polling SNMP MIBs and subscribing to voice-related events received by DFM, VHM obtains event information to analyze, and generates faults for voice-enabled devices.

Users can review a summary of faults on the Real-Time Dashboard (see the [“Using the Real-Time Dashboard” section on page 2-1](#)) and view the generated alarms on the Monitoring Console (see the [“Using the Monitoring Console” section on page 2-14](#)).

For additional overview information, see the following topics:

- [Device Types that Generate Faults, page 3-2](#)
- [Contents of the Fault Tables, page 3-2](#)

## Device Types that Generate Faults

VHM generates faults for the voice device groups that comprise the following types of voice-enabled devices:

- Voice Clusters.
- Media Servers.
- ICS 7750.
- Voice Gateways—VHM obtains some of the event information for voice gateways from DFM.
- Inline Power Switches—VHM obtains some of the event information for Inline Power Switches from DFM.

## Contents of the Fault Tables

Fault tables include the following types of information:

- Managed entity type where faults can be detected.
- Faults that are detected.
- User-configurable thresholds that are used to define the tolerance limits of each fault condition.
- Exceptions raised by VHM when a fault condition exceeds thresholds.

# Media Server Faults

Table 3-1 lists the media server faults diagnosed by VHM.

**Table 3-1 Media Server Faults**

| Managed Entity                 | Faults   | Thresholds  | Notification           |
|--------------------------------|--|---|------------------------|
| Media Convergence Server (MCS) | <ul style="list-style-type: none"> <li>Unreachable</li> <li>SNMP Agent Not Responding</li> </ul>   |   | Operational exception  |
|                                | <ul style="list-style-type: none"> <li>High CPU Utilization</li> <li>Low Free Disk Space</li> <li>Insufficient Free Physical Memory</li> <li>Insufficient Free Virtual Memory</li> </ul> | ProcessUtilitizationThreshold<br>FreeHardDiskThreshold<br>FreePhysicalMemoryThreshold<br>FreeVirtualMemoryThreshold | Resource exception     |
|                                | <ul style="list-style-type: none"> <li>System Temperature High</li> <li>System Fan State Down</li> <li>CPU Fan Status Down</li> </ul>  | TemperatureCelsiusThreshold   | Temperature exception  |
|                                | <ul style="list-style-type: none"> <li>Power Supply Status Down</li> <li>Power Supply Status Degraded</li> </ul>   |   | Power supply exception |
| Interface                      | Interface Down   |   | Operational exception  |
| Voice Cluster                  | Too Many Inactive Phones   | InActivePhoneThreshold  | Operational exception  |

Table 3-1 Media Server Faults (continued)

| Managed Entity   | Faults  | Thresholds                     | Notification                        |
|--|---|--------------------------------|-------------------------------------|
| Application<br>(Cisco CallManager,<br>Workflow<br>Application,<br>Database Server,<br>Conference Bridge,<br>TFTP Server) | Application Down  |                                | Application<br>exception            |
| CallManager  | <ul style="list-style-type: none"> <li>• Synthetic Phone Registration Failed</li> <li>• Synthetic Off Hook Transaction Failed</li> <li>• Synthetic Empty Call Failed</li> <li>• Synthetic End to End Call Failed</li> <li>• Synthetic TFTP Download Failed</li> <li>• Synthetic Phone to Gateway Call Failed</li> <li>• Synthetic Phone to Bridge Call Failed</li> <li>• Synthetic Transaction Server Down</li> </ul> |                                | Application<br>monitor<br>exception |
| Remote Insight Board<br>(RIB)  | <ul style="list-style-type: none"> <li>• RIB Battery Status Down</li> <li>• RIB Battery Status Degraded</li> <li>• RIB Battery Charge Status Down</li> </ul>  | BatteryPercentChargedThreshold | Power<br>supply<br>exception        |

**Table 3-1 Media Server Faults (continued)**

| Managed Entity | Faults                       | Thresholds             | Notification                  |
|----------------|------------------------------|------------------------|-------------------------------|
| Voice Services | Synthetic Transaction Failed |                        | Application monitor exception |
| Voice Cluster  | Too many inactive phones     | InActivePhoneThreshold | Operational exception         |

Media server faults are described in more detail, grouped by notification type:

- [Operational Exceptions, page 3-5](#)
- [Resource Exceptions, page 3-6](#)
- [Temperature Exceptions, page 3-6](#)
- [Power Supply Exceptions, page 3-7](#)
- [Application Exceptions, page 3-7](#)
- [Application Monitor Exceptions, page 3-7](#)

### Operational Exceptions

VHM generates an operational exception for multiple occurrences of the following faults (for a complete list of media server faults, see [Table 3-1](#)):

- **Unreachable**—The device is unreachable from the DFM server.
- **SNMP Agent Not Responding**—The device is not responding to SNMP requests. ICMP pings are OK, but SNMP requests are timed out.
- **Interface Down**—The interface is nonoperational.
- **Too Many InActive phones**—The percentage of inactive phones on a CCM exceeds the InActivePhoneThreshold value.

### Resource Exceptions

VHM generates a resource exception for multiple occurrences of the following faults (for a complete list of media server faults, see [Table 3-1](#)):

- **High CPU Utilization**—The processor utilization exceeds the processor utilization threshold. `ProcessUtilizationThreshold` defines the upper limit for CPU utilization and is expressed as a percentage of total CPU capacity.
- **Insufficient Free Disk Space**—The free disk space is less than the low free disk space threshold (`FreeHardDiskThreshold`).
- **Insufficient Free Physical Memory**—The system is running out of memory resources, and the threshold value is less than the `FreePhysicalMemoryThreshold` value.
- **Insufficient Free Virtual Memory**—The system is running out of virtual memory resources, and the threshold value is less than the `FreeVirtualMemoryThreshold` value.

### Temperature Exceptions

VHM generates a temperature exception for multiple occurrences of the following faults (for a complete list of media server faults, see [Table 3-1](#)):

- **System Temperature Server Down/Degraded**—The temperature sensor is reporting abnormal temperature measurements. Possible conditions are OK, Degraded, and Failed.
- **Temperature High**—The operating temperature is higher than the threshold.
- **System Fan State Down/Degraded**—The system fan condition is not normal. The possible conditions are OK, Degraded, and Failed.
- **CPU Fan Status Down/Degraded**—The CPU fan condition is not normal. The possible conditions are OK, Degraded, and Failed.

### Power Supply Exceptions

VHM generates a power supply exception for multiple occurrences of the following faults (for a complete list of media server faults, see [Table 3-1](#)):

- **System Battery State is Down/Degraded**—Remote Insight Board battery status is not normal. It is either Degrading or Failed.
- **RIB Battery Status Down/Degraded**—Remote Insight Board battery charge is not normal. It is either Degrading or Failed.
- **RIB Battery Charge Status Down/Degraded**—Remote Insight Board battery charge (for MCS-7830 with RIB card) is not normal. It is degrading or failed.
- **Power Supply State Down/Degraded**—The power supply is not in a normal state. The possible states are OK, Degraded, and Failed.

### Application Exceptions

VHM generates an application exception for multiple occurrences of the following fault (for a complete list of media server faults, see [Table 3-1](#)):

- **Application Down**—Application is not running.

### Application Monitor Exceptions

VHM generates an application exception for multiple occurrences of the following fault (for a complete list of media server faults, see [Table 3-1](#)):

- **Synthetic Phone Registration Failed**—Phone registration test failed during a synthetic transaction for a Cisco CallManager (CCM).
- **Synthetic Off Hook Transaction Failed**—Off-hook test failed during a synthetic transaction for a CCM.
- **Synthetic Empty Call Failed**—Empty call test failed during a synthetic transaction for a CCM.
- **Synthetic End to End Call Failed**—End-to-end call test failed during a synthetic transaction for a CCM.
- **Synthetic TFTP Download Failed**—TFTP download test failed during a synthetic transaction for a CCM.
- **Synthetic Phone to Gateway Call Failed**—No device picked up a test call to a gateway during a synthetic transaction for a CCM.

- **Synthetic Phone to Bridge Call Failed**—No device picked up a test call to a conference bridge during a synthetic transaction for a CCM.
- **Synthetic Transaction Server Down**—The synthetic transaction server is down. Synthetic transaction tests are not being run.

## ICS 7750 Faults

Table 3-2 lists the ICS 7750 faults diagnosed by VHM.

**Table 3-2 ICS 7750 Faults**

| Managed Entity                            | Faults  | Thresholds  | Notification           |
|---|---|---|------------------------|
| ICS 7750                                  | Unresponsive  |   | Operational exception  |
|   | Power Supply Down   |   | Power supply exception |
| Primary SPE/Secondary SPE/Application SPE | CallManager Down  |   | Application exception  |
|   | <ul style="list-style-type: none"> <li>• Insufficient Free Disk Space</li> <li>• Insufficient Free Physical Memory</li> <li>• Insufficient Free Virtual Memory</li> </ul> | Free Hard Disk Threshold<br>Free Virtual Memory Threshold | Resource exception     |
|   | Power Supply State Down   |   |                        |
|   | Interface Operationally Down  |   | Operational exception  |
|   | Unresponsive  |   |                        |
|   |   |   |                        |

Table 3-2 ICS 7750 Faults (continued)

| Managed Entity                     | Faults  | Thresholds   | Notification          |
|------------------------------------|---|--|-----------------------|
| Multiservice Route Processor (MRP) | <ul style="list-style-type: none"> <li>High Utilization</li> <li>Unresponsive</li> <li>Insufficient Free Physical Memory</li> </ul> | ProcessUtilizationThreshold<br>FreePhysicalMemoryThreshold | Resource exception    |
|                                    | Interface Operationally Down  |  | Operational exception |
| System Switch Processor            | <ul style="list-style-type: none"> <li>High Utilization</li> <li>Insufficient Free Memory</li> <li>Unresponsive</li> </ul>          | ProcessUtilizationThreshold<br>FreePhysicalMemoryThreshold |                       |

ICS 7750 faults are described in more detail, grouped by notification type, in the following:

- [Operational Exceptions, page 3-9](#)
- [Resource Exceptions, page 3-10](#)
- [Power Supply Exceptions, page 3-10](#)
- [Application Exceptions, page 3-10](#)

### Operational Exceptions

VHM generates an operational exception for multiple occurrences of the following faults (for a complete list of ICS 7750 faults, see [Table 3-2](#)):

- Unresponsive**—If one of the ICS 7750 entities (for example, the media server, trunk card, or BPS) is down, a fault is generated.
- Interface Operationally Down**—Status of Interface is down.

### Resource Exceptions

VHM generates a resource exception for multiple occurrences of the following faults (for a complete list of ICS 7750 faults, see [Table 3-2](#)):

- **High Utilization**—The processor utilization exceeds the processor utilization threshold. `ProcessUtilizationThreshold` defines the upper limit for CPU utilization and is expressed as a percentage of total CPU capacity.
- **Insufficient Free Disk Space**—The free disk space is less than the low free disk space threshold (`FreeHardDiskThreshold`).
- **Insufficient Free Physical Memory**—The system is running out of memory resources, and the threshold value is less than `FreePhysicalMemoryThreshold`.
- **Insufficient Free Virtual Memory**—The system is running out of virtual memory resources, and the threshold value is less than `FreeVirtualMemoryThreshold`.

### Power Supply Exceptions

VHM generates a power supply exception for multiple occurrences of the following faults (for a complete list of ICS 7750 faults, see [Table 3-2](#)):

- **Power Supply State Down/Degraded**—The power supply is not in a normal state. The possible states are OK, Degraded, and Failed.

### Application Exceptions

VHM generates an application exception for multiple occurrences of the following fault (for a complete list of ICS 7750 faults, see [Table 3-2](#)):

- **CallManager Down**—Application is not running.

## Voice Gateway and Inline Power Switch Faults

[Table 3-3](#) displays the Voice Gateway and Inline Power Switch Faults diagnosed by DFM and further processed by VHM.

**Table 3-3 Voice Gateway and Inline Power Switch Faults**

| Managed Entities                     | Faults   | Thresholds   | Notification           |
|--------------------------------------|--|--|------------------------|
| Skinny Voice Gateway                 | Interface Operationally Down   |  | Operational exception  |
|                                      | Lost Contact with CallManager  |  | Connectivity exception |
| Voice Gateway<br>Inline Power Switch | <ul style="list-style-type: none"> <li>Unresponsive</li> <li>SNMP Agent Unresponsive</li> <li>Voice Port Operationally Down</li> <li>Interface Operationally Down</li> </ul> |  | Operational exception  |
|                                      | <ul style="list-style-type: none"> <li>Voice Port Administratively Down</li> <li>Interface Administratively Down</li> </ul>  |  |                        |
|                                      | <ul style="list-style-type: none"> <li>High Utilization (CPU)</li> <li>Insufficient Free Memory</li> </ul>   | ProcessUtilizationThreshold<br>FreePhysicalMemoryThreshold | Resource exception     |
|                                      | <ul style="list-style-type: none"> <li>Temperature Sensor Degraded</li> <li>Temperature Sensor Down</li> <li>Fan Down</li> <li>Fan Degraded</li> </ul>                       |  | Temperature exception  |
|                                      | <ul style="list-style-type: none"> <li>Power Supply Degraded</li> <li>Power Supply Down</li> </ul>   |  | Power supply exception |
|                                      |  |  |                        |

Voice Gateway and Inline Power Switch faults are described in more detail, grouped by notification type, in the following:

- [Operational Exceptions, page 3-12](#)
- [Resource Exceptions, page 3-12](#)
- [Temperature Exceptions, page 3-13](#)
- [Power Supply Exceptions, page 3-13](#)
- [Connectivity Exceptions, page 3-13](#)

### Operational Exceptions

VHM generates an operational exception for multiple occurrences of the following faults (for a complete list of Voice Gateway and Inline Power Switch faults, see [Table 3-3](#)):

- **Unresponsive**—The device is not reachable. The ICMP pings sent by the VHM server timed out without responding.
- **SNMP Agent Unresponsive**—The device is not responding to SNMP requests. ICMP pings are OK, but SNMP requests are timed out.
- **Interface Operationally Down**—A voice interface is down.
- **Interface Administratively Down**—A voice interface is down.
- **Voice Port Operationally Down**—A voice port is down.
- **Voice Port Administratively Down**—A voice port is down.

### Resource Exceptions

VHM generates a resource exception for multiple occurrences of the following faults (for a complete list of Voice Gateway and Inline Power Switch faults, see [Table 3-3](#)):

- **High Utilization**—The processor utilization exceeds the CPU utilization threshold. `ProcessUtilizationThreshold` defines the upper limit for CPU utilization and is expressed as a percentage of total CPU capacity.
- **Insufficient Free Memory**—The system is running out of memory resources and the threshold value is less than the `FreePhysicalMemoryThreshold` value.

### Temperature Exceptions

VHM generates a temperature exception for multiple occurrences of the following faults (for a complete list of Voice Gateway and Inline Power Switch faults, see [Table 3-3](#)):

- **Temperature Sensor Degraded**—The temperature sensor condition is Degraded.
- **Temperature Sensor Down**—The temperature sensor condition is Failed.
- **Fan Degraded**—The fan condition is Degraded.
- **Fan Down**—The fan condition is Failed.

### Power Supply Exceptions

VHM generates a power supply exception for multiple occurrences of the following faults (for a complete list of Voice Gateway and Inline Power Switch faults, see [Table 3-3](#)):

- **Power Supply Degraded**—The power supply is not in a normal state. The state is Degraded.
- **Power Supply Down**—The power supply is not in a normal state. The state is Down.

### Connectivity Exceptions

VHM generates a connectivity exception for multiple occurrences of the following fault (for a complete list of Voice Gateway and Inline Power Switch faults, see [Table 3-3](#)):

- **Lost Contact with CallManager**—Skinny Voice Interface lost contact with CCM.

