Monitoring Cisco UCS Manager

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

The **Cisco Unified Computing System** (UCS) is a data center computing solution composed of computing hardware, virtualization software, switching fabric, and management software. The idea behind the system is to reduce total cost of ownership and improve scalability by integrating the different components into a cohesive platform that can be managed as a single unit. Just-In-Time deployment of resources and 1:N redundancy are also possible with a system of this type.

Figure 1.1 depicts the architecture of Cisco UCS.

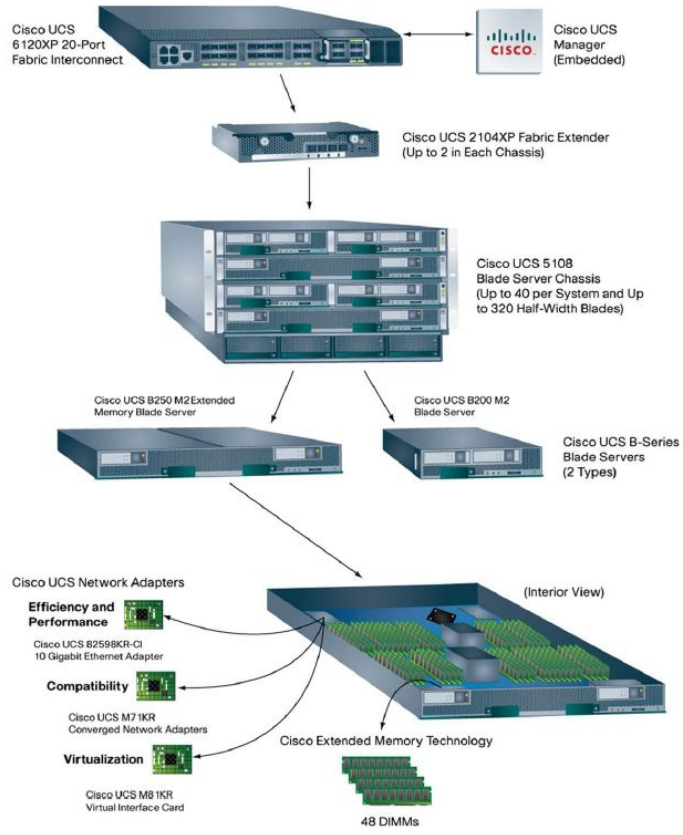

Figure 1.1: The architecture of the Cisco UCS

The computing component of the UCS is available in two versions; the B-Series (a modular package consisting of a powered chassis and full or half slot blade servers), and the C-series rackmount servers (that can be used with or without UCS, or mixed with blade UCS systems). Both form factors utilize the same standard components seen throughout the industry, including Intel Nehalem processors and DIMM memory. The servers are distinctive for supporting Converged Network

Adapters (CNAs), Port Virtualization, and in some models the Catalina chipset (ASICs that expand the number of memory sockets than can be connected to a single memory bus).

Besides the blade servers and chassis, the other core components of the Cisco UCS are as follows:

1. **UCS manager:** Cisco UCS Manager implements policy-based management of the server and network resources. Network, storage, and server administrators all create service profiles, allowing the manager to configure the servers, adapters, and fabric extenders and appropriate isolation, quality of service (QoS), and uplink connectivity. It also provides APIs for integration with existing data center systems management tools. An XML interface allows the system to be monitored or configured by upper-level systems management tools.
2. **UCS fabric interconnect**: Networking and management for attached blades and chassis with 10 GigE and FCoE. All attached blades are part of a single management domain. Deployed in redundant pairs, the 20-port and the 40-port offer centralized management with Cisco UCS Manager software and virtual machine optimized services with the support for VN-Link.
3. **Cisco Fabric Manager**: manages storage networking across all Cisco SAN and unified fabrics with control of FC and FCoE. Offers unified discovery of all Cisco Data Center 3.0 devices aa well as task automation and reporting. Enables IT to optimize for the quality-of-service (QoS) levels, performance monitoring, federated reporting, troubleshooting tools, discovery and configuration automation.
4. **Fabric extenders**: connect the fabric to the blade server enclosure, with 10 Gigabit Ethernet connections and simplifying diagnostics, cabling, and management. The fabric extender is similar to a distributed line card and also manages the chassis environment (the power supply, fans and blades) so separate chassis management modules are not required. Each UCS chassis can support up to two fabric extenders for redundancy.

The health of the Cisco UCS platform hence largely relies on how the blade chassis, the blade servers, the fabric interconnects and extenders are functioning. This implies that issues in the availablity / operability of one/more of these components, or the unexpected power/thermal/voltage failures they may encounter can degrade the overall performance of the Cisco UCS. In order to avoid this, the health and operational efficiency of the integral components of the platform should be continuously monitored, and issues proactively reported. This can be easily achieved using eG Enterprise.

Chapter 2: How to Monitor Cisco UCS Manager Using eG Enterprise?

The eG Enterprise is capable of monitoring the Cisco UCS Manager in an *agentless* manner.

2.1 Managing the Cisco UCS Manager

The eG Enterprise cannot automatically discover the Cisco UCS Manager. This implies that you need to manually add the component for monitoring. Remember that the eG Enterprise automatically manages the components that are added manually. To add a Cisco UCS Manager, do the following:

1. Log into the eG administrative interface.
2. Follow the Components -> Add/Modify menu sequence in the **Infrastructure** tile of the **Admin** menu.
3. In the **COMPONENT** page that appears next, select *Cisco UCS Manager* as the **Component type**. Then, click the **Add New Component** button. This will invoke Figure 2.1.

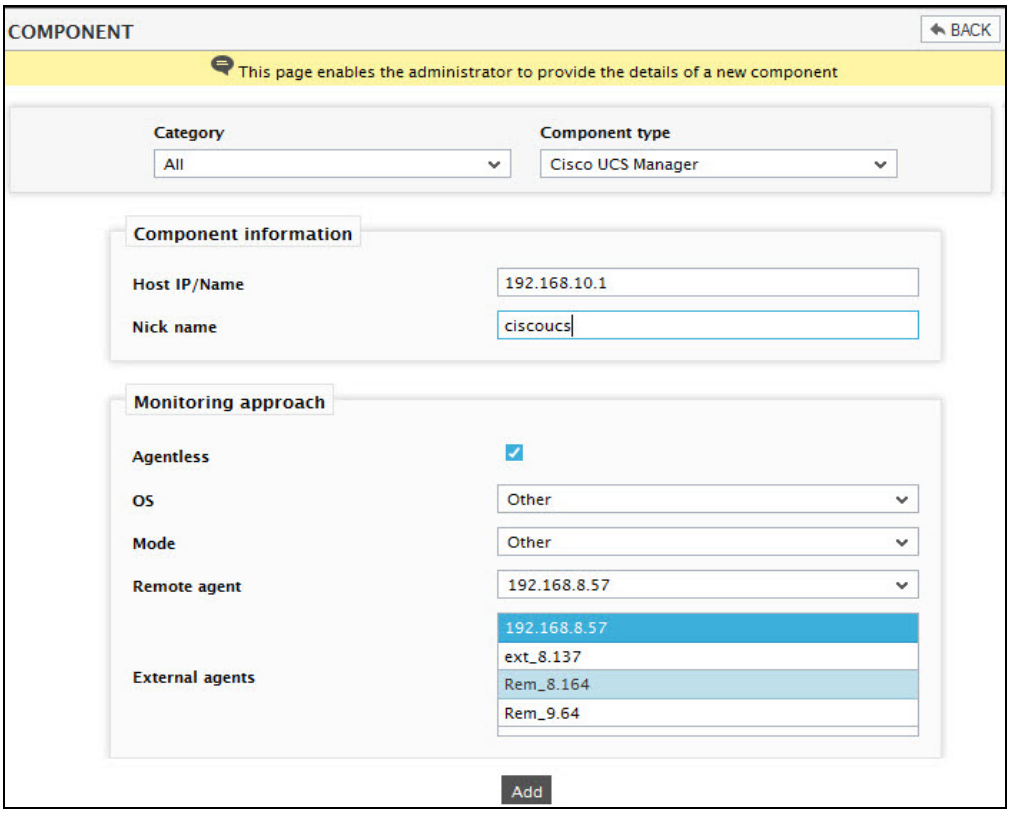

Figure 2.1: Adding a Cisco UCS Manager

4. Specify the **Host IP/Name** and **Nick name** of the Cisco UCS Manager. By default, the Cisco UCS Manager can be monitored in an Agentless manner only. So, while adding a new component, set the **OS** and **Mode** parameters to **Other**.Then click on the **Add** button to add the Cisco UCS Manager component.
5. When you attempt to sign out, a list of unconfigured tests as shown in Figure 2.2 appears.

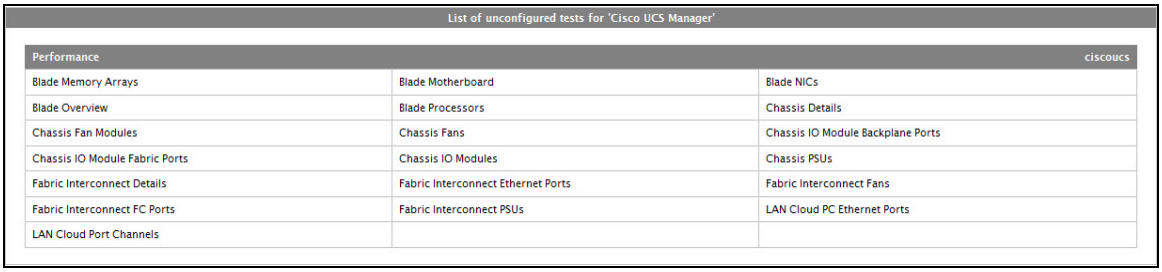

Figure 2.2: List of tests to be configured for Cisco UCS Manager

6. Click on any test in the list of unconfigured test. For instance, click on the **Chassis Fans** test to configure it. In the page that appears, specify the parameters as shown in Figure 2.3.

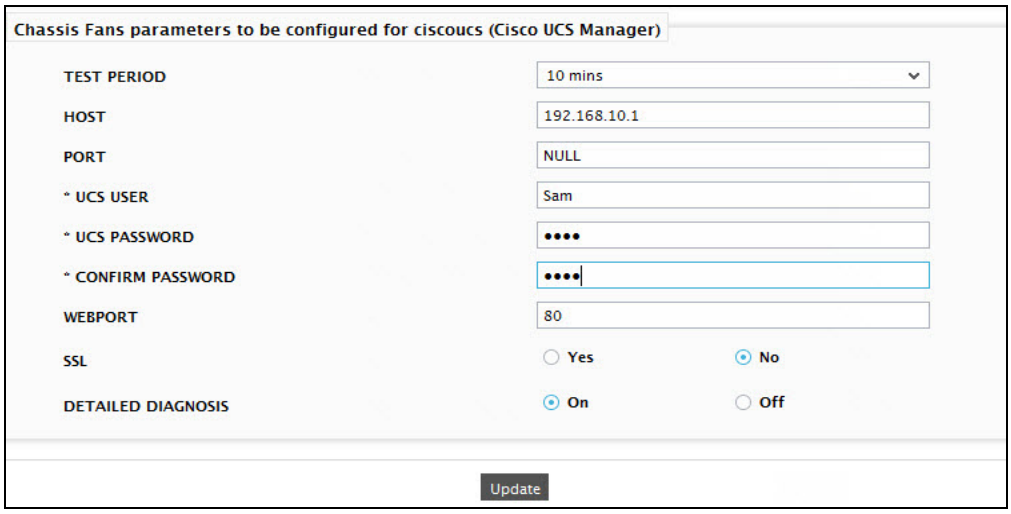

Figure 2.3: Configuring the Chassis Fans test

7. To know how to configure the tests, refer to **Monitoring the Cisco UCS Manager** chapter.
8. Finally, signout of the eG administrative interface.

Chapter 3: Monitoring the Cisco UCS Manager

eG Enterprise provides a 100%, web-based Cisco UCS Manager monitoring model that periodically monitors the Cisco UCS manager, discovers the chassis, I/O modules, blades, and fabric interconnects managed by the UCS manager, and determines the current status of each of these components.

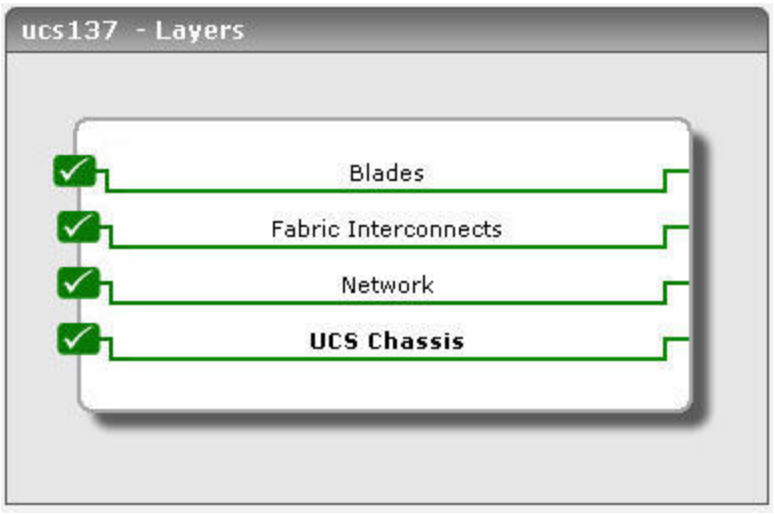

Figure 3.1: Layer model of the Cisco UCS Manager

Each layer of the layer model is mapped to a series of tests that instantly capture current/potential abnormalities in the state and functioning of the core components managed by the Cisco UCS manager, and alerts administrators to the same. With the help of the metrics collected by these tests, administrators can find quick and accurate answers for the following queries:

- Are all I/O modules (i.e., fabric extenders) operating normally? Is any I/O module in a degraded/powered-off/inoperable state currently? If so, which one is it?
- Is any I/O module experiencing any critical performance issues now?
- How is the power/voltage/thermal states of the I/O modules?
- Is any I/O module missing?
- Is the temperature of all I/O modules normal? Is any I/O module experiencing abnormal temperatures?
- Is any fan inoperable? In which chassis, does this fan exist?
- Does any fan operate at abnormal speeds?

- Is any fan experiencing any performance failures?
- Have non-recoverable problems occurred in the power/thermal /voltage states of any fan?
- How is the overall health of the chassis? Is any chassis in an inoperable state currently?
- Is any chassis license-insufficient?
- Are the power/thermal/voltage states of all chassis normal?
- Is any chassis receiving / transmitting more power than it can handle?
- Which fan module is currently in an inoperable state?
- Which fan module is behaving abnormally?
- Are all backplane ports healthy?
- Have any operational/performance issues been detected in any of the PSUs in the chassis?
- Which PSU is receiving voltage over 210 volts and emitting voltage over 12 volts?
- Are the fabric interconnects operating normally?
- Do the fabric interconnects have enough CPU and memory resources at their disposal? Is any fabric interconnect experiencing a CPU/memory contention?
- Are the PSUs of the fabric interconnects operating normally?
- Is the power/voltage input and output of the PSUs within acceptable limits?
- Have any uplink ethernet ports failed?
- Which uplink ethernet port is seeing very high traffic?
- Are the fans of all fabric interconnects operating normally?
- Is any uplink fibre channel port in an abnormal state?
- Are there any disabled uplink fibre channel ports?
- Is any fibre channel port seeing very high traffic?
- Is any fibre channel port experiencing too many errors in transmission?
- Are the blade servers in a chassis healthy?
- Is any blade server unavailable?
- Is the power state/slot state of the blade servers OK?
- Are the blade servers utilizing memory optimally? If any blade server over-utilizing the memory?

- Is the motherboard of any blade server consuming power/current excessively?
- Is the temperature of the motherboard normal? If not, then which side of the motherboard is experiencing abnormal temperatures - the front or the rear?
- Is the temperature of any memory array of any blade server very high?

The sections that follow will discuss each layer of the layer model.

3.1 UCS Chassis Layer

The Cisco UCS server chassis and its components are part of the Cisco Unified Computing System.

The Cisco UCS server chassis system consists of the following components:

- Cisco UCS server chassis
- Cisco UCS blade servers-up to eight half-width or four full-width blade servers, each containing two CPUs and holding up to two hard drives
- Cisco UCS I/O Module-up to two I/O modules, each providing four ports of 10-Gb Ethernet, Cisco Data Center Ethernet, and Fibre Channel over Ethernet (FCoE) connection to the fabric interconnect
- A number of SFP+ choices from copper to fiber
- Power supplies-up to four 2500 Watt hot-swapable power supplies
- Power Distribution Unit
- Fan modules-eight hot-swapable fan modules

As a problem in the chassis system can affect the overall performance of the Cisco UCS platform, you need to shield the chassis and its integral components from permanent physical or operational damage. To achieve this, you need proactive updates of probable threats to the health of the chassis system; these updates will enable you to initiate corrective measures before it is too late. The tests mapped to this layer provide you with such problem updates.

With the help of these tests, you can keep an eye on the status of each chassis managed by the Cisco UCS manager and also its core components such as the fabric extemders, fan modules, power supplies, etc., and quickly detect abnormalities.

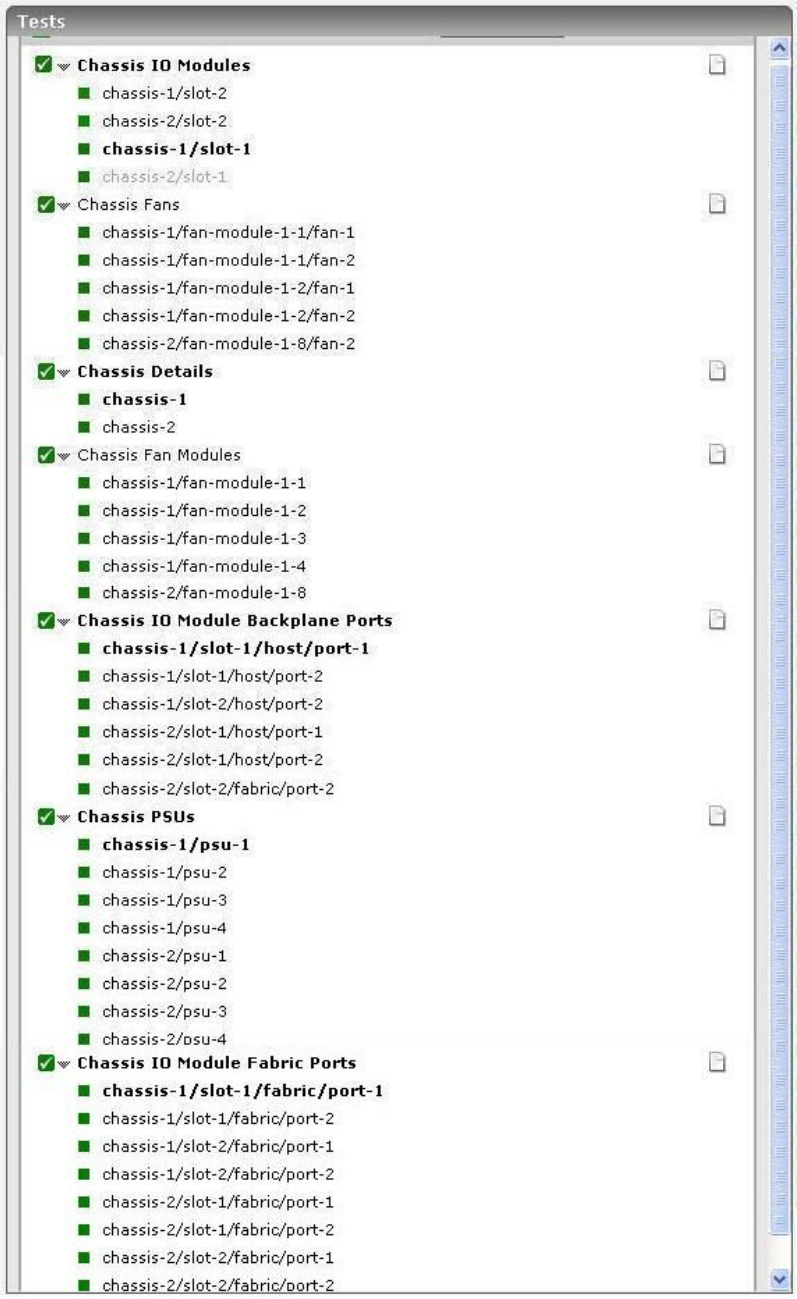

Figure 3.2: The tests mapped to the UCS Chassis layer

3.1.1 Chassis IO Modules Test

The Cisco UCS chassis contains I/O Modules or Fabric Extenders that allow the blade servers in the chassis to communicate with Cisco UCS Fabric Interconnects. The chassis supports up to two I/O Modules, each with four I/O ports.

The Cisco UCS Fabric Extenders bring the unified fabric into the blade server enclosure, providing 10 Gigabit Ethernet connections between blade servers and the fabric interconnect, simplifying diagnostics, cabling, and management.

The Cisco UCS Fabric Extenders extend the I/O fabric between the Cisco UCS Fabric Interconnects and the Cisco Blade Server Chassis, enabling a lossless and deterministic Fibre Channel over Ethernet (FCoE) fabric to connect all blades and chassis together. Since the fabric extender is similar to a distributed line card, it does not do any switching and is managed as an extension of the fabric interconnects. This approach removes switching from the chassis, reducing overall infrastructure complexity and enabling the Cisco Unified Computing System to scale to many chassis without multiplying the number of switches needed, reducing TCO and allowing all chassis to be managed as a single, highly available management domain.

The Cisco UCS Fabric Extenders also manages the chassis environment (the power supply and fans as well as the blades) in conjunction with the Fabric Interconnects. Therefore, separate chassis management modules are not required.

Cisco UCS Fabric Extenders fit into the back of the Cisco UCS Chassis. Each Cisco UCS Chassis can support up to two Fabric Extenders, enabling increased capacity as well as redundancy.

This test monitors the overall health of each of the I/O Modules present in every chassis managed by the Cisco UCS manager, and in the process, promptly alerts you to abnormalities in the power, thermal, voltage states of the modules and sudden spikes in the ambient/ASIC temperature of the modules. This way, defective I/O modules come to light.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each I/O module in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, this is *NULL*.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.

Parameter	Description
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Configuration state	Indicates the ccurrent onfiguration status of this I/O module present in this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Un-initialized</td><td>0</td></tr>
<tr><td>Un-acknowledged</td><td>1</td></tr>
<tr><td>Unsupported-connectivity</td><td>2</td></tr>
<tr><td>Ok</td><td>3</td></tr>
<tr><td>Removing</td><td>4</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the configuration status of the I/O module in this chassis. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents i.e., 0 to 4.
The detailed diagnosis of this measure provides the Time, ID, PID, Side, Chassis ID, Fabric ID, Revision, Serial Number and Vendor attributes for each I/O module.
</td></tr>
<tr><td>Overall status</td><td>Indicates the overall status of this I/O module present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
</table>
</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Not-Supported	100
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105
Peer-comm-problem	106
Auto-upgrade	107

Note:

By default, this measure reports the

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>above-mentioned States while indicating the status of the I/O module in this chassis. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this I/O module present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Operable</td><td>1</td></tr><tr><td>Inoperable</td><td>2</td></tr><tr><td>Degraded</td><td>3</td></tr><tr><td>Powered-off</td><td>4</td></tr><tr><td>Power-problem</td><td>5</td></tr><tr><td>Removed</td><td>6</td></tr><tr><td>Voltage-problem</td><td>7</td></tr><tr><td>Thermal-problem</td><td>8</td></tr><tr><td>Performance-problem</td><td>9</td></tr><tr><td>Accessibility-problem</td><td>10</td></tr><tr><td>Identity-unestablishable</td><td>11</td></tr><tr><td>Bios-post-timeout</td><td>12</td></tr><tr><td>Disabled</td><td>13</td></tr><tr><td>Fabric-conn-problem</td><td>51</td></tr><tr><td>Fabric-unsupported-conn</td><td>52</td></tr><tr><td>Config</td><td>81</td></tr></table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
<tr><td>Numeric Value</td><td>State</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operability of an I/O module in this chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance status of this I/O module present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>Note:
By default, this measure reports the above-mentioned States while indicating the performance state of an I/O module. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents.</td></tr>
<tr><td>Power state</td><td>Indicates the current power status of this I/O module in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr><tr><td>Off</td><td>3</td></tr><tr><td>Online</td><td>4</td></tr><tr><td>Offline</td><td>5</td></tr><tr><td>Offduty</td><td>6</td></tr><tr><td>Degraded</td><td>7</td></tr><tr><td>Power-save</td><td>8</td></tr><tr><td>Error</td><td>9</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>Note:
By default, this measure reports the above-mentioned States while indicating the power state of an I/O module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Presence state</td><td>Indicates the current state of this I/O module in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Empty</td><td>1</td></tr><tr><td>Equipped</td><td>10</td></tr><tr><td>Missing</td><td>11</td></tr><tr><td>Mismatch</td><td>12</td></tr><tr><td>Equipped- not-primary</td><td>13</td></tr><tr><td>Equipped- identity- unestablishable</td><td>20</td></tr><tr><td>Inaccessible</td><td>30</td></tr><tr><td>Unauthorized</td><td>40</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of the I/O module in this chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this I/O module present in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Ok</td><td>1</td></tr><tr><td>Upper- non-</td><td>2</td></tr></table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>recoverable</td><td></td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the thermal state of the I/O modules in this chassis. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.
</td></tr>
<tr><td>Voltage state</td><td>Indicates the current voltage state of this I/O module present in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the voltage state of the I/O module in this chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Ambient temperature</td><td>Indicates the current ambient temperature of this I/O module present in this chassis.</td><td>Celcius</td><td>An abnormal temperature may cause severe damage to the I/O modules.</td></tr>
<tr><td>ASIC temperature</td><td>Indicates the current temperature of the ASIC (Application-Specific Integrated Circuit) in this I/O module present in this chassis.</td><td>Celcius</td><td>An application-specific integrated circuit (ASIC) is an integrated circuit (IC) customized for a particular use, rather than intended for general-purpose use.
If an ASIC registers an abnormal temperature, it may severely affect the operations of the I/O module in which that ASIC operates.</td></tr>
</table>

The detailed diagnosis of *Configuration state* measure provides the Time, ID, PID, Side, Chassis ID, Fabric ID, Revision, Serial Number and Vendor attributes for each I/O module.

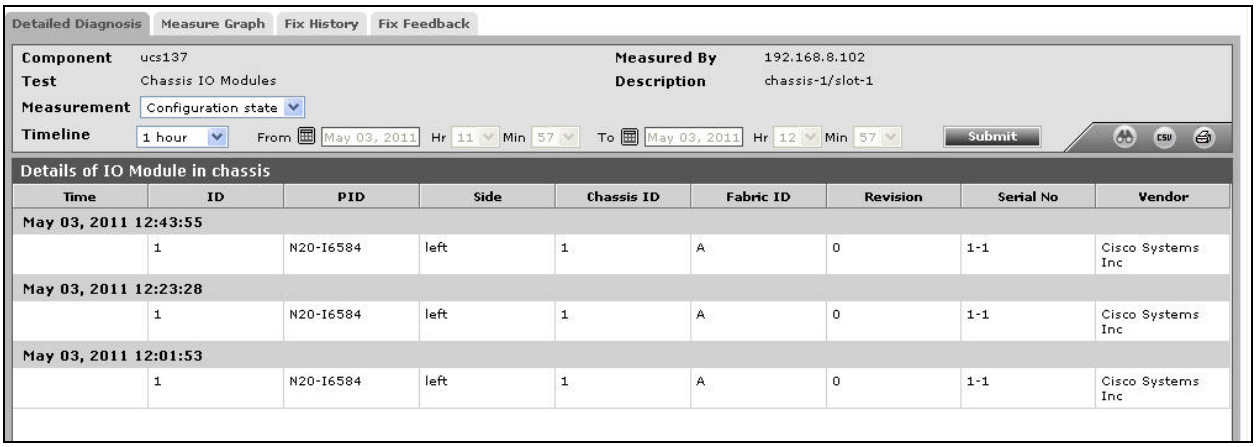

Figure 3.3: The detailed diagnosis of the Configuration state measure of the Chassis I/O Modules Test

3.1.2 Chassis Fans Test

A Cisco Blade Server Chassis contains the following components:

- Cisco UCS Fabric Extenders—Up to two fabric extenders (FEX), each FEX provides four ports of 10-Gigabit Ethernet, Cisco Data Center Ethernet, and Fibre Channel over Ethernet (FCoE)
- SFP+ transceiver choices that include copper and fiber optic
- Power supply units—Up to four 2500 W hot-swappable power supply units
- Fan modules—Eight hot-swappable fan modules
- Cisco UCS Blade Servers —Up to eight half-wide blade servers or four full-width blade servers, each holding RAID capable hard drives

This test monitors the overall health of each fan present in each chassis managed by the Cisco UCS manager, and proactively alerts users to the following:

- Fans that are in an abnormal operational state;
- Fans that are in a critical performance/thermal/voltage state;
- Fans in a degraded/errored power state;
- Fans operating at abnormal speeds.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fan in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this fan present in this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
</table>

The detailed diagnosis of this measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each fan in each chassis.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operational state of this fan present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
<tr><td>Removed</td><td>6</td></tr>
<tr><td>Voltage-problem</td><td>7</td></tr>
<tr><td>Thermal-problem</td><td>8</td></tr>
<tr><td>Performance-problem</td><td>9</td></tr>
<tr><td>Accessibility-problem</td><td>10</td></tr>
<tr><td>Identity-unestablishable</td><td>11</td></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric-unsupported-conn</td><td>52</td></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>By default, this measure reports the above-mentioned States while indicating the operability statusof a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance status of this fan present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:

<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Ok</td><td>1</td></tr><tr><td>Upper-non-recoverable</td><td>2</td></tr><tr><td>Upper-critical</td><td>3</td></tr><tr><td>Upper-non-critical</td><td>4</td></tr><tr><td>Lower-non-critical</td><td>5</td></tr><tr><td>Lower-critical</td><td>6</td></tr><tr><td>Lower non-recoverable</td><td>7</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>
Note:

By default, this measure reports the above-mentioned States while indicating the performance status of a fan. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power status of this fan present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>On</td><td>1</td></tr>
<tr><td>Test</td><td>2</td></tr>
<tr><td>Off</td><td>3</td></tr>
<tr><td>Online</td><td>4</td></tr>
<tr><td>Offline</td><td>5</td></tr>
<tr><td>Offduty</td><td>6</td></tr>
<tr><td>Degraded</td><td>7</td></tr>
<tr><td>Power-save</td><td>8</td></tr>
<tr><td>Error</td><td>9</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the power status of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Presence state</td><td>Indicates whether this fan currently exists in this chassis or not.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this fan present in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper- non- critical</td><td>4</td></tr>
<tr><td>Lower- non- critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>By default, this measure reports the above-mentioned States while indicating the thermal state of a fan. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>Voltage state</td><td>Indicates the current voltage state of this fan present in this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Ok</td><td>1</td></tr><tr><td>Upper-non-recoverable</td><td>2</td></tr><tr><td>Upper-critical</td><td>3</td></tr><tr><td>Upper-non-critical</td><td>4</td></tr><tr><td>Lower-non-critical</td><td>5</td></tr><tr><td>Lower-critical</td><td>6</td></tr><tr><td>Lower non-recoverable</td><td>7</td></tr><tr><td>Not-supported</td><td>-5</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the voltage state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Speed</td><td>Indicates the speed which this fan operates currently.</td><td>RPM</td><td>Ideally, the speed of the fans must be within normal limits.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure reveals the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each fan in each chassis.

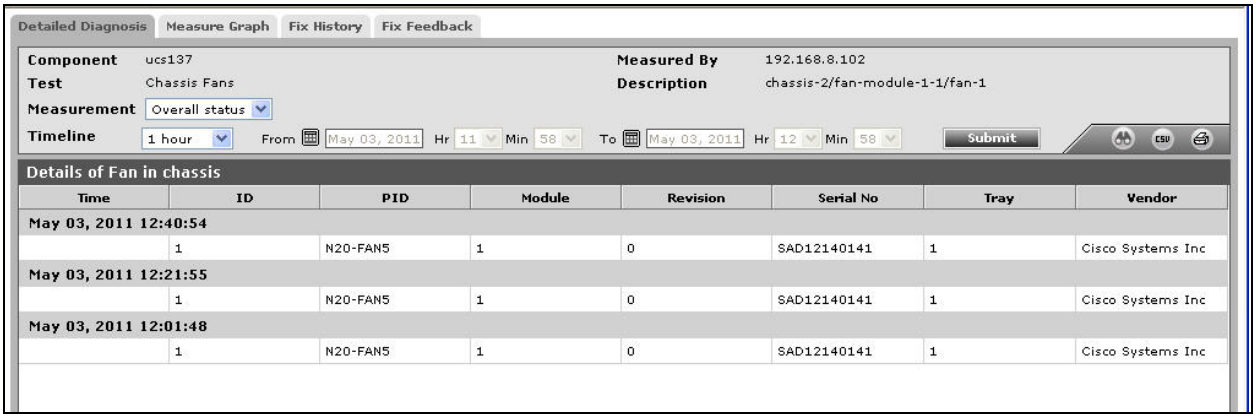

Figure 3.4: The detailed diagnosis of the Overall status measure of the Chassis Fans test

3.1.3 Chassis Details Test

The Cisco UCS 5100 Series Blade Server Chassis is a scalable and flexible blade server chassis for data centers. The chassis can house up to eight half-width Cisco UCS B-Series Blade Servers and can accommodate both half- and full-width blade form factors. Four single-phase, hot-swappable power supplies are accessible from the front of the chassis. These power supplies are 92 percent efficient and can be configured to support nonredundant, N+1 redundant, and grid-redundant configurations. The rear of the chassis contains eight hot-swappable fans, four power connectors (one per power supply), and two I/O bays for Cisco UCS 2104XP I/O modules. A passive midplane provides up to 20 Gbps of I/O bandwidth per server slot and up to 40 Gbps of I/O bandwidth for two slots.

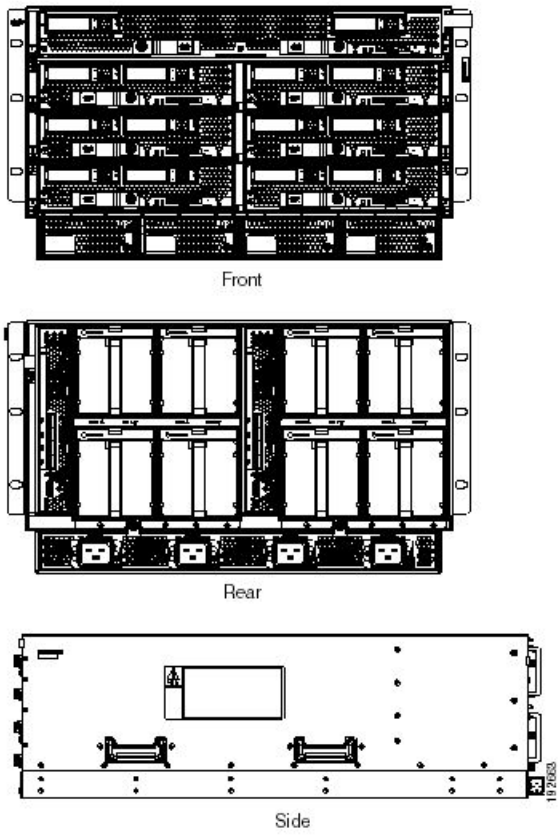

Figure 3.5: A Cisco UCS Blade Server Chassis

A Cisco UCS can support multiple chassis, each with two fabric extenders for redundancy.

By running periodic health checks on each chassis managed by a Cisco UCS manager, you can promptly identify the following:

- The chassis that is currently in an abnormal operational state;
- The insufficiently licensed chassis;
- Empty/missing chassis;
- The chassis that is experiencing serious power failures;
- The chassis with fans that are in a critical thermal state;
- The chassis that is handling unusually high input and output power.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Administrative state	Indicates the current administrative status of this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below: State: Acknowledged — Numeric Value: 1 State: Re-acknowledged — Numeric Value: 2 State: Decommission — Numeric Value: 3 State: Remove — Numeric Value: 4 **Note:** By default, this measure reports the above-mentioned States while indicating the administrative state of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only. The detailed diagnosis of this measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each chassis.
Configuration state	Indicates the current configuration state of this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below: State: Un-initialized — Numeric Value: 0

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Un- acknow-ledged</td><td>1</td></tr>
<tr><td>Unsupported-connectivity</td><td>2</td></tr>
<tr><td>Ok</td><td>3</td></tr>
<tr><td>Removing</td><td>4</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the configuration state of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>License state</td><td>Indicates the current license status of this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>License-ok</td><td>1</td></tr>
<tr><td>License- insuf-ficient</td><td>2</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the license state of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Overall status</td><td>Indicates the overall status of this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
<tr><td>Removed</td><td>6</td></tr>
<tr><td>Voltage-problem</td><td>7</td></tr>
<tr><td>Thermal-problem</td><td>8</td></tr>
<tr><td>Performance-problem</td><td>9</td></tr>
<tr><td>Accessibility-problem</td><td>10</td></tr>
<tr><td>Identity-unes-</td><td>11</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>tablishable</td><td></td></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric- unsupported-conn</td><td>52</td></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment- problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis- limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operability state of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Power state</td><td>Indicates the current power status of this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Failed</td><td>2</td></tr>
<tr><td>Input-failed</td><td>3</td></tr>
<tr><td>Input-degraded</td><td>4</td></tr>
<tr><td>Output-failed</td><td>5</td></tr>
<tr><td>Output-degraded</td><td>6</td></tr>
<tr><td>Redundancy-failed</td><td>7</td></tr>
<tr><td>Redundancy-degraded</td><td>8</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the power status of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Presence state</td><td>Indicates the current status of this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this chassis.</td><td></td><td>The State values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper- non- critical</td><td>4</td></tr>
<tr><td>Lower- non- critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			By default, this measure reports the above-mentioned States while indicating the thermal state of a chassis. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.
Input power	Indicates the current input power of this chassis.	Watts	An abnormally high or low power may cause serious damage to the hardware components of the chassis. Therefore, the value of this measure should be low.
Output power	Indicates the current output power of this chassis.	Watts	Ideally, the value of this measure should be low.

The detailed diagnosis of the *Administrative state* measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each chassis.

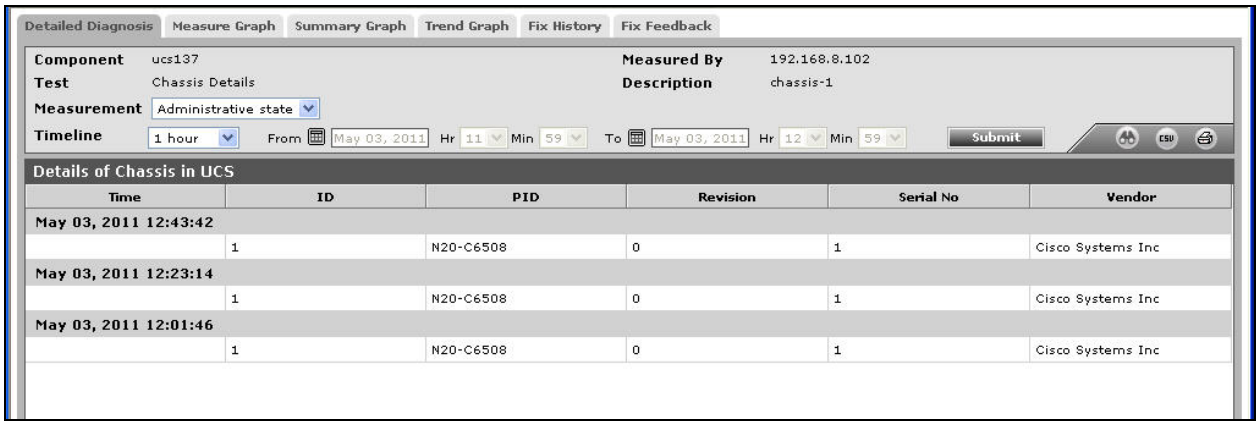

Figure 3.6: The detailed diagnosis of the Administrative state measure of the Chassis Details test

3.1.4 Chassis Fan Modules Test

The Cisco UCS Blade server chassis contains eight hot-swappable fan modules. These fan modules ensure that the internals of the chassis always receive adequate air flow and the temperature within the chassis is maintained at acceptable levels at all times. Snags in the functioning of the fan module can hence hamper air flow, which in turn may have disastrous effects on the health of the other chassis components.

By periodically monitoring the availability, overall health, operational state, and the temperature of fan module, you can promptly detect abnormalities in the operations of the module and initiate speedy remedial measures. This test does just that.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fan module available in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are

Parameter	Description
	detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this fan module present in this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric- unsupported-conn</td><td>52</td></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment- problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis- limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for the fan module.
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this fan module in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Operable</td><td>1</td></tr><tr><td>Inoperable</td><td>2</td></tr><tr><td>Degraded</td><td>3</td></tr><tr><td>Powered-off</td><td>4</td></tr><tr><td>Power-problem</td><td>5</td></tr><tr><td>Removed</td><td>6</td></tr><tr><td>Voltage-problem</td><td>7</td></tr><tr><td>Thermal-problem</td><td>8</td></tr><tr><td>Performance-problem</td><td>9</td></tr><tr><td>Accessibility-problem</td><td>10</td></tr><tr><td>Identity-unestablishable</td><td>11</td></tr><tr><td>Bios-post-timeout</td><td>12</td></tr><tr><td>Disabled</td><td>13</td></tr><tr><td>Fabric-conn-problem</td><td>51</td></tr><tr><td>Fabric-unsupported-conn</td><td>52</td></tr><tr><td>Config</td><td>81</td></tr><tr><td>Equipment-problem</td><td>82</td></tr><tr><td>Decommissioning</td><td>83</td></tr><tr><td>Chassis-limit-exceeded</td><td>84</td></tr><tr><td>Discovery</td><td>101</td></tr></table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operating state of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance state of this fan module in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>Note:

By default, this measure reports the above-mentioned States while indicating the performance state of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power state of this fan module in this chassis</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:

<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr><tr><td>Off</td><td>3</td></tr><tr><td>Online</td><td>4</td></tr><tr><td>Offline</td><td>5</td></tr><tr><td>Offduty</td><td>6</td></tr><tr><td>Degraded</td><td>7</td></tr><tr><td>Power-save</td><td>8</td></tr><tr><td>Error</td><td>9</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>
Note:

By default, this measure reports the above-mentioned States while indicating the power state of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Presence state</td><td>Indicates whether this fan module exists or not in this chassis currently.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the existence of a fan module in a chassis. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this fan module present in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper- non- crit-</td><td>4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>ical</td><td></td></tr>
<tr><td>Lower- non- crit- ical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-Supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current thermal state of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Exhaust temperature</td><td>Indicates the current exhaust temperature of the fans present in this fan module in this chassis.</td><td></td><td>Since an abnormal temperature can cause damage to the fans, the value of this measure should be well within normal limits.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for the fan module.

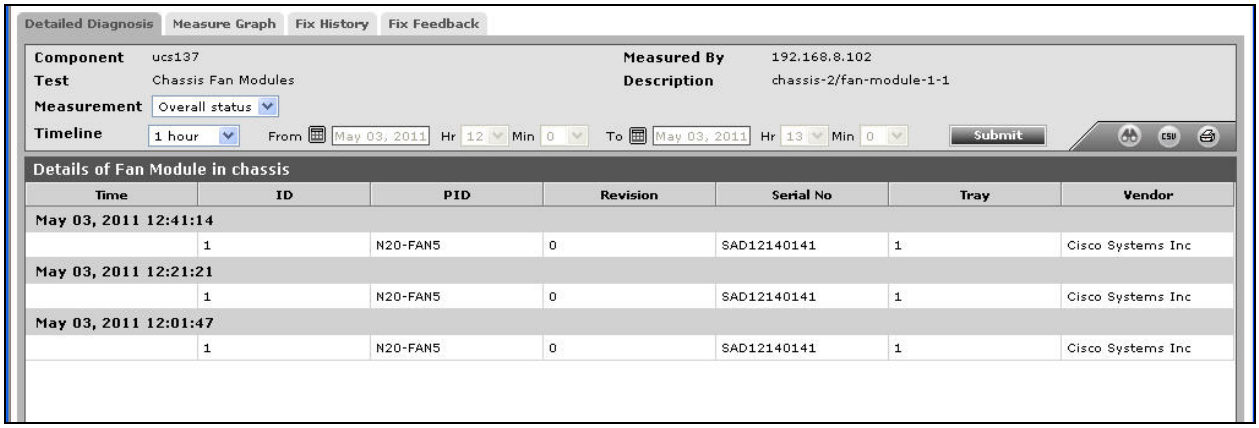

Figure 3.7: The detailed diagnosis of the Overall status measure of the Chassis Fan Modules test

3.1.5 Chassis IO Module Backplane Ports Test

The Cisco UCS chassis supports eight blade slots, and each blade has two Intel Xeon "Nehalem" processors and up to 96GB of RAM. The chassis also has two SAS drive slots and a RAID controller, plus a connection to the backplane. The chassis is responsible for providing support infrastructure to blades via the backplane connection.

A **backplane** is a circuit board (usually a printed circuit board) that connects several connectors in parallel to each other, so that each pin of each connector is linked to the same relative pin of all the other connectors forming a computer bus. It is used as a backbone to connect several printed circuit boards together to make up a complete computer system.

In Cisco UCS, all network traffic flows over FCoE directly from the chassis backplane to an FI (Fabric Interconnect) device.

To make sure that the blades in the chassis receive prompt and uninterrupted networking services, you need to frequently check whether the backplane ports of the chassis are available and operational. The **Chassis IO Module Backplane Ports** test makes this verification possible. At pre-configured intervals, this test monitors the health of each of the backplane ports in every I/O module of a chassis, and reports whether they are operational or not. Backplane ports experiencing errors, hardware failures, or software failures can thus be identified quickly and accurately.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each backplane port in each I/O module of every Cisco UCS chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.

Parameter	Description
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this backplane port.		The States reported by this measure and their corresponding numeric equivalents are described in the table below: State: Numeric Value Indeterminate: 0 Up: 1 Admin-down: 2 Link-down: 3 Failed: 4 No-license: 5 Link-up: 6 Hardware- failure: 7

Measurement	Description	Measurement Unit	Interpretation
			<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Software-failure</td><td>8</td></tr><tr><td>Error-disabled</td><td>9</td></tr><tr><td>Sfp-not-present</td><td>10</td></tr></table> **Note:** By default, this measure reports the above-mentioned States while indicating the overall health of a backplane port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.

3.1.6 Chassis PSUs Test

A Cisco UCS Blade Server Chassis can be provided with upto four 2500 Watt hot-swappable power supplies.

As issues in the power supply units can adversely impact the performance of the blades in a chassis, administrators need to promptly detect power-related issues and rectify them before any irrepairable damage is done. This test aids in the timely detection of the following anomalies related to PSUs:

- Abnormalities in the overall PSU health;
- Operational deficiencies;
- Critical performance setbacks;
- Unrecoverable power/thermal/voltage failures;
- Disturbing rise in temperature;
- Input/output voltage, current, and power that exceeds permissible limits.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each PSU in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this PSU in this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, PID, Revision, Serial Number and Vendor attributes for the PSU.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operational state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>the performance state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr><tr><td>Off</td><td>3</td></tr><tr><td>Online</td><td>4</td></tr><tr><td>Offline</td><td>5</td></tr><tr><td>Offduty</td><td>6</td></tr><tr><td>Degraded</td><td>7</td></tr><tr><td>Power-save</td><td>8</td></tr><tr><td>Error</td><td>9</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the power state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Presence state</td><td>Indicates the current state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper- non- critical</td><td>4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current thermal state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Voltage state</td><td>Indicates the current voltage state of this PSU in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			above-mentioned States while indicating the current voltage state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
Internal temperature	Indicates the current internal temperature of this PSU in this chassis.	Celsius	A high temperature is a cause for concern, as it may cause severe damage to the PSUs, which in turn may degrade the performance of the blade server chassis.
Input210v	Indicates the current input voltage of this PSU in this chassis.	Volts	Any value higher than 210 volts could indicate a problem condition that may require further investigation.
Output12v	Indicates the current output voltage of this PSU in this chassis.	Volts	Any value higher than 12 volts could indicate a problem condition that may require further investigation.
Output3v3	Indicates the current output voltage of this PSU in this chassis.	Volts	Any value higher than 3.3 volts could indicate a problem condition that may require further investigation.
Output current	Indicates the output current of this PSU in this chassis.	Amps	Ideally, the value of this measure should be low. A sudden/consistent increase in this value could warrant an investigation.
Output power	Indicates the output power of this PSU in this chassis.	Watts	Ideally, the value of this measure should be low. A sudden/consistent increase in this value could warrant an investigation.

The detailed diagnosis of the *Overall status* measure provides the Time, ID, PID, Revision, Serial Number and Vendor attributes for the PSU.

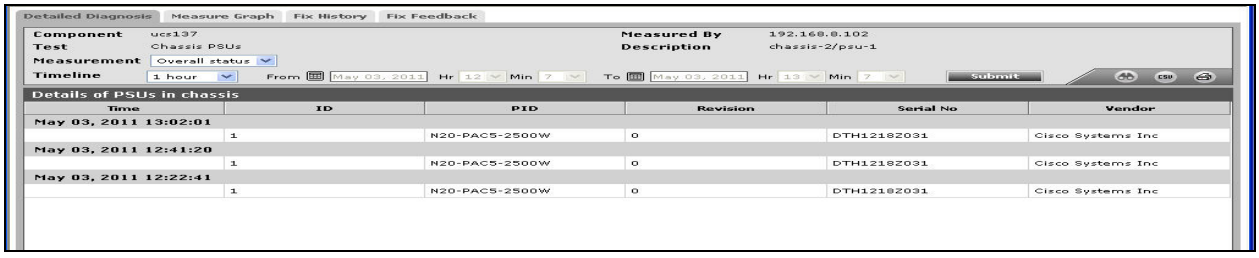

Figure 3.8: The detailed diagnosis of the Overall status measure of the Chassis PSUs test

3.1.7 Chassis IO Module Fabric Ports Test

A typical Cisco UCS system supports upto two I/O modules, each configured with four ports of 10-Gb Ethernet, Cisco Data Center Ethernet, and Fibre Channel over Ethernet (FCoE) connection to the fabric interconnect. Since the I/O module acts as a bridge between the UCS blades and the fabric interconnect, all ethernet connections to the fabric interconnect will get suspended if one/more ports are rendered unavailable or non-operational for a brief period. It is hence imperative that the administrators be promptly alerted when the I/O module ports start behaving abnormally so that, remedial measures can be initiated instantaneously to avoid a prolonged port outage. This test monitors the overall health and availability of each of the ports in every I/O module, and sends out proactive alerts to potential performance anomalies.

Target of the test : A Cisco UCS Manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fabric port in each I/O module of every chassis managed by the Cisco UCS Manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, this is NULL.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS Manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS Manager

Parameter	Description
	communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS Manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this port in this I/O module.		The States reported by this measure and their corresponding numeric equivalents are described in the table below: State: Numeric Value Indeterminate: 0 Up: 1 Admin-down: 2 Link-down: 3 Failed: 4 No-license: 5

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Link-up</td><td>6</td></tr>
<tr><td>Hardware-failure</td><td>7</td></tr>
<tr><td>Software-failure</td><td>8</td></tr>
<tr><td>Error-disabled</td><td>9</td></tr>
<tr><td>Sfp-not-present</td><td>10</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure Time, ID, Slot ID, Chassis ID, Fabric ID, Port Type, Role Type, Network Type, Transport Type and Peer details of the I/O module fabric ports.
</td></tr>
<tr><td>Acknowledged state</td><td>Indicates the current acknowledgment status of this port in this I/O module.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Un-initialized</td><td>1</td></tr>
<tr><td>Un-acknowledged</td><td>2</td></tr>
<tr><td>Unsupported-connectivity</td><td>3</td></tr>
<tr><td>Ok</td><td>4</td></tr>
<tr><td>Removing</td><td>5</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>Note:
By default, this measure reports the above-mentioned States while indicating the acknowledgment state of a port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Discovery state</td><td>Indicates the current discovered status of this port in this I/O module.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Absent</td><td>0</td></tr><tr><td>Present</td><td>1</td></tr><tr><td>Mis-connect</td><td>2</td></tr><tr><td>Missing</td><td>3</td></tr><tr><td>New</td><td>4</td></tr></table>Note:
By default, this measure reports the above-mentioned States while indicating the discovery state of a port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure reports the Time, ID, Slot ID, Chassis ID, Fabric ID, Port Type, Role Type, Network Type, Transport Type and Peer details of the I/O module fabric ports.

Details of IO Module Fabric ports in chassis

Time	ID	Slot ID	Chassis ID	Fabric ID	Port Type	Role Type	Network Type	Transport Type	Peer
May 03, 2011 12:30:37									
	2	1	1	A	physical	server	lan	dce	sys/switch-A/slot-1/switch-ether/port-3

Figure 3.9: The detailed diagnosis of the Overall status measure of the Chassis I/O Module Fabric Ports Test

3.1.8 Fault Summary Test

A fault is a mutable object that is managed by the Cisco UCS Manager. Each fault represents a failure in the Cisco UCS Manager or an alarm threshold that has been raised. The fault can change from one state or severity to another during its lifecycle. Each fault includes information about the operational state of the affected object at the time the fault was raised. If the fault is transitional and the failure is resolved, then the object transitions to a functional state.

The fault remains in the Cisco UCS Manager until the fault is cleared and deleted according to the settings in the fault collection policy. The fault collection policy controls the lifecycle of a fault in a Cisco UCS instance, including when faults are cleared, the flapping interval (the length of time between the fault being raised and the condition being cleared), and the retention interval (the length of time a fault is retained in the system). The fault, if not detected earlier, may cause the following types of problems:

- service unavailability
- power problem, thermal problem and voltage problem,
- component configuration failures,
- serious management issues,
- poor adapter connectivity,
- network issue such as link down,
- log capacity issue or failed server discovery.

To prevent the above-said problems, the faults raised in the Cisco UCS Manager should be tracked at regular intervals and cleared before the operation of the Cisco UCS Manager comes to a halt! The **Faults Summary** test helps administrators in this regard!

This test monitors the faults raised in the Cisco UCS Manager and for each severity, this test reports the number of faults raised. Using this test, administrators can figure out which severity type of faults were raised at the maximum and take corrective measures to rectify the same.

Target of the test : A Cisco UCS Manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for the Cisco UCS Manager that is being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS Manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS Manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS Manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS Manager - i.e., if Cisco UCS Manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS Manager using port 80 by default, and if Cisco UCS Manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS Manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS Manager.
Show Info DD	Typically, if the Detailed Diagnosis flag is set to **On** for this test, then periodically, eG Enterprise collects the complete details of all the information received by the Cisco UCS Manager, and stores them in the database. This way, whenever a user clicks on the Diagnosis icon (magnifying glass icon) corresponding to the *Information* measures reported by this test in the monitoring console, eG Enterprise retrieves the relevant detailed diagnosis information from the database and provides it to the user. In large environments however, the number of informational messages received on the Cisco UCS Manager will be quite huge. Naturally, the detailed diagnosis of such messages will also occupy a considerable amount of database space, which will only grow with

Parameter	Description
	time. In order to minimize the strain on the eG database, by default, the detailed diagnosis capability for the information events alone is turned off in the eG Enterprise system. Accordingly, the Show Info DD flag is set to **False** by default. However, you can this flag is set to **True**, so that detailed diagnosis is available for information events as well.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Critical Faults	Indicates the number of Critical fault events that occurred during the last measurement period.	Number	Ideally, value of this measure should be zero. A critical fault is a service-affecting condition that requires immediate corrective action. For instance, the critical severity could indicate that the managed object is out of service and its capability must be restored.
Major Faults	Indicates the number of Major fault events that occurred during the last measurement period.	Number	Ideally, the value of this measure should be zero. A major fault is a service-affecting condition that requires urgent corrective action. A significant increase in the value of this measure indicates that a severe degradation in the capability of the managed object.

Measurement	Description	Measurement Unit	Interpretation
Minor Faults	Indicates the number of Minor fault events that occurred during the last measurement period.	Number	Ideally, the value of this measure should be zero. A minor fault condition requires corrective action to prevent a more serious fault from occurring.
Warning Faults	Indicates the number of Warning fault events that occurred during the last measurement period.	Number	Ideally, the value of this measure should be very low. A warning fault is a potential or impending service-affecting fault that currently has no significant effects in the system. Corrective actions should be taken to further diagnose, if necessary, and correct the problem to prevent it from becoming a more serious service-affecting fault.
Information	Indicates the number of information/notifications that were received during the last measurement period.	Number	A basic notification or informational message, independently insignificant, provides the details on state changes and fault transitions. For more details about these messages, use the detailed diagnosis of this measure.

3.2 The Network Layer

Determine the availability of the Cisco UCS manager the network, and quickly isolate latencies while establishing a network connection with the Cisco UCS manager, using the tests mapped to this layer.

Figure 3.10: The tests mapped to the Network layer

Since the **Network** test mapped to this layer has already been dealt with in the *Monitoring Unix and Windows Servers* document, let us proceed to take a look at the **Fabric Interconnects** layer in this test.

3.3 The Fabric Interconnects Layer

A core part of the Cisco Unified Computing System, the Cisco UCS Fabric Interconnects provide both network connectivity and management capabilities to all attached blades and chassis. The Cisco UCS Fabric Interconnects offers line-rate, low-latency, lossless 10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE) functions.

The interconnects provide the management and communication backbone for the Cisco UCS Blades and UCS Blade Server Chassis. All chassis, and therefore all blades, attached to the interconnects become part of a single, highly available management domain. In addition, by supporting unified fabric, the Cisco UCS Fabric Interconnects provides both the LAN and SAN connectivity for all blades within its domain.

Typically deployed in redundant pairs, fabric Interconnects provide uniform access to both networks and storage, eliminating the barriers to deploying a fully virtualized environment.

This layer monitors the fabric interconnects and their critical hardware components such as the PSUs, the uplink and FC ports, and fans, and proactively alerts administrators to potential hardware failures and operational issues experienced by the fabric interconnects; this way, the layer ensures the continuous availability of the interconnects, and thus eliminates any disruption in communication for the blades and the blade server chassis.

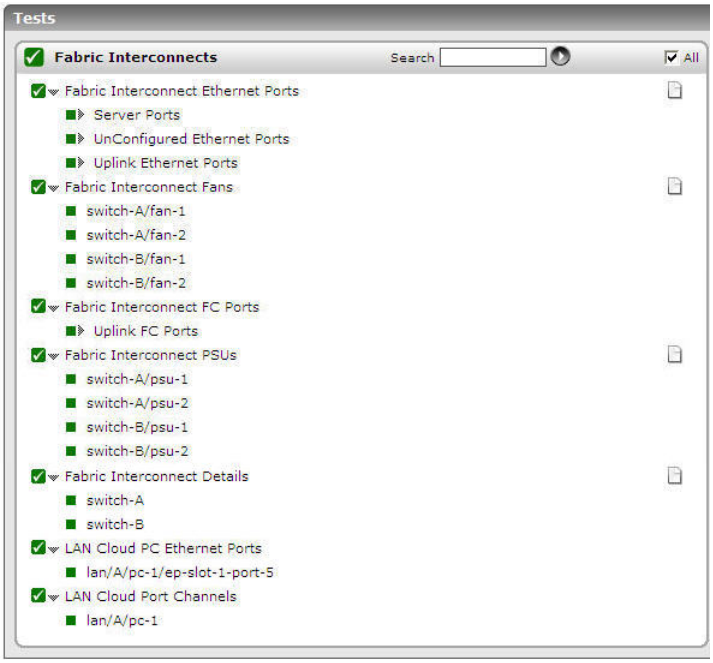

Figure 3.11: The tests mapped to the Fabric Interconnects layer

3.3.1 Fabric Interconnect PSUs Test

The Cisco UCS Fabric Interconnects is provided with two front end slots to support Power Supply Units. The failure of a power supply unit, if not readdressed promptly, can cause short to prolonged breaks in the availability of the interconnects. Moreover, a sudden yet steep rise in the power/voltage/current handled by a PSU may not only injure that PSU, but also cause damage to the associated fabric interconnect. To avoid such adversities, the PSUs supported by each fabric interconnect should be periodically monitored.

This test monitors the overall health of each PSU supported by every fabric interconnect and promptly reports abnormalities such as operational issues experienced by the PSUs, critical PSU failures, serious errors in the power/thermal/voltage state of each PSU, and inexplicable surges in the input power/voltage/current of a PSU.

Target of the test : A Cisco UCS Manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each PSU in each fabric interconnect managed by the Cisco UCS Manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, it is *NULL*.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS Manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS Manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS Manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS Manager - i.e., if Cisco UCS Manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS Manager using port 80 by default, and if Cisco UCS Manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS Manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS Manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Overall status</td><td>Indicates the overall status of this PSU in this interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
<tr><td>Removed</td><td>6</td></tr>
<tr><td>Voltage-problem</td><td>7</td></tr>
<tr><td>Thermal-problem</td><td>8</td></tr>
<tr><td>Performance-problem</td><td>9</td></tr>
<tr><td>Accessibility-problem</td><td>10</td></tr>
<tr><td>Identity-unestablishable</td><td>11</td></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric-unsupported-conn</td><td>52</td></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Not-supported</td><td>100</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, PID, Revision, Serial Number and Vendor attributes of the Fabric Interconnect PSU.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
</table>
</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Not-supported	100
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105
Peer-comm-problem	106
Auto-upgrade	107

Note:

Measurement	Description	Measurement Unit	Interpretation
			By default, this measure reports the above-mentioned States while indicating the operational state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Performance state</td><td>Indicates the current performance state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Ok</td><td>1</td></tr><tr><td>Upper-non-recoverable</td><td>2</td></tr><tr><td>Upper-critical</td><td>3</td></tr><tr><td>Upper-non-critical</td><td>4</td></tr><tr><td>Lower-non-critical</td><td>5</td></tr><tr><td>Lower-critical</td><td>6</td></tr><tr><td>Lower non-recoverable</td><td>7</td></tr><tr><td>Not Available</td><td>-5</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the performance state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr></table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Off</td><td>3</td></tr>
<tr><td>Online</td><td>4</td></tr>
<tr><td>Offline</td><td>5</td></tr>
<tr><td>Offduty</td><td>6</td></tr>
<tr><td>Degraded</td><td>7</td></tr>
<tr><td>Power-save</td><td>8</td></tr>
<tr><td>Error</td><td>9</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the power state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Presence state</td><td>Indicates the current state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>Note:
By default, this measure reports the above-mentioned States while indicating the current state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Ok</td><td>1</td></tr><tr><td>Upper-non-recoverable</td><td>2</td></tr><tr><td>Upper-critical</td><td>3</td></tr><tr><td>Upper-non-critical</td><td>4</td></tr><tr><td>Lower-non-critical</td><td>5</td></tr><tr><td>Lower-critical</td><td>6</td></tr><tr><td>Lower non-recoverable</td><td>7</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>Note:
By default, this measure reports the above-mentioned States while indicating the current thermal state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Voltage state</td><td>Indicates the current voltage state of this PSU in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current voltage state of a PSU. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Input current</td><td>Indicates the input current received by this PSU in this fabric interconnect.</td><td>Amps</td><td>An abnormally high or low value of current may cause severe damage to the Fabric Interconnect PSUs.</td></tr>
<tr><td>Input power</td><td>Indicates the input power received by this PSU in this fabric interconnect.</td><td>Watts</td><td>An abnormally high or low value of input power may cause severe damage to the Fabric Interconnect PSUs.</td></tr>
<tr><td>Input voltage</td><td>Indicates the input voltage received by this PSU in this fabric interconnect.</td><td>Volts</td><td>An abnormally high or low value of input voltage may cause severe damage to the fabric interconnect PSUs.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure provides the Time, ID, PID, Revision, Serial Number and Vendor attributes of the fabric interconnect PSU.

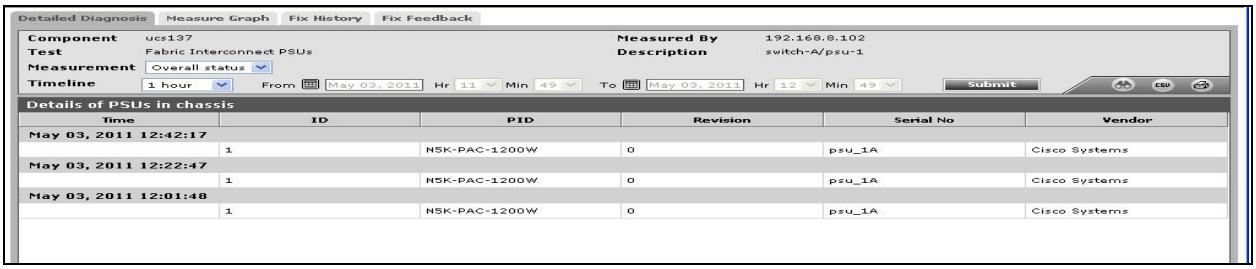

Figure 3.12: The detailed diagnosis of the Overall status measure of the Fabric Interconnect PSUs test

3.3.2 Fabric Interconnect Ethernet Ports Test

The Cisco UCS fabric interconnect includes the following key Ethernet port types:

- **Server Ports** - Server ports handle data traffic between the fabric interconnect and the adapter cards on the servers. You can only configure server ports on the fixed port module. Expansion modules do not include server ports.
- **Uplink Ethernet Ports** - Uplink Ethernet ports handle ethernet traffic between the UCS fabric interconnect and the next layer of the network. All network-bound Ethernet traffic is pinned to one of these ports. You can configure uplink Ethernet ports on either the fixed module or an expansion module.
- **Appliance Ports** - The Appliance port is intended for connecting Ethernet-based storage arrays (such as those serving iSCSI or NFS services) directly to the Fabric Interconnect. By adding this Appliance port type, you can ensure that any port configured as an Appliance Port will not be selected to receive broadcast/multicast traffic from the Ethernet fabric, as well as providing the ability to configure VLAN support on the port independently of the other Uplink ports.
- **FCoE Storage Ports** - The FCoE Storage Port type provides similar functionality as the Appliance Port type, while extending FCoE protocol support beyond the Fabric Interconnect. Note that this is not intended for an FCoE connection to another FCF (FCoE Forwarder). Only direct connection of FCoE storage devices (such as those produced by NetApp and EMC) are supported. When an Ethernet port is configured as an FCoE Storage Port, traffic is expected to arrive without a VLAN tag. The Ethernet headers will be stripped away and a VSAN tag will be added to the FC frame.

In addition, the fabric interconnect supports **Monitoring Ethernet Ports**, and Ethernet ports that have not yet been configured to perform any function and are hence still **UnConfigured Ethernet Ports**.

This test enables you to run frequent health checks on these ports so that, you can quickly identify non-operational, overloaded, or slow ports. Whenever ethernet traffic slows down, you can use this

information to figure out which ethernet port is responsible for it. Moreover, in times of heavy traffic, this information will enable you to decide whether additional ports need to be configured using the expansion module for handling the load.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each ethernet port managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are

Parameter	Description
	detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Administrative state	Indicates the current administrative status of this uplink ethernet port in this fabric interconnect.		This measure reports either Enabled or Disabled as the administrative status of the Fabric Interconnect Uplink Ethernet ports. The states and their corresponding numeric equivalents are shown in the table below: State: Enabled — Numeric Value: 1 State: Disabled — Numeric Value: 2 **Note:** By default, this measure reports the above-mentioned States while indicating the administrative status of a Fabric Interconnect Uplink Ethernet port. However, in the graph of this measure, states will be represented using their numeric equivalents only - i.e., 1 or 2.
Overall status	Indicates the overall status of this uplink ethernet port in this fabric interconnect.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Indeterminate</td><td>0</td></tr>
<tr><td>Up</td><td>1</td></tr>
<tr><td>Admin-down</td><td>2</td></tr>
<tr><td>Link-down</td><td>3</td></tr>
<tr><td>Failed</td><td>4</td></tr>
<tr><td>No-license</td><td>5</td></tr>
<tr><td>Link-up</td><td>6</td></tr>
<tr><td>Hardware-failure</td><td>7</td></tr>
<tr><td>Software-failure</td><td>8</td></tr>
<tr><td>Error-disabled</td><td>9</td></tr>
<tr><td>Sfp-not-present</td><td>10</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned states while indicating the overall status of an uplink ethernet port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, Slot ID, Port Type, Role Type, Transport Type, Network Type, MAC and Mode attributes for the ethernet ports.
</td></tr>
<tr><td>Operational speed</td><td>Indicates the current operating speed of this uplink ethernet port in this fabric interconnect.</td><td></td><td>The values reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Indeterminate</td><td>0</td></tr>
<tr><td>1Gbps</td><td>1</td></tr>
<tr><td>10Gbps</td><td>2</td></tr>
<tr><td>20Gbps</td><td>3</td></tr>
<tr><td>40Gbps</td><td>4</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned Measure Values while indicating the operational speed of an uplink ethernet port. However, in the graph of this measure, the speed will be represented using the corresponding numeric equivalents only.
</td></tr>
<tr><td>Broadcast packets received</td><td>Indicates the number of broadcast packets received by this uplink ethernet port during the last measurement period .</td><td>Number</td><td rowspan="2">In computer networking, broadcasting refers to transmitting a packet that will be received by every device on the network. Broadcasting can be performed as a high level operation in a program, for example broadcasting Message Passing Interface, or it may be a low level networking operation, for example broadcasting on Ethernet.
Comparing the value of these measures across all the uplink ethernet ports will point you to that port which is handling the maximum broadcast traffic.</td></tr>
<tr><td>Broadcast packets transmitted</td><td>Indicates the number of broadcast packets transmitted by this uplink ethernet port during the last measurement period.</td><td>Number</td></tr>
<tr><td>Jumbo packets received</td><td>Indicates the number of jumbo packets received by this uplink ethernet port during the last measurement period.</td><td>Number</td><td>In computer networking, jumbo frames are Ethernet frames with more than 1500 bytes of payload. Conventionally, jumbo frames can carry up to 9000 bytes of payload, but variations may exist.
In the event of a network slowdown, you can compare the value of these</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
Jumbo packets transmitted	Indicates the number of jumbo packets transmitted by this uplink ethernet port during the last measurement period.	Number	measures across all the uplink ethernet ports to quickly isolate the port that is overloaded with jumbo packets.
Multicast packets received	Indicates the number of multipcast packets received by this uplink ethernet port during the last measurement period.	Number	In computer networking, multicast is the delivery of a message or information to a group of destination computers simultaneously in a single transmission from the source creating copies automatically in other network elements, such as routers, only when the topology of the network requires it. In the event of a network slowdown, you can compare the value of these measures across all the uplink ethernet ports to quickly isolate the port that is overloaded with multicast packets.
Multicast packets transmitted	Indicates the number of multipcast packets sent by this uplink ethernet port during the last measurement period.	Number	
Data received	Indicates the amount of data received by this uplink ethernet port during the last measurement period.	MB	Compare the value of these measures across all ethernet ports to determine which port is handling the maximum data traffic.
Data transmitted	Indicates the amount of data transmitted by this uplink ethernet port during the last measurement period.	MB	
Packets received	Indicates the number of packets received by this uplink ethernet port during the last measurement period.	Number	Compare the value of these measures across all ethernet ports to determine which port is handling the maximum packet traffic.
Packets transmitted	Indicates the number of packets transmitted by this uplink ethernet port during the last	Number	

Measurement	Description	Measurement Unit	Interpretation
	measurement period.		
Unicast packets received	Indicates the number of unicast packets received by this uplink ethernet port during the last measurement period.	Number	Unicast is the term used to describe communication where a piece of information is sent from one point to another point. In this case there is just one sender, and one receiver. Compare the value of these measures across all ethernet ports to determine which port is handling the maximum unicast packet traffic.
Unicast packets transmitted	Indicates the number of unicast packets transmitted by this uplink ethernet port during the last measurement period.	Number	

The detailed diagnosis of the *Overall status* measure provides the Time, ID, Slot ID, Port Type, Role Type, Transport Type, Network Type, MAC and Mode attributes for the ethernet ports.

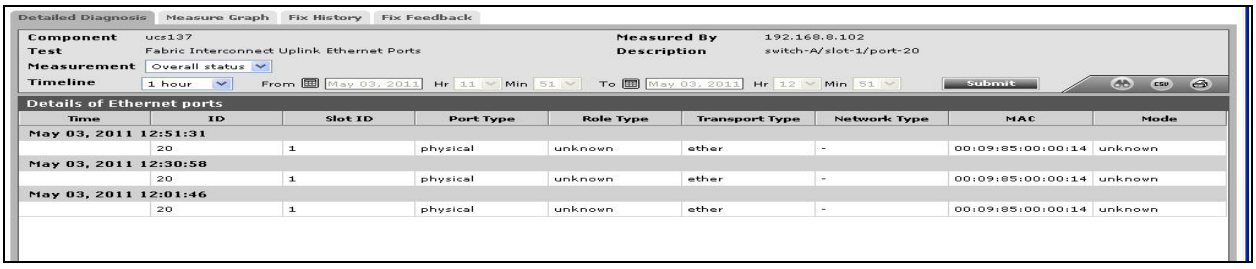

Figure 3.13: The detailed diagnosis of the Overall status measure of the Fabric Interconnect Uplink Ethernet Ports test

3.3.3 Fabric Interconnect Fans Test

The Cisco UCS Fabric Interconnects comprise of two slots on the front of the chassis for fan modules. Each fan module houses six fans. The combination of six fans for each module and two modules provides the chassis with 12 fans. Use this test to closely monitor the availability, overall health, and performance of each of these fans and report anomalies so that, you can promptly initiate measures to ensure that adequate air flow is available in the fabric interconnects.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fan in each fabric interconnect managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this fan in this fabric interconnect.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each fan in the fabric interconnect.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operational state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>the performance state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr><tr><td>Off</td><td>3</td></tr><tr><td>Online</td><td>4</td></tr><tr><td>Offline</td><td>5</td></tr><tr><td>Offduty</td><td>6</td></tr><tr><td>Degraded</td><td>7</td></tr><tr><td>Power-save</td><td>8</td></tr><tr><td>Error</td><td>9</td></tr><tr><td>Not-supported</td><td>100</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the power state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Presence state</td><td>Indicates the current state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper- non- critical</td><td>4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current thermal state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Voltage state</td><td>Indicates the current voltage state of this fan in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			above-mentioned States while indicating the current voltage state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.

The detailed diagnosis of the *Overall status* measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each fan in the fabric interconnect.

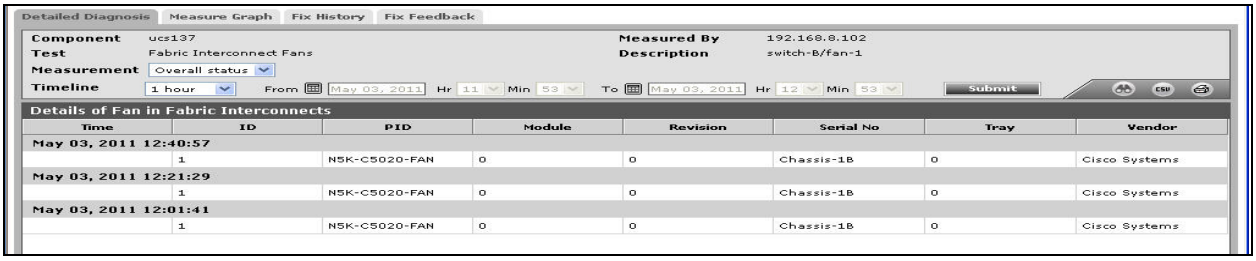

Figure 3.14: The detailed diagnosis of the Overall status measure of the Fabric Interconnect Fans test

3.3.4 Fabric Interconnect Fan Modules Test

A Cisco UCS fabric interconnect is a top-of-rack fabric interconnect that provides Ethernet and Fibre Channel to all servers in the UCS system. Servers connect to the fabric interconnect, and it connects to the LAN or SAN. Depending on the model of the Cisco UCS, the fabric interconnects may contain upto four fan modules. Each fan module contains four fans. The fans in the fan module help ensure adequate air flow to the internals of the fabric interconnect. If the fans in the fan modules are inoperable, then, the temperature of the fabric interconnect may increase which would eventually lead to the malfunctioning of the fabric interconnects. Therefore, it is necessary to constantly monitor the overall status, operational state and the temperature of each fan module housed in the fabric interconnects at regular intervals. The **Fabric Interconnect Fan Modules** test helps administrators in this regard!

This test auto-discovers the fan modules of the fabric interconnects and for each fan module, this test reports the overall status, power state, operational state and the temperature of the fans. Using this test, administrators can figure out the faulty fan module and replace it before abnormalities are detected in the functioning of the fan modules.

Target of the test : A Cisco UCS Manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fan module in each fabric interconnect managed by the Cisco UCS Manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS Manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS Manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS Manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS Manager - i.e., if Cisco UCS Manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS Manager using port 80 by default, and if Cisco UCS Manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS Manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS Manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this fan module in this fabric interconnect.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the overall status of a fan module. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, ID, PID, Module, Revision, Serial Number, Tray and Vendor attributes for each fan module in the Fabric Interconnect.
</td></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this fan module in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation

State	Numeric Value
Unknown	0
Operable	1
Inoperable	2
Degraded	3
Powered-off	4
Power-problem	5
Removed	6
Voltage-problem	7
Thermal-problem	8
Performance-problem	9
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operational state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Performance state</td><td>Indicates the current performance state of this fan module in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper-non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the performance state of a fan. However, in the graph of this measure,</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Power state</td><td>Indicates the current power state of this fan module in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>On</td><td>1</td></tr><tr><td>Test</td><td>2</td></tr><tr><td>Off</td><td>3</td></tr><tr><td>Online</td><td>4</td></tr><tr><td>Offline</td><td>5</td></tr><tr><td>Offduty</td><td>6</td></tr><tr><td>Degraded</td><td>7</td></tr><tr><td>Power-save</td><td>8</td></tr><tr><td>Error</td><td>9</td></tr><tr><td>Not Available</td><td>-5</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the power state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Presence state</td><td>Indicates the current state of this fan module in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr></table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Mismatch- identity- unestablishable</td><td>21</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Thermal state</td><td>Indicates the current thermal state of this fan module in this fabric interconnect.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Ok</td><td>1</td></tr>
<tr><td>Upper- non-recoverable</td><td>2</td></tr>
<tr><td>Upper-critical</td><td>3</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Upper-non-critical</td><td>4</td></tr>
<tr><td>Lower-non-critical</td><td>5</td></tr>
<tr><td>Lower-critical</td><td>6</td></tr>
<tr><td>Lower non-recoverable</td><td>7</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the current thermal state of a fan. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Exhaust temperature</td><td>Indicates the current temperature of the fans present in this fan module in this fabric interconnect.</td><td>Celsius</td><td>Ideally, the value of this measure should be low, as an abnormal temperature can cause serious damage to the fan module.</td></tr>
</table>

3.3.5 Fabric Interconnect FC Ports Test

The Cisco UCS fabric interconnect includes the following key Fibre Channel (FC) port types:

- **Uplink FC Ports** : Uplink Fibre Channel ports handle FCoE traffic between the fabric interconnect and the next layer of the network. All network-bound FCoE traffic is pinned to one of these ports. If one/more of these ports are not operable or a traffic congestion occurs on any of these ports, then, significant latencies can be noticed in the FCoE communication between the corresponding interconnect and the network. To avoid this, you need to constantly observe the operational status, overall health, and the traffic flowing to and from each of the FC ports on every fabric interconnect, spot abnormalities quickly, and fix them before it is too late. This test enables you to do just that.
- **Storage FC Ports** : The Storage FC Port type allows for the direct attachment of a FC storage device to one of the native FC ports on the Fabric Interconnect expansion modules. Like the

FCoE Storage Port type, the FC frames arriving on these ports are expected to be un-tagged – so no connection to an MDS FC switch, etc. Each Storage FC Port is assigned a VSAN number to keep the traffic separated within the UCS Unified Fabric. When used in this way, the Fabric Interconnect is not providing any FC zoning configuration capabilities – all devices within a particular VSAN will be allowed, at least at the FC switching layer (FC2), to communicate with each other.

In addition, the fabric interconnect supports **Monitoring FC Ports**, and FC ports that have not yet been configured to perform any function and are hence still **UnConfigured FC Ports**.

The test runs frequent health checks on each of the FC ports in every fabric interconnect, and turns the spotlight on overloaded ports, non-operational ports, and ports that are operating at a slow pace.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each FC port in every fabric interconnect managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager

Parameter	Description
	communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Show Overall Status	By default, regardless of the Administrative state of an FC Port, this test reports the Overall status of that port. In other words, by default, this test reports the Overall status measure for an FC port, even if the Administrative state of that port is *Disabled*. This is because, the show overall status flag is set to **Yes** by default. If this flag is set to **No** instead, then this test will report the Overall status of only those FC ports that are currently in an Enabled Administrative state.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Administrative state	Indicates the current administrative status of this FC port in this fabric interconnect.		This measure reports either Enabled or Disabled as the administrative status a port. The states and their corresponding numeric equivalents are shown in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Enabled</td><td>1</td></tr>
<tr><td>Disbled</td><td>2</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the administrative status of an FC port. However, in the graph of this measure, states will be represented using their numeric equivalents only - i.e., 1 or 2.
</td></tr>
<tr><td>Overall status</td><td>Indicates the overall status of this FC port in this fabric interconnect.</td><td></td><td>
The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Indeterminate</td><td>0</td></tr>
<tr><td>Up</td><td>1</td></tr>
<tr><td>Admin-down</td><td>2</td></tr>
<tr><td>Link-down</td><td>3</td></tr>
<tr><td>Failed</td><td>4</td></tr>
<tr><td>No-license</td><td>5</td></tr>
<tr><td>Link-up</td><td>6</td></tr>
<tr><td>Hardware- failure</td><td>7</td></tr>
<tr><td>Software- failure</td><td>8</td></tr>
<tr><td>Error-disabled</td><td>9</td></tr>
<tr><td>Sfp-not-present</td><td>10</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned states while
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>indicating the overall status of an FC port. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.

The detailed diagnosis of this measure provides the Time, ID, Slot ID, Port Type, Network Type, Transport Type, WWPN and Mode attributes for each FC port.</td></tr>
<tr><td>Negotiated speed</td><td>Indicates the current operating speed of this FC port in this fabric interconnect.</td><td></td><td>The values reported by this measure and their corresponding numeric equivalents are described in the table below:

<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Indeterminate</td><td>0</td></tr><tr><td>1Gbps</td><td>1</td></tr><tr><td>10Gbps</td><td>2</td></tr></table>
Note:

By default, this measure reports the above-mentioned Measure Values while indicating the operational speed of an FC port. However, in the graph of this measure, the speed will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>Data received</td><td>Indicates the amount of data received by this FC port during the last measurement period.</td><td>MB</td><td rowspan="2">Compare the value of these measures across all FC ports to determine which port is handling the maximum data traffic.</td></tr>
<tr><td>Data transmitted</td><td>Indicates the amount of data sent by this FC port during the last measurement period.</td><td>MB</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
Packets received	Indicates the number of packets received by this FC port during the last measurement period.	Number	Compare the value of these measures across all FC ports to determine which port is handling the maximum packet traffic.
Packets transmitted	Indicates the number of packets transmitted by this FC port during the last measurement period.	Number	
Crc received	Indicates the number of Cyclic Redundancy Check (CRC) errors that occurred during data trafficking in this FC port, during the last measurement period.	Errors	CRC or Cyclic Redundancy Check is a process that helps in identifying any errors that might occur during the data transmission process. Data is usually transmitted in small blocks, and a CRC value is assigned to each block and transmitted along with it. This CRC value is verified at the destination to ensure that it matches the CRC value transmitted from the source. A CRC error occurs when the two values (source and destination) do not match and the test fails. The main benefit of CRC is that it helps you ensure that data you have received or downloaded is not damaged or corrupt. By comparing the value of this measure across all FC ports, you can accurately identify most error-prone FC port.
Error received	Indicates the total number of errors received by this FC port during the last measurement period.	Errors	
Error transmitted	Indicates the total number of errors transmitted by this FC port during the last measurement period.	Errors	
Discard error received	Indicates the total amount of data that was discarded	MB	

Measurement	Description	Measurement Unit	Interpretation
	during reception of data by this FC port since the last measurement period.		
Discard error transmitted	Indicates the total amount of data that was discarded during data transmission through this FC port since the last measurement period.	MB	
Too long error received	Indicates the total number of errors that occurred when data of a large size was received by this FC port during the last measurement period.	Errors	Ideally, the value of this measure should be low. A high value is indicative of many errors during data reception. To identify the most error-prone port, compare the value of this measure across FC ports.
Too short error received	Indicates the total number of errors that occurred due to truncated or corrupt data received by this FC port during the last measurement period.	Errors	Ideally, the value of this measure should be low. A high value is indicative of many errors during data transmission. To identify the most error-prone port, compare the value of this measure across FC ports.
Signal losses	Indicates the signal losses that occurred on this FC port during data transmission and reception in the last measurement period.	Errors	Ideally, the value of this measure should be 0.
Synchronize losses	Indicates the losses that occurred due to synchronization of this FC port with other components during the last measurement period.	Errors	Ideally, the value of this measure should be 0.
Link failures	Indicates the link failures that occurred between this FC port blade server chassis during the last measurement period.	Errors	Ideally, the value of this measure should be 0.

The detailed diagnosis of the *Overall status* measure provides the Time, ID, Slot ID, Port Type, Network Type, Transport Type, WWPN and Mode attributes for each FC port.

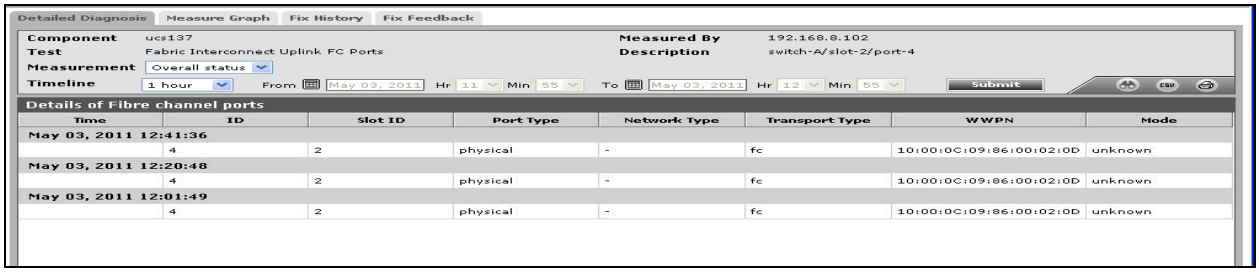

Figure 3.15: The detailed diagnosis of the Fabric Interconnect Uplink FC Ports test

3.3.6 Fabric Interconnect Details Test

Since fabric interconnects provide both network connectivity and management capabilities for the Cisco UCS system, an inoperable or resource- intensive fabric interconnect can shake the communication backbone for the blade servers and the blade server chassis of the system. Likewise, real and potential threats to the health of the interconnect hardware (eg., PSUs, mainboards, fans) can also result in significant latencies in network traffic flow over the interconnects. With the help of this test, you can keep track of the operational status and resource usage of the fabric interconnects, and also be alerted to sudden spikes in the temperature of the PSUs, mainboards, and fans supported by each interconnect.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each fabric interconnect managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.

Parameter	Description
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this fabric interconnect.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned states while indicating the overall status of a fabric interconnect. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, Name, PID, Revision, Serial Number and Vendor attributes of each fabric interconnect.
</td></tr>
<tr><td>Load</td><td>Indicates the percentage of CPU utilized by this fabric interconnect.</td><td>Percent</td><td>A high value is indicative of excessive CPU usage, and is a cause for concern.</td></tr>
<tr><td>Available memory</td><td>Indicates the amount of memory available with this fabric interconnect.</td><td>MB</td><td>A low value may indicate a memory bottleneck.</td></tr>
<tr><td>Cached memory</td><td>Indicates the memory allotted for cache (frequently used main memory locations) in this fabric interconnect.</td><td>MB</td><td></td></tr>
<tr><td>Total memory</td><td>Indicates the total memory of this fabric interconnect.</td><td>MB</td><td></td></tr>
<tr><td>Fan control inlet1</td><td>Indicates the temperature of fan 1 of this fabric interconnect.</td><td>Celsius</td><td>A low value is desired for this measure.</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
Fan control inlet2	Indicates the temperature of fan 2 of this fabric interconnect.	Celsius	A low value is desired for this measure.
Fan control inlet3	Indicates the temperature of fan 3 of this fabric interconnect.	Celsius	A low value is desired for this measure.
Fan control inlet4	Indicates the temperature of fan 4 of this fabric interconnect.	Celsius	A low value is desired for this measure.
Mainboard outlet1	Indicates the temperature of the mainboard 1 of this fabric interconnect.	Celsius	A low value is desired for this measure.
Mainboard outlet2	Indicates the temperature of the mainboard 2 of this fabric interconnect.	Celsius	A low value is desired for this measure.
PSU control inlet1	Indicates the temperature of power supply unit 1 of this fabric interconnect.	Celsius	A low value is desired for this measure.
PSU control inlet2	Indicates the temperature of power supply unit 2 of this fabric interconnect.	Celsius	A low value is desired for this measure.

The detailed diagnosis of the *Overall status* measure provides the Time, Name, PID, Revision, Serial Number and Vendor attributes of each fabric interconnect.

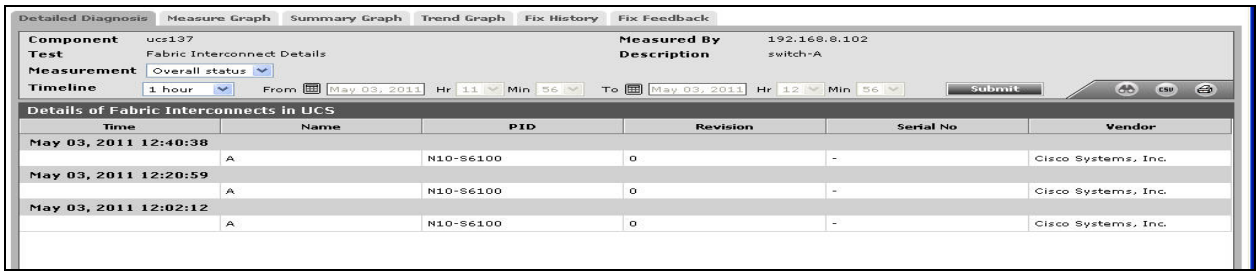

Figure 3.16: The detailed diagnosis of the Overall status measure of the Fabric Interconnect Details test

3.3.7 LAN Cloud Port Channels Test

You can aggregate a number of uplink ethernet ports by configuring them as a port channel, so traffic will forward between your upstream LAN switch and Cisco UCS fabric interconnect over the aggregate port channel ports as a single aggregated link.

This test auto-discovers the port channels configured on each Fabric Interconnect and reports the overall health, operational speed, and VLAN status of each port channel. With the help of this test, problematic and slow port channels can be identified.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each port channel configured on every fabric interconnect managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, this is NULL.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default.

Parameter	Description
	In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the current overall status of this port channel.		The values reported by this measure and their corresponding numeric values are described in the table below: **Measure Value** / **Numeric Value** Indeterminate: 0 Up: 1 Admin-down: 2 Link-down: 3 Failed: 4 No-license: 5 Link-up: 6 Hardware- failure: 7

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Software-failure</td><td>8</td></tr>
<tr><td>Error-disabled</td><td>9</td></tr>
<tr><td>Sfp-not-present</td><td>10</td></tr>
</table>

The detailed diagnosis of this measure provides the complete details of a port channel, such as, the ID of the port channel, the ID of the Fabric Interconnect for which it is configured, the Type, the Port type, the flow control policy, the transport, and the port channel name.

Note:

By default, this measure reports the above-mentioned Measure Values while indicating the overall status of a port channel. However, in the graph of this measure, port channel status will be represented using their numeric equivalents only.</td></tr>
<tr><td>Administrative state</td><td>Indicates the current administrative status of this port channel.</td><td></td><td>The values that this measure can report and the numeric values that correspond to the measure values have been detailed in the table below:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Enabled</td><td>1</td></tr>
<tr><td>Disabled</td><td>2</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Measure Values while indicating the administrative status of a port channel. However, in</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>the graph of this measure, states will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>Administrative speed</td><td>Indicates the current administrative speed of this port channel.</td><td>Number</td><td>The values that this measure can report and their corresponding numeric values are available in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>1 Gbps</td><td>1</td></tr><tr><td>10 Gbps</td><td>2</td></tr><tr><td>20 Gbps</td><td>3</td></tr><tr><td>40 Gbps</td><td>4</td></tr></table>Note:
By default, this measure reports the above-mentioned Measure Values while indicating the administrative speed of a port channel However, in the graph of this measure, speed will be represented using the corresponding numeric values only. .</td></tr>
<tr><td>Operational speed</td><td>Indicates the current operating speed of this port channel.</td><td>Number</td><td>The values reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>1 Gbps</td><td>1</td></tr><tr><td>10 Gbps</td><td>2</td></tr><tr><td>20 Gbps</td><td>3</td></tr><tr><td>40 Gbps</td><td>4</td></tr></table>Note:
By default, this measure reports the above-mentioned Measure Values</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>while indicating the operational speed of a port channel. However, in the graph of this measure, the speed will be represented using the corresponding numeric equivalents only.</td></tr>
<tr><td>VLAN status</td><td>Indicates the current VLAN status of this port channel.</td><td></td><td>The values this measure can report and their corresponding numeric values have been listed in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>OK</td><td>0</td></tr><tr><td>Missing-primary</td><td>1</td></tr></table>Note:
By default, this measure reports the above-mentioned Measure Values while indicating the VLAN status of a port channel. However, in the graph of this measure, the VLAN status will be represented using the corresponding numeric equivalents only.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure provides the complete details of a port channel, such as, the ID of the port channel, the ID of the Fabric Interconnect for which it is configured, the Type, the Port type, the flow control policy, the transport, and the name.

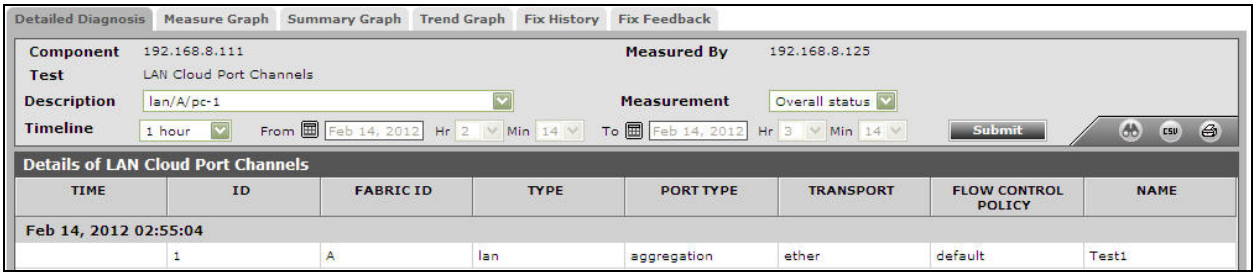

Figure 3.17: The detailed diagnosis of the Overall status measure of the LAN Cloud Port Channels Test

3.3.8 LAN Cloud PC Ethernet Ports

You can aggregate a number of uplink ethernet ports by configuring them as a port channel, so traffic will forward between your upstream LAN switch and Cisco UCS fabric interconnect over the aggregate port channel ports as a single aggregated link.

This test auto-discovers the Ethernet ports aggregated in each port channel on every Fabric Interconnect and reports the overall health, operational speed, and VLAN status of each Ethernet port. With the help of this test, problematic and slow ports can be identified.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each Ethernet port in each port channel configured on every fabric interconnect managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, this is NULL.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default.

Parameter	Description
	In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the current overall status of this port.		The values reported by this measure and their corresponding numeric values are described in the table below: **Measure Value** / **Numeric Value** Unknown – 0 Up – 1 Down – 2 Error- mis-configured – 3 The detailed diagnosis of this measure provides the complete details of a port, such as, the ID of the port, the slot ID, the Fabric Interconnect for which the port has been configured, the Type, the Port type, the flow control policy, the

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>transport, and the port, locale, and name.
Note:
By default, this measure reports the above-mentioned Measure Values while indicating the overall status of a port. However, in the graph of this measure, port status will be represented using their numeric equivalents only.</td></tr>
<tr><td>Administrative state</td><td>Indicates the current administrative status of this port.</td><td></td><td>The values that this measure can report and the numeric values that correspond to the measure values have been detailed in the table below:
<table><tr><th>Numeric Value</th><th>Measure Value</th></tr><tr><td>Enabled</td><td>1</td></tr><tr><td>Disabled</td><td>2</td></tr></table>
Note:
By default, this measure reports the above-mentioned Measure Values while indicating the administrative status of a port. However, in the graph of this measure, states will be represented using the corresponding numeric equivalents only.</td></tr>
</table>

The detailed diagnosis of the *Overall status* measure provides the complete details of a port, such as, the ID of the port, the slot ID, the Fabric Interconnect for which the port has been configured, the Type, the Port type, the flow control policy, the transport, and the port, locale, and name.

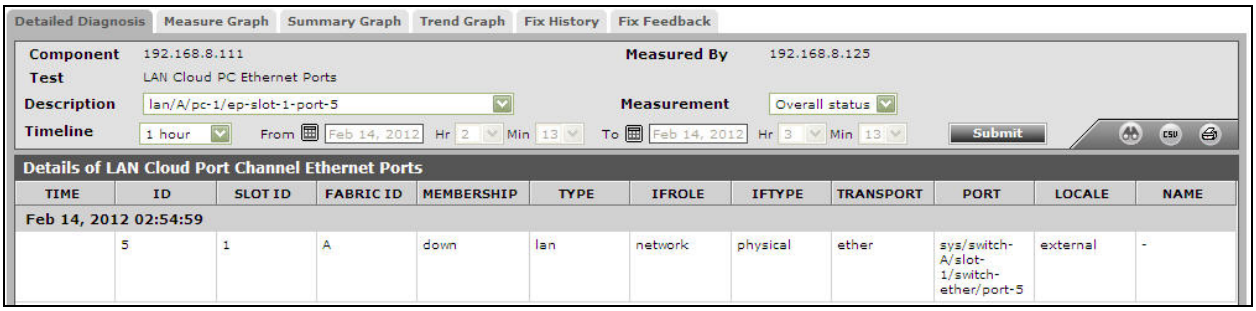

Figure 3.18: The detailed diagnosis of the Overall Status measure of the LAN Cloud PC Ethernet Ports test

3.4 The Blades Layer

The Cisco UCS B-Series Blade Servers are crucial building blocks of the Cisco Unified Computing System, delivering scalable and flexible computing for a datacenter.

The Cisco UCS B-Series Blade Servers are based on industry-standard server technologies and provide:

- Up to two Intel Xeon Series 5500 multicore processors
- Two optional front-accessible, hot-swappable SAS hard drives
- Support for up to two dual-port mezzanine card connections for up to 40 Gbps of redundant I/O throughput
- Industry-standard double-data-rate 3 (DDR3) memory
- Remote management through an integrated service processor that also executes policies established in Cisco UCS Manager software
- Local keyboard, video, and mouse (KVM) access through a front console port on each server
- Out-of-band access by remote KVM, Secure Shell (SSH) Protocol, and virtual media (vMedia) as well as Intelligent Platform Management Interface (IPMI)

Since these blade servers are the heart of the Cisco UCS system, even a brief non-availability or non-operability of these servers, or sporadic hardware-related issues they encounter, will have an adverse impact on the overall performance of the Cisco UCS system. Using the tests mapped to this layer, administrators can closely observe the changes in the status of the blade servers, and promptly detect deviations, so that the problems can be resolved before they affect the Cisco UCS system as a whole.

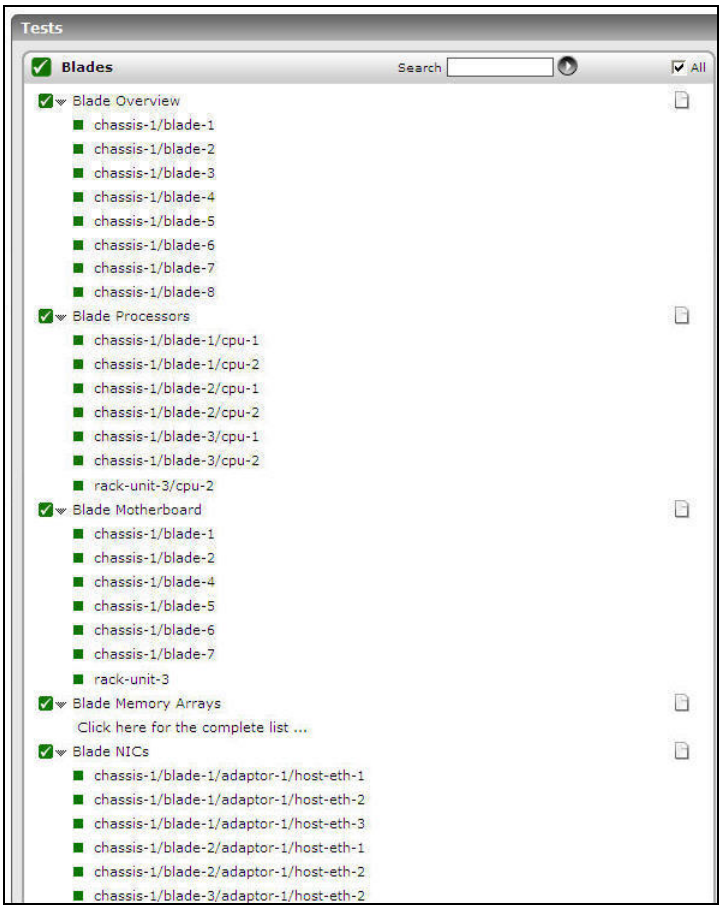

Figure 3.19: The tests mapped to the Blades layer

3.4.1 Blade Overview Test

Blade servers are the core components of the Cisco UCS system. Unavailable/inoperable blade servers can hence bring the entire system to a standstill. Using this test, you can continuously monitor the overall health, operability, and availability of each blade server in each chassis managed by the Cisco UCS manager, and be alerted to anomalies as soon as they occur, so that you can take the required corrective actions before your mission-critical services begin to suffer. In addition, the test also captures critical power and thermal failures experienced by the blade servers, and takes stock of the hardware (such as processors, cores, NICs, etc.) supporting the operations of the blade server.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each blade server in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the overall status of this blade server in this chassis.		The States reported by this measure and their corresponding numeric equivalents are described in the table below:

State	Numeric Value
Indeterminate	0
Unassociated	1
Ok	10
Discovery	11
Config	12
Unconfig	13
Power-off	14
Restart	15
Maintenance	20
Test	21
Compute- mis-match	29
Compute-failed	30
Degraded	31
Discovery-failed	32
Config-failure	33
Unconfig-failed	34
Test-failed	35
Maintenance-failed	36
Removed	40

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Disabled</td><td>41</td></tr>
<tr><td>Inaccessible</td><td>50</td></tr>
<tr><td>Thermal-problem</td><td>60</td></tr>
<tr><td>Power-problem</td><td>61</td></tr>
<tr><td>Voltage-problem</td><td>62</td></tr>
<tr><td>Inoperable</td><td>63</td></tr>
<tr><td>Decomissioning</td><td>101</td></tr>
<tr><td>Bios-restore</td><td>201</td></tr>
<tr><td>Cmos-reset</td><td>202</td></tr>
<tr><td>Diagnostics</td><td>203</td></tr>
<tr><td>Diagnostics-failed</td><td>204</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned states while indicating the overall status of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
The detailed diagnosis of this measure provides the Time, Slot ID, chassis ID, PID, Revision, Serial Number, Vendor, Name, UUID, Service Profile and Original UUID attributes for this blade server.
</td></tr>
<tr><td>Administrative state</td><td>Indicates the current administrative state of this blade server loaded in this chassis.</td><td></td><td>This measure reports either In-service or Out-of-service as the adminstrative state of the blade servers. The numeric equivalents corresponding to these states are shown in the table below:</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>In-service</td><td>1</td></tr>
<tr><td>Out-of-service</td><td>2</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned states while indicating the administrative state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Association state</td><td>Indicates the current associative state of this blade server loaded in this chassis i.e., indicates whether the blade server is associated with the service profile that is preconfigured in the Cisco UCS Manager.</td><td></td><td>A service profile represents a logical view of a single blade server, without needing to know exactly which blade you are talking about. The profile object contains the server personality (identity and network information). The profile can then be associated with a single blade at a time.
Cisco UCS Manager uses service profiles to provision the blade servers and their I/O properties. The Cisco Unified Computing System has a form factor-neutral architecture, allowing administrators to centrally manage Cisco UCS blade servers or rack-mount servers, or incorporate both within a single management domain.
Service profiles are created by server, network, and storage administrators and are stored in the Cisco UCS Fabric Interconnects. Infrastructure policies needed to deploy applications, such as power and cooling, security, identity, hardware health, and Ethernet and</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>storage networking, are encapsulated in the service profile. The policies coordinate and automate element management at every layer of the hardware stack, including RAID levels, BIOS settings, firmware revisions and settings, adapter identities and settings, VLAN and VSAN network settings, network quality of service (QoS), and data center connectivity. Cisco UCS Manager provides granular Cisco Unified Computing System visibility for higher-level management tools from BMC, CA, HP, IBM, and others, providing exceptional alignment of infrastructure management with OS and application requirements.

This measure reports the associative state of the blade servers and their numeric equivalents as shown in the table:

<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>None</td><td>0</td></tr><tr><td>Associated</td><td>1</td></tr><tr><td>Removing</td><td>2</td></tr><tr><td>Failed</td><td>3</td></tr></table>
Note:

By default, this measure reports the above-mentioned states while indicating the associative state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Availability state</td><td>Indicates the current availability status of this</td><td>MB</td><td>This measure reports either Available or Unavailable as the availability status of</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>blade server in this chassis.</td><td></td><td>the blade servers. The states and their corresponding numeric equivalents are shown in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unavailable</td><td>0</td></tr><tr><td>Available</td><td>1</td></tr></table>
Note:
By default, this measure reports the above-mentioned states while indicating the availability state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Checkpoint state</td><td>Indicates the current checkpoint status of this blade server loaded in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Removing</td><td>1</td></tr><tr><td>Shallow- checkpoint</td><td>2</td></tr><tr><td>Deep- checkpoint</td><td>3</td></tr><tr><td>Discovered</td><td>4</td></tr></table>
Note:
By default, this measure reports the above-mentioned states while indicating the checkpoint state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Discovery state</td><td>Indicates the current</td><td></td><td>The States reported by this measure and</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>discovery status of this blade server loaded in this chassis.</td><td></td><td>their corresponding numeric equivalents are described in the table below:

<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Undiscovered</td><td>0</td></tr><tr><td>In-progress</td><td>1</td></tr><tr><td>Malformed- fru-ino</td><td>2</td></tr><tr><td>Fru-not-ready</td><td>3</td></tr><tr><td>Insufficiently-equipped</td><td>4</td></tr><tr><td>Failed</td><td>8</td></tr><tr><td>Complete</td><td>16</td></tr><tr><td>Retry</td><td>32</td></tr><tr><td>Throttled</td><td>64</td></tr><tr><td>Illegal-fru</td><td>128</td></tr><tr><td>Fru- identity-indeterminate</td><td>129</td></tr><tr><td>Fru- state- indeterminate</td><td>130</td></tr><tr><td>Diagnostics- in-progress</td><td>131</td></tr><tr><td>Efidiagnostics-in-progress</td><td>132</td></tr><tr><td>Diagnostics-failed</td><td>133</td></tr><tr><td>Diagnostics-complete</td><td>134</td></tr></table>
Note:

By default, this measure reports the above-mentioned States while indicating the discovery state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Operability</td><td>Indicates the current operating state of this blade server loaded in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
<tr><td>Removed</td><td>6</td></tr>
<tr><td>Voltage-problem</td><td>7</td></tr>
<tr><td>Thermal-problem</td><td>8</td></tr>
<tr><td>Performance-problem</td><td>9</td></tr>
<tr><td>Accessibility-problem</td><td>10</td></tr>
<tr><td>Identity-unestablishable</td><td>11</td></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric-unsupported-conn</td><td>52</td></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
Note:
By default, this measure reports the above-mentioned States while indicating the operational state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Power state</td><td>Indicates the current power status of this blade server loaded in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table>
<tr><th>State</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>On</td><td>1</td></tr>
<tr><td>Test</td><td>2</td></tr>
<tr><td>Off</td><td>3</td></tr>
<tr><td>Online</td><td>4</td></tr>
<tr><td>Offline</td><td>5</td></tr>
<tr><td>Offduty</td><td>6</td></tr>
<tr><td>Degraded</td><td>7</td></tr>
<tr><td>Power-save</td><td>8</td></tr>
<tr><td>Error</td><td>9</td></tr>
<tr><td>Not-supported</td><td>100</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>Note:
By default, this measure reports the above-mentioned States while indicating the power state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Slot state</td><td>Indicates the current slot status of this blade server loaded in this chassis.</td><td></td><td>The States reported by this measure and their corresponding numeric equivalents are described in the table below:
<table><tr><th>State</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Empty</td><td>1</td></tr><tr><td>Equipped</td><td>10</td></tr><tr><td>Missing</td><td>11</td></tr><tr><td>Mismatch</td><td>12</td></tr><tr><td>Equipped- not-primary</td><td>13</td></tr><tr><td>Equipped- identity- unestablishable</td><td>20</td></tr><tr><td>Mismatch- identity- unestablishable</td><td>21</td></tr><tr><td>Inaccessible</td><td>30</td></tr><tr><td>Unauthorized</td><td>40</td></tr></table>
Note:
By default, this measure reports the above-mentioned States while indicating the slot state of a blade server. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Effective memory</td><td>Indicates the amount of</td><td>MB</td><td>Ideally, the value of this measure should be high.</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
	memory that can be effectively used by this blade server present in this chassis.		
Total memory	Indicates the total memory available in this blade server present in this chassis.	MB	
Number of processors	Indicates the number of Central Proccessor Units available in this blade server loaded in this chassis.	Number	
Number of cores	Indicates the total number of cores available on all the CPS that are installed in this blade server in this chassis.	Number	
Number of cores enabled	Indicates the number of core processors that are enabled in this blade server in this chassis.	Number	
Number of threads	Indicates the number of processes that can run simultaneously on this blade server in this chassis.	Number	This measures should be equal to either the number of cores or twice the number of cores if the operating system supports hyperthreading.
Number of adapters	Indicates the number of adapters available in this blade server in this chassis.	Number	
Number of NICs	Indicates the number of physical ethernet network interface cards (NICs) available in this blade server in this chassis.	Number	

Measurement	Description	Measurement Unit	Interpretation
Number of HBAs	Indicates the number of physical host bus adapters (HBAs) available in the blade servers.	Number	

3.4.2 Blade Processors Test

The Cisco UCS B-Series Blade Servers support up to two Intel Xeon Series 5500 multicore processors. If the temperature of a processor suddenly soars or a high voltage of current unexpectedly flows through a processor, it can damage one/more internal components of the processor, thereby suspending not only the processor's operations, but also that of the blade server depending on it. It is hence imperative to keep tabs of the temperature and current changes experienced by each of the processors of a blade server. Using this test, you can periodically check the temperature and input current of each of the processors supported by a blade server, and promptly detect abnormalities (if any).

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each processor supported by every blade server in each chassis being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if

Parameter	Description
	not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
CPU temperature	Indicates the current temperature of this processor.	Celsius	A low value is ideal for this measure. A sudden and significant increase in this value could be a cause for concern.
Input current	Indicates the input current received by this processor.	Amps	Ideally, the value of this measure should be low. A sudden, yet significant increase in this value could inflict injury on the internal components of the processor.

3.4.3 Blade Motherboard Test

Issues in the motherboard can have an adverse impact on the performance levels delivered by a blade server. This test monitors the health of the motherboard of each blade server loaded in each chassis managed by a Cisco UCS manager, and reveals the following:

- Is the motherboard consuming power excessively?
- Are the current and voltage inputs received by the motherboard in excess of its capacity?
- Are the temperatures in the front and rear panels of the motherboard normal?
- If the temperature of the rear panel is very high, then which rear panel is contributing to this abnormality - the left or the right rear panel?

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each blade server loaded in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Consumed power	Indicates the total power consumed by the	Watts	An unusually high value could be a cause for concern.

Measurement	Description	Measurement Unit	Interpretation
	motherboard of this blade server.		
Input current	Indicates the input current received by the motherboard of this blade server.	Amps	Ideally, the value of this measure should be low. A sudden, yet significant increase in this value could inflict injury on the motherboard.
Input voltage	Indicates the input voltage received by the motherboard of this blade server.	Volts	Ideally, the value of this measure should be low. A sudden, yet significant increase in this value could inflict injury on the motherboard.
Front temperature	Indicates the temperature of the front panel of the motherboard of this blade server.	Celsius	A very high temperature indicates that the motherboard is overheated.
Rear temperature	Indicates the temperature of the rear panel of the motherboard of this blade server.	Celsius	A very high temperature indicates that the motherboard is overheated.
Rear temperature right	Indicates the temperature of the right rear panel of the motherboard of this blade server.	Celsius	A very high temperature indicates that the motherboard is overheated.
Rear temperature left	Indicates the temperature of the left rear panel of the motherboard of this blade server.	Celsius	A very high temperature indicates that the motherboard is overheated.

3.4.4 Blade Memory Arrays Test

This test monitors the temperature of each of the memory arrays of the blade servers loaded in a chassis, and reports any abnormal increase in temperature.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each memory array of every blade server loaded in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Array temperature	Indicates the current temperature of the memory array present in this blade server.	Celsius	A very high temperature could indicate that the memory array is overheated.

3.4.5 Blade NICs Test

This test auto-discovers the NICs (Network Interface Cards) supported by the UCS Blade servers, monitors the overall health, operational state, and load on each NIC, and promptly notifies administrators when an NIC suddenly switches to an abnormal state, becomes overloaded, or encounters errors while sending/receiving data over the network. This way, you can easily isolate problematic, over-used, and error-prone NICs.

Target of the test : A Cisco UCS manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each NIC supported by every blade server loaded in each chassis managed by the Cisco UCS manager being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	The IP address of the host for which the test is being configured.
Port	The variable name of the port at which the specified host listens.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS manager.
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
Web Port	By default, in most virtualized environments, Cisco UCS manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS manager - i.e., if Cisco UCS manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS manager using port 80 by default, and if Cisco UCS manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the

Parameter	Description
	Cisco UCS manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS manager.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Overall status	Indicates the current state of this NIC.		The values reported by this measure and their corresponding numeric values are described in the table below: Measure Value / Numeric Value Unknown 0 Operable 1 Inoperable 2 Degraded 3 Powered off 4 Power-problem 5 Removed 6 Voltage-problem 7 Thermal-problem 8 Performance- 9

Measurement	Description	Measurement Unit	Interpretation

Measure Value	Numeric Value
problem	
Accessibility-problem	10
Identity-unestablishable	11
Bios-post-timeout	12
Disabled	13
Fabric-conn-problem	51
Fabric-unsupported-conn	52
Config	81
Equipment-problem	82
Decommissioning	83
Chassis-limit-exceeded	84
Discovery	101
Discovery-failed	102
Identify	103
Post-failure	104
Upgrade-problem	105
Peer-comm-problem	106
Auto-upgrade	107
Not Available	-5

The detailed diagnosis of this measure provides the complete details of an NIC such as its ID, Vendor, vNIC, PCIE Address, MAC, Original MAC, Purpose, Name, and Type.

Note:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>By default, this measure reports the Measure Values listed in the table above to indicate the overall state of an NIC. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.</td></tr>
<tr><td>Operability</td><td>Indicates the current operational state of this NIC.</td><td></td><td>The values reported by this measure and their corresponding numeric values are described in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Operable</td><td>1</td></tr>
<tr><td>Inoperable</td><td>2</td></tr>
<tr><td>Degraded</td><td>3</td></tr>
<tr><td>Powered-off</td><td>4</td></tr>
<tr><td>Power-problem</td><td>5</td></tr>
<tr><td>Removed</td><td>6</td></tr>
<tr><td>Voltage-problem</td><td>7</td></tr>
<tr><td>Thermal-problem</td><td>8</td></tr>
<tr><td>Performance-problem</td><td>9</td></tr>
<tr><td>Accessibility-problem</td><td>10</td></tr>
<tr><td>Identity-unestablishable</td><td>11</td></tr>
<tr><td>Bios-post-timeout</td><td>12</td></tr>
<tr><td>Disabled</td><td>13</td></tr>
<tr><td>Fabric-conn-problem</td><td>51</td></tr>
<tr><td>Fabric-unsupported-conn</td><td>52</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Config</td><td>81</td></tr>
<tr><td>Equipment-problem</td><td>82</td></tr>
<tr><td>Decommissioning</td><td>83</td></tr>
<tr><td>Chassis-limit-exceeded</td><td>84</td></tr>
<tr><td>Discovery</td><td>101</td></tr>
<tr><td>Discovery-failed</td><td>102</td></tr>
<tr><td>Identify</td><td>103</td></tr>
<tr><td>Post-failure</td><td>104</td></tr>
<tr><td>Upgrade-problem</td><td>105</td></tr>
<tr><td>Peer-comm-problem</td><td>106</td></tr>
<tr><td>Auto-upgrade</td><td>107</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the Measure Values listed in the table above to indicate the operational state of an NIC. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Administrative state</td><td>Indicates the current administrative state of this NIC.</td><td></td><td>The values reported by this measure and their corresponding numeric values are described in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Enabled</td><td>0</td></tr>
<tr><td>Reset-connectivity-active</td><td>1</td></tr>
</table>
</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Reset-connectivity-passive</td><td>2</td></tr><tr><td>Reset-connectivity</td><td>3</td></tr></table> **Note:** By default, this measure reports the **Measure Value**s listed in the table above to indicate the administrative state of an NIC. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
Discovery state	Indicates the current discovery state of this NIC.		The values reported by this measure and their corresponding numeric values are described in the table below: <table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Absent</td><td>0</td></tr><tr><td>Present</td><td>1</td></tr><tr><td>Mis-connect</td><td>2</td></tr><tr><td>Missing</td><td>3</td></tr><tr><td>New</td><td>4</td></tr></table> **Note:** By default, this measure reports the **Measure Value**s listed in the table above to indicate the discovery state of an NIC. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
Presence state	Indicates the current presence state of this NIC.		The values reported by this measure and their corresponding numeric values are described in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Unknown</td><td>0</td></tr>
<tr><td>Empty</td><td>1</td></tr>
<tr><td>Equipped</td><td>10</td></tr>
<tr><td>Missing</td><td>11</td></tr>
<tr><td>Mismatch</td><td>12</td></tr>
<tr><td>Equipped- not-primary</td><td>13</td></tr>
<tr><td>Equipped- identity- unestablishable</td><td>20</td></tr>
<tr><td>Mismatch- identity- unestablishable</td><td>21</td></tr>
<tr><td>Inaccessible</td><td>30</td></tr>
<tr><td>Unauthorized</td><td>40</td></tr>
<tr><td>Not Available</td><td>-5</td></tr>
</table>
Note:
By default, this measure reports the Measure Values listed in the table above to indicate the presence state of an NIC. However, in the graph of this measure, states will be represented using their corresponding numeric equivalents only.
</td></tr>
<tr><td>Data received</td><td>Indicates the amount of data received by this NIC during the last measurement period.</td><td>MB</td><td rowspan="2">These measures are good indicators of the load bandled by an NIC. By comparing the value of each measure across NICs, you can quickly identify which NIC is experiencing heavy data traffic and when - while receiving data? or while transmitting data?</td></tr>
<tr><td>Data transmitted</td><td>Indicates the amount of data transmitted by this NIC during the last measurement period.</td><td>MB</td></tr>
<tr><td>Packets received</td><td>Indicates the number of packets received by this</td><td>Packets</td><td>These measures are good indicators of the load bandled by an NIC. By</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
	NIC during the last measurement period.		comparing the value of each measure across NICs, you can quickly identify which NIC is experiencing heavy data traffic and when - while receiving data? or while transmitting data?
Packets transmitted	Indicates the number of packets sent by this NIC during the last measurement period.	Packets	
Dropped packets received	Indicates the number of dropped packets received by this NIC during the last measurement period.	Packets	
Dropped packets transmitted	Indicates the number of dropped packets transmitted by this NIC during the last measurement period.	Packets	
Errors received	Indicates the errors encountered by this NIC while receiving data during the last measurement period.	Errors	Ideally, the value of both these measures should be 0. A non-zero value indicates that one/more errors have occurred on an NIC. If these measure values increase with time, you may want to compare the value of each of these measures across NICs to quickly zero-in on the error-prone NICs and understand when the maximum number of errors occurred on those NICs - while transmitting data? or while receiving it?
Errors transmitted	Indicates the errors encountered by this NIC while transmitting data during the last measurement period.	Errors	

3.4.6 Memory Array Errors Test

A DIMM or dual in-line memory module comprises a series of dynamic random-access memory integrated circuits. The Cisco UCS Manager may comprise of multiple DIMMs that server as the main source of memory for the blade servers hosted on the Cisco UCS Manager. The functioning of

the blade servers depends extensively on the DIMMs. When errors are detected on the DIMMs, the blade servers would be the first to get affected. The errors on the DIMMs may occur due to the following reasons:

- Use of third-party DIMMs which are not certified by Cisco;
- When the DIMM is not oriented correctly in the slot;
- When the DIMM is reported as unrecognized/inoperable/degraded/overheating;

The memory errors encountered by the Cisco UCS Manager are classified as follows:

- Correctable and Uncorrectable Errors
- Detected and Undetected Errors
- Hard and Soft Errors

These errors when left unattended may result in the failure of some virtual servers hosted on the blade servers of the Cisco UCS Manager and in the worst case may result in the failure of the blade servers itself! To avoid such casualties, it is necessary to monitor the errors detected on the Cisco UCS Manager and rectify the same before end users start complaining about the blade servers being inaccessible. The **Memory Array Errors** test helps in this regard!

This test continuously tracks the memory errors occurring in the DIMM of the Cisco UCS Manager and reports the number of memory errors that occurred during various time slots. By regularly analyzing the metrics reported by this test, administrators can determine when exactly the error occurrence was high and troubleshoot the memory issues better.

Target of the test : A Cisco UCS Manager

Agent deploying the test : A remote agent

Outputs of the test : One set of results for the Cisco UCS Manager that is being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which the test is being configured.
Port	The port at which the specified host listens. By default, it is set to *NULL*.
UCS User and UCS Password	Provide the credentials of a user with at least *read-only* privileges to the target Cisco UCS Manager.

Parameter	Description
Confirm Password	Confirm the password by retyping it here.
SSL	By default, the Cisco UCS Manager is SSL-enabled. Accordingly, the SSL flag is set to **Yes** by default.
WebPort	By default, in most virtualized environments, Cisco UCS Manager listens on port 80 (if not SSL-enabeld) or on port 443 (if SSL-enabled) only. This implies that while monitoring Cisco UCS Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Cisco UCS Manager - i.e., if Cisco UCS Manager is not SSL-enabled (i.e., if the SSL flag above is set to **No**), then the eG agent connects to Cisco UCS Manager using port 80 by default, and if Cisco UCS Manager is SSL-enabled (i.e., if the SSL flag is set to **Yes**), then the agent-Cisco UCS Manager communication occurs via port 443 by default. Accordingly, the WebPort parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WebPort parameter, you can specify the exact port at which the Cisco UCS Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Cisco UCS Manager.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Errors in last minute	Indicates the number of errors encountered during the last minute.	Number	Ideally, the value of this measure should be zero. A gradual/sudden increase in the value of this measure is a cause for concern.
Errors in last 15 minutes	Indicates the number of errors encountered during the past 15 minutes.	Number	
Errors in last 1 hour	Indicates the number of errors encountered during the last 1 hour.	Number	
Errors in last day	Indicates the number of errors encountered during the last 1 day.	Number	
Errors in last week	Indicates the number of errors encountered during the last 1 week.	Number	

Measurement	Description	Measurement Unit	Interpretation
Errors in last 2 weeks	Indicates the number of errors encountered during the last 2 weeks.	Number	Ideally, the value of this measure should be zero.

About eG Innovations

eG Innovations provides intelligent performance management solutions that automate and dramatically accelerate the discovery, diagnosis, and resolution of IT performance issues in on-premises, cloud and hybrid environments. Where traditional monitoring tools often fail to provide insight into the performance drivers of business services and user experience, eG Innovations provides total performance visibility across every layer and every tier of the IT infrastructure that supports the business service chain. From desktops to applications, from servers to network and storage, from virtualization to cloud, eG Innovations helps companies proactively discover, instantly diagnose, and rapidly resolve even the most challenging performance and user experience issues.

eG Innovations is dedicated to helping businesses across the globe transform IT service delivery into a competitive advantage and a center for productivity, growth and profit. Many of the world's largest businesses use eG Enterprise to enhance IT service performance, increase operational efficiency, ensure IT effectiveness and deliver on the ROI promise of transformational IT investments across physical, virtual and cloud environments.

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