Sun Servers Integration 1.1 for IBM Director

This publication describes how to use the Sun Servers Integration 1.1 for IBM Director.

A complete list of currently supported Sun servers, service processors, and service processor firmware is available at the following web site:

http://www.sun.com/system-management/tools.jsp

Please consult this web site before configuring the Sun Servers Integration 1.1 for IBM Director.

Sun Microsystems, Inc.

www.sun.com

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Contents

Introduction

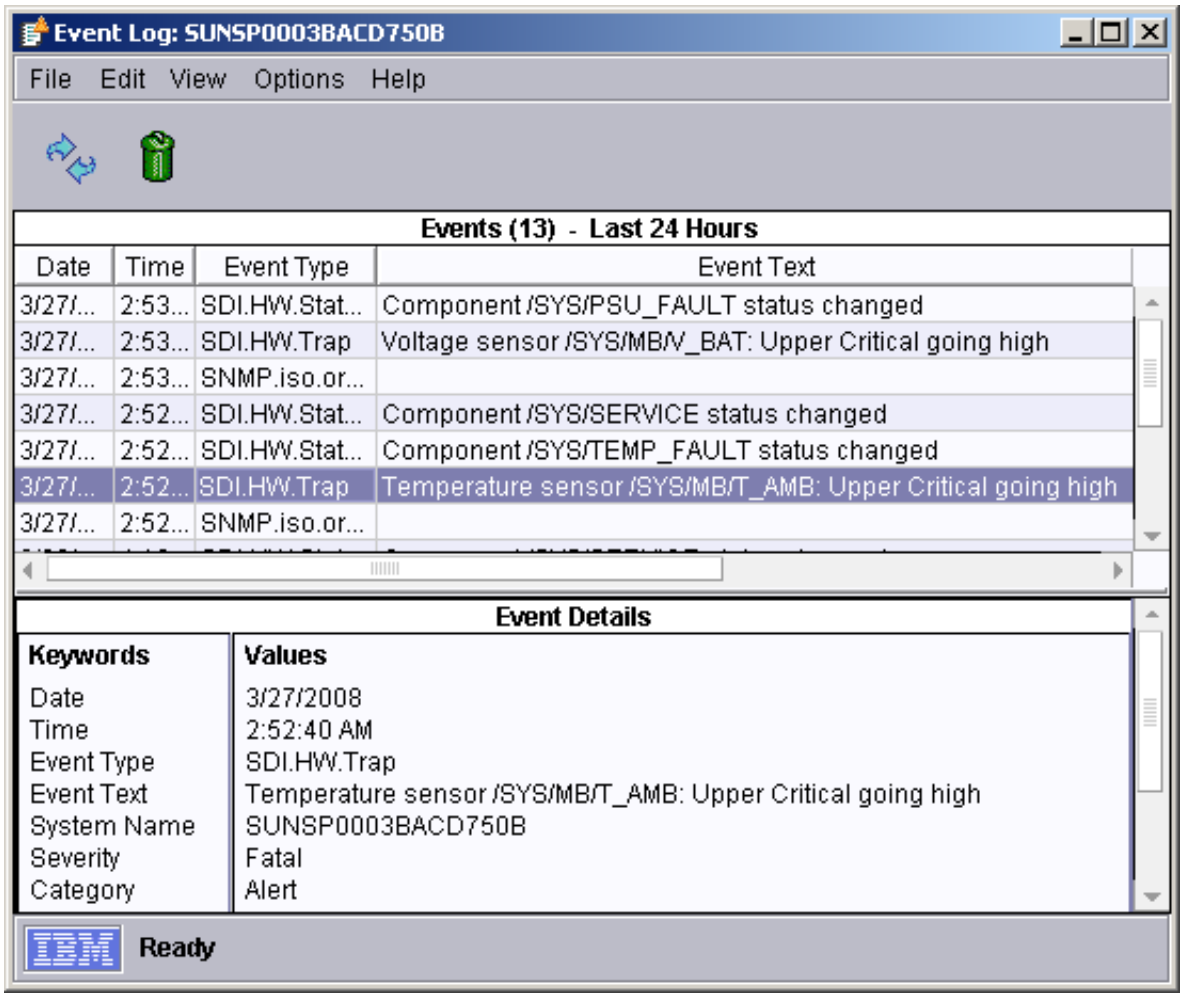
This topic provides an introduction to the Sun Servers Integration 1.1 for IBM Director.

IBM® Director Version 5.20 (hereafter IBM Director) is an integrated suite of tools designed to provide comprehensive system management capabilities in your data center. The Sun Integration Pack extends the capabilities of IBM Director 5.20 by providing Sun-specific configuration information and diagnostic information.

Once you have installed and configured the Sun Servers Integration 1.1 for IBM Director, you will be able to take advantage of the following Sun-specific features in IBM Director.

- Supported Sun servers appear as SNMP devices in IBM Director once the Sun Integration Pack is installed and IBM Director discovers the Sun servers to be monitored.
- IBM Director clearly identifies traps from Sun x64/ILOM, SPARC/ILOM (MASF), x64/EmbeddedLOM, and SPARC/ALOM(MASF) servers and service processors by the following:
  - *Source*: the monitored SNMP device
  - *Event type*: `SDI.Hw.Trap`
  - *Severity*: the standard IBM Director levels and settings.
  - *Event descriptions*: human-readable text interpreting the trap
- The default IBM Director Hardware Status monitoring is enhanced by Sun Integration Pack server health monitoring. The Sun Integration Pack builds and maintains a model of its overall server health and reports that to the IBM Director Hardware Status component. The scope of this health monitoring depends on the Sun device being monitored:
  - *ILOM- and MASF-based devices*: The Sun Integration Pack monitors a set of system LED indicators. You can customize the way the Sun Integration Pack interprets these indicators in a configuration file named `SDIIndicators.properties`.
  - *EmbeddedLOM devices*: The Sun Integration Pack monitors a set of system sensors in order to build a summary picture of server health.

Once you have installed and configured the Sun Integration Pack, IBM Director displays traps received from multiple types of Sun servers and Sun-specific information about those traps, for example event severity. The following screen shot depicts SNMP traps from an x64/ILOM (Sun Fire X4200 M2) service processor as interpreted by the Sun Integration Pack.



Categories of Sun Servers

Sun Servers Integration 1.1 for IBM Director is one of several Sun ISV System Management solutions that provides Sun-specific resources for monitoring Sun servers in enterprise or workgroup data centers.

All the Sun servers supported by these integration packs fall into four categories differentiated by architecture (x64 or SPARC) and by service processor type (ALOM, ILOM, or Embedded LOM). The integration pack that you are installing or the configuration that you are implementing may not support all categories of servers, so consult the following website to verify that a particular server in one of these categories is supported by Sun Servers Integration 1.1 for IBM Director:

http://www.sun.com/systemmanagement/tools.jsp

Category	Supported	Description
x64 Servers with ILOM	Yes	x64 servers and blade server modules with the Integrated Lights Out Manager (ILOM) service processor. Hereafter referenced as x64/ILOM servers. These servers are monitored at either the service processor level or at the operating system level via the Sun Server Hardware Management Pack.

Category	Supported	Description
SPARC Servers with ILOM	Yes	SPARC Solaris servers and blade server modules with the Integrated Lights Out Manager (ILOM) service processor. Hereafter referenced as SPARC/ILOM servers. These servers can be monitored at either the service processor level or at the operating system level via the Sun SNMP Management Agent for Sun Fire and Netra Systems.
x64 Servers with Embedded LOM	Yes	x64 servers and blade server modules with the Embedded Lights Out Manager (Embedded LOM) service processor. Hereafter referenced as x64/EmbeddedLOM servers. These servers are monitored at the service processor level.
SPARC Servers with ALOM	Yes	SPARC Solaris servers with the Advanced Lights Out Manager (ALOM) service processor Hereafter referenced as SPARC/ALOM servers. These servers are monitored at the operating system level via the Sun SNMP Management Agent for Sun Fire and Netra Systems.

The matrix of servers and service processors supported by Sun integration packs is expanding dynamically. A complete, current list of supported Sun servers, service processors, and service processor firmware is available at the following web site:

http://www.sun.com/systemmanagement/tools.jsp

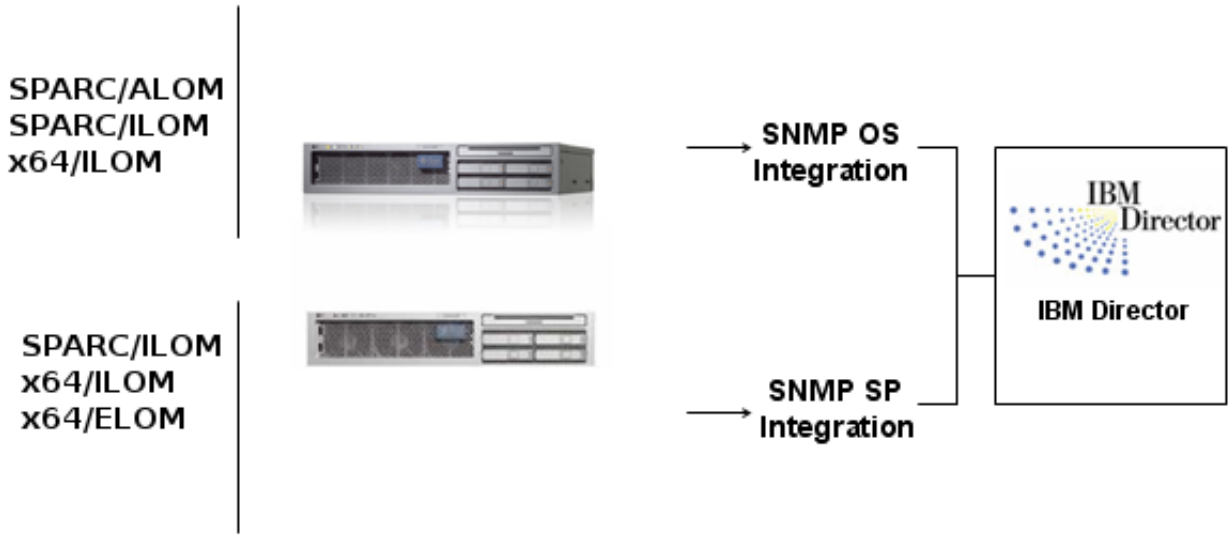
Please consult this web site before performing installation and/or configuration of the Sun Servers Integration 1.1 for IBM Director.

Levels of Integration with IBM Director

This topic provides an overview of your options for integrating various types of Sun servers with IBM Director.

The Sun Integration Pack uses SNMP as its integration protocol at both the operating system and service processor level. No IBM Director agents need to be installed on any Sun server for this integration to work. Your options for integration derive from the types of Sun servers that you plan to integrate with IBM Director. Sun x64/ILOM, x64/EmbeddedLOM, and SPARC/ALOM servers support only one level of integration; Sun SPARC/ILOM and x64/ILOM servers support two.

To implement SNMP integration at either the operating system or service processor level, you must verify that monitored devices are configured with the appropriate port and server information so they can communicate with the server running IBM Director.



Operating System Integration

You can integrate SPARC/ALOM and SPARC/ILOM servers with IBM Director at the operating system level via the Sun SNMP Management Agent for Sun Fire and Netra Systems. You can integrate x64/ILOM servers with IBM Director at the operating system level via the Sun Server Hardware Management Pack.

Servers	Description
SPARC/ILOM Servers SPARC/ALOM Servers	The Sun SNMP Management Agent for Sun Fire and Netra Systems must be installed on SPARC/Solaris systems to enable operating system integration and must be configured to send traps/alerts to the server on which IBM Director is installed and running (with proper SNMP port information).
x64/ILOM	The Sun Server Hardware Management Pack must be installed on a Sun x64 Server with compatible operating system.

Service Processor Integration

You can integrate x64/ILOM, x64/EmbeddedLOM, and SPARC/ILOM servers at the service processor level.

Note: Sun recommends that you upgrade the firmware on your service processors to the latest version supported by this integration.

Servers	Description
x64/ILOM and SPARC/ILOM Servers	The ILOM service processor sends IBM Director SNMP traps defined by the following SNMP MIB: • `SUN-HW-TRAP-MIB` To enable this integration, you do not need to install any IBM Director-specific agents on the monitored devices. You do need to configure SNMP on the managed device so that the host running IBM Director is one of its SNMP trap destinations.
x64/EmbeddedLOM Servers	The EmbeddedLOM service processor sends IBM Director SNMP traps defined by the following SNMP MIB:

Servers	Description
	• `SUN-ILOM-PET-MIB` To enable this integration, you do not need to install any IBM Director-specific agents on the monitored devices. You do need to configure SNMP on the managed device so that the host running IBM Director is one of its SNMP trap destinations.

Requirements

Managed devices and the IBM Director server software have different software requirements.

Managed Devices

This topic explains software requirements for managed devices.

Managed devices (servers and service processors) must have the following software installed and configured properly.

A complete and current listing of supported Sun servers, service processors, and service processor firmware is available at the following web site:
http://www.sun.com/systemmanagement/tools.jsp
Please consult this website before installing this integration package.

Device	Software Requirements
SPARC/ILOM and x64/ILOM Service Processors	Sun Integrated Lights Out Manager (ILOM) firmware at 2.0 or higher No IBM Director agents are required on the managed device. **Note:** If the firmware version installed on an x64/ILOM service processor is earlier than 2.0, you must update your firmware to 2.0 or higher for the integration with IBM Director to work.
x64/EmbeddedLOM Service Processors	Sun Embedded LOM firmware No IBM Director agents are required on the managed device.
SPARC/ALOM and SPARC/ILOM Servers	Solaris 10 operating system (see product documentation for versions) Sun SNMP Management Agent for Sun Fire™ and Netra™ Systems installed No IBM Director agents are required on the managed device.
x64/ILOM	Sun Server Hardware Management Pack compatible operating system.

IBM Director Server Software

This topic describes the software requirements for IBM Director.

Integration between IBM Director and Sun devices has been tested with the following versions of IBM Director software.

Component	Version	Operating System and Software
IBM Director	Version 5.20	Microsoft Windows Server 2003

Consult the IBM Director documentation for a complete list of supported operating systems.

Related Documentation

This topic provides references to related technical documentation.

For information about Sun integrations, Sun servers, and IBM Director, consult the following related documentation:

- *IBM Director Systems Management Guide: Version 5.20* (GC30-4165-00)
- *Sun™ SNMP Management Agent Administration Guide for Sun Fire™ and Netra™ Servers* (819-7978)
- *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188)
- *Sun Server Hardware Management Using SNMP* (820-7621)
- For documentation on the Sun Embedded Lights Out Manager, consult the product documentation that ships with your particular x64/EmbeddedLOM server.

Installing the Sun Integration Pack

This section describes how to perform the following tasks:

Downloading the Sun Integration Pack

To install the most current version of the Sun Integration Pack, download it from the following web site:

http://www.sun.com/systemmanagement/tools.jsp

Save the Sun Integration Pack to a working directory on the local system from which you plan to perform the installation and uncompress it.

Once you have downloaded the current version, uncompress the file. The installer is called `SDI.exe`.

Installing the Sun Integration Pack

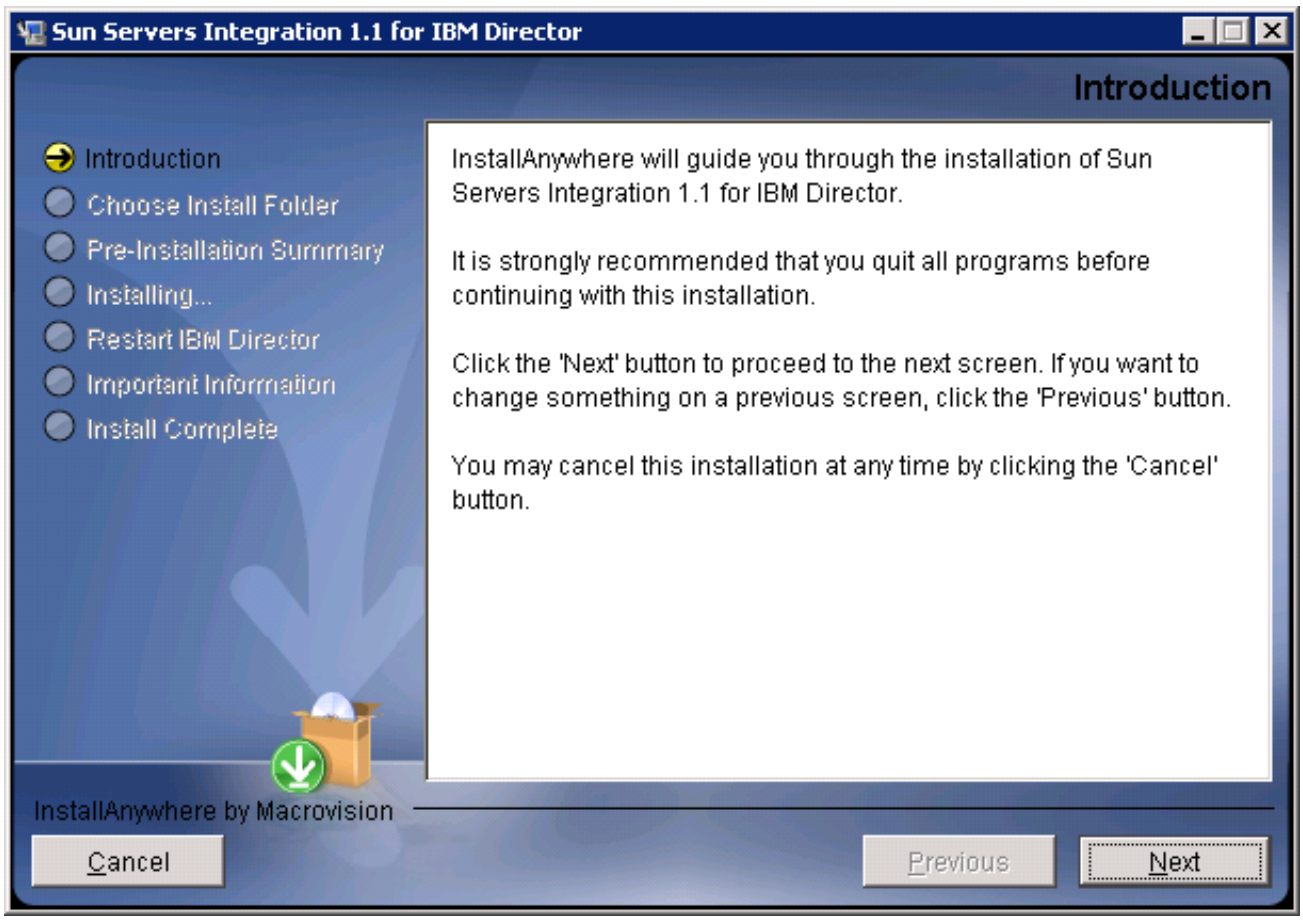
This topic explains how to install the Sun Integration Pack on your IBM Director server.

Before you attempt to install the Sun Integration Pack, you must first download the distribution archive and unpack it on a local system (server or workstation).

To install the Sun Integration Pack, do the following:

1. **From your Windows system, double-click the executable file `SDI.exe` that you unpacked in the previous procedure.**

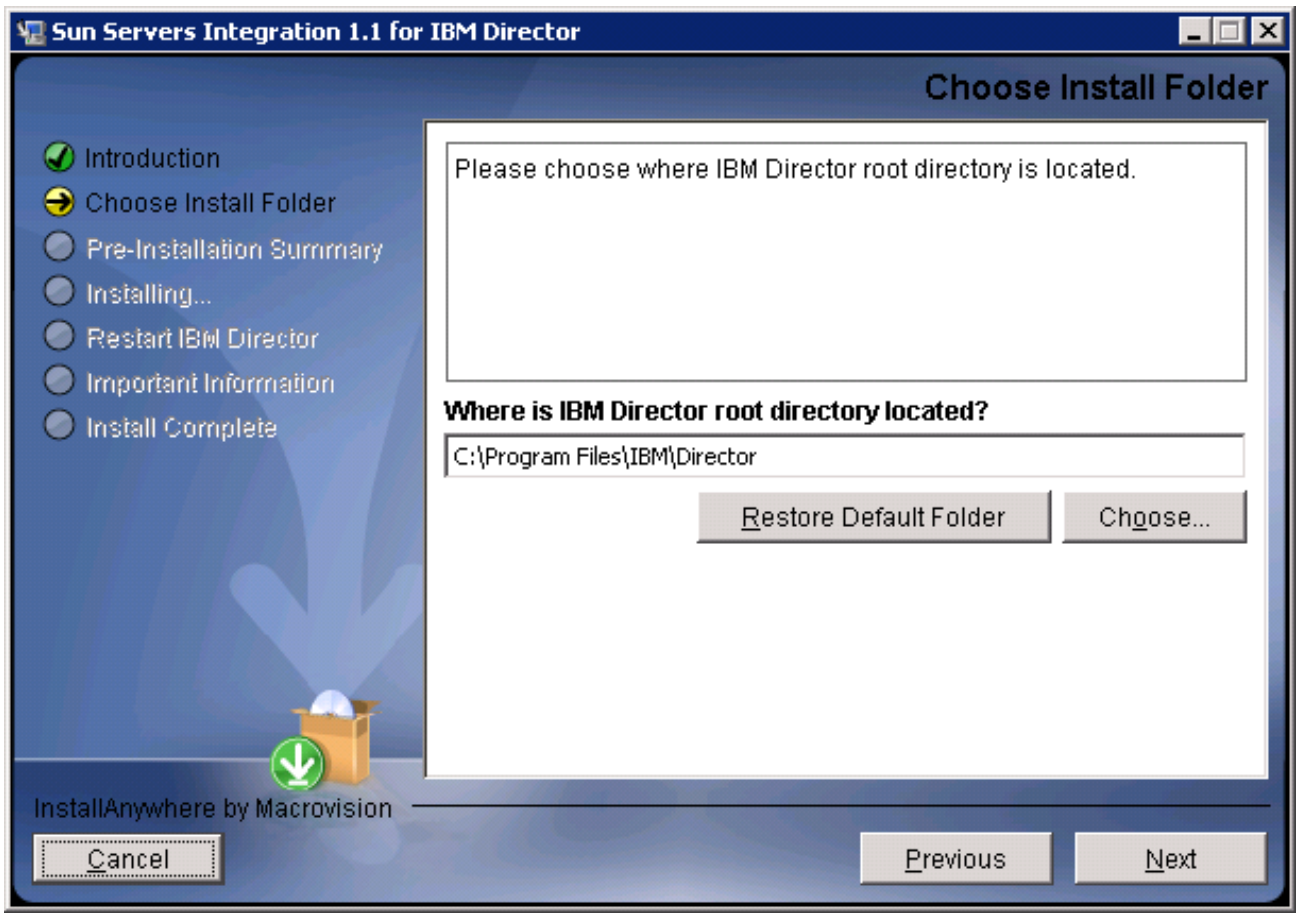
   The Install Wizard displays its opening screen.



The Install Wizard at this point checks that the IBM Director management software has been installed and that the Sun Integration Pack has not been installed. If the Install Wizard encounters one of these conditions, it displays an error message and exits the installation process.

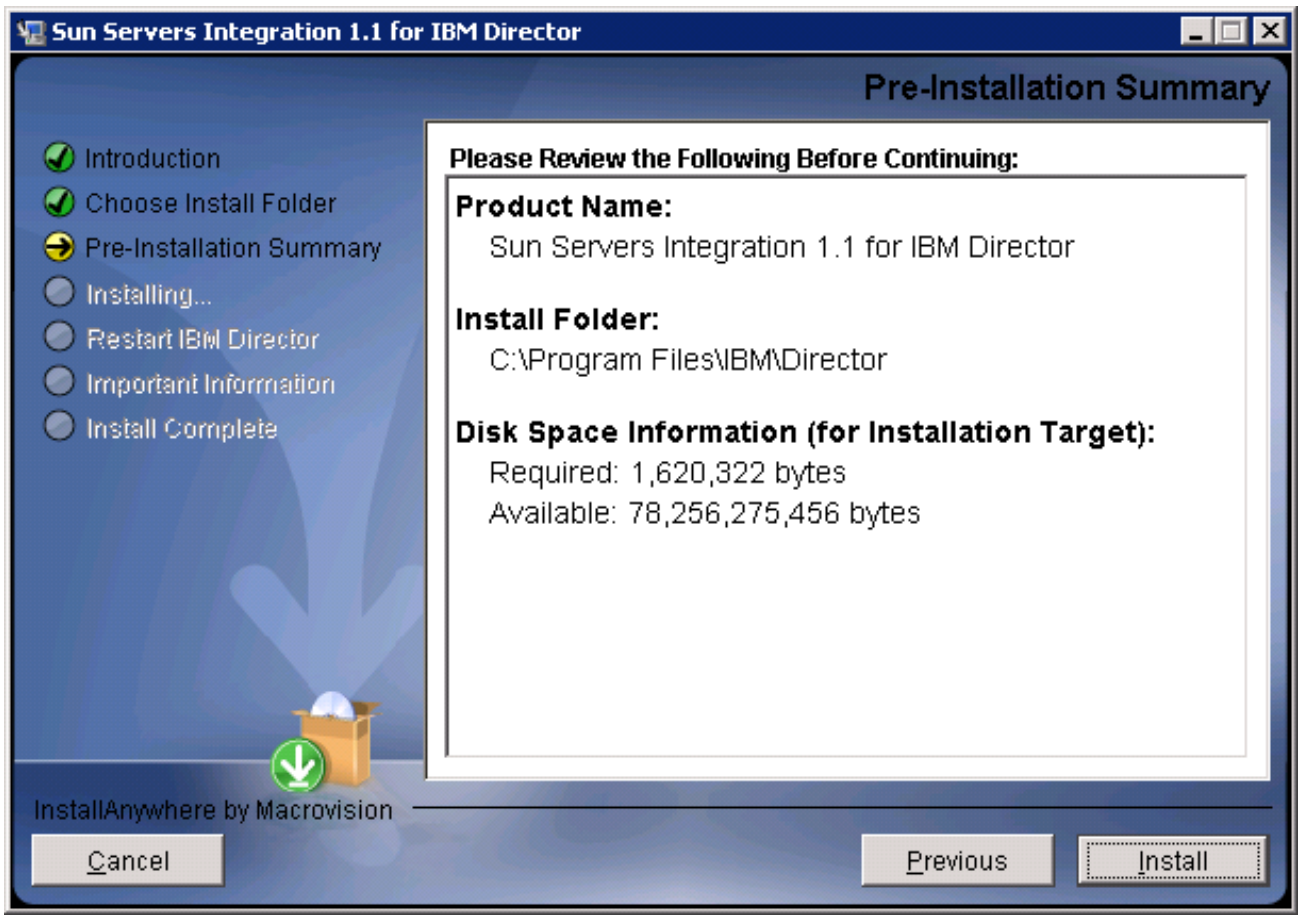
You must uninstall the Sun Servers Integration 1.1 for IBM Director before attempting to reinstall it.

2. **Click the Next button to display the following screen.**

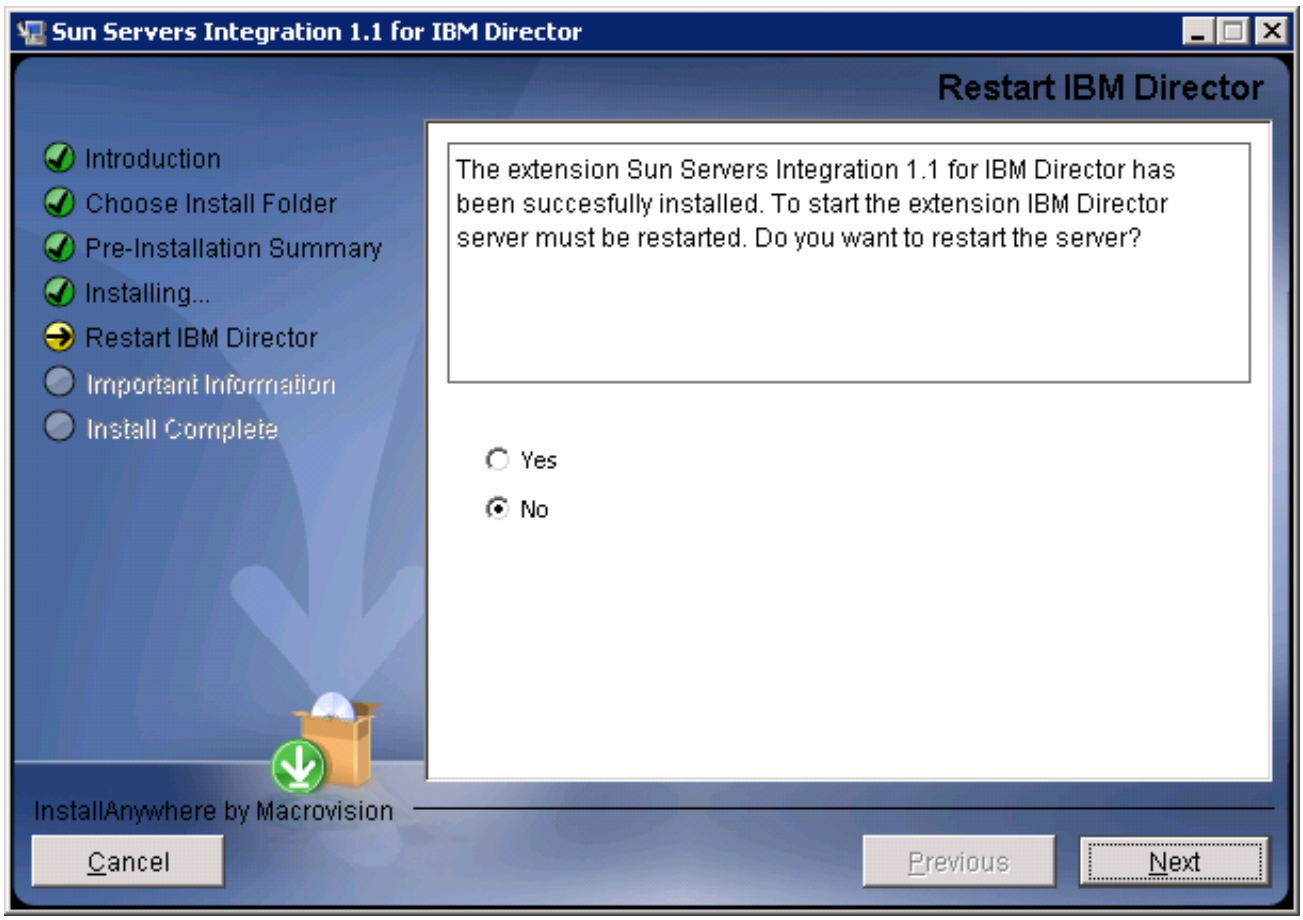


3. **Specify the root directory containing the IBM Director software or click the Choose … button to browse for that root directory.**

4. **Click the Next button to display the following screen.**



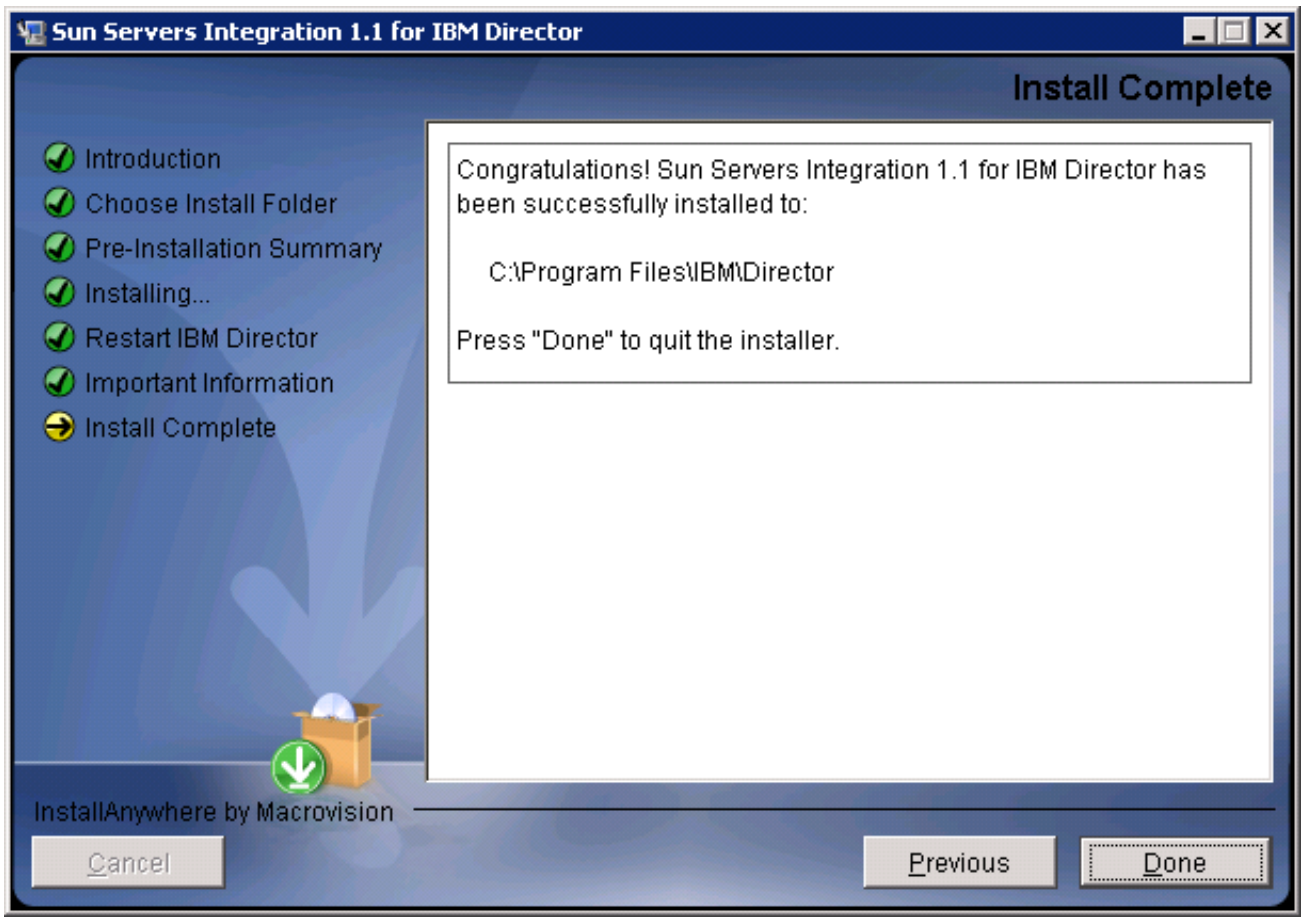
5. **Review the information displayed by the Install Wizard and click the Install button to proceed with installation.**
   The Install Wizard displays a progress indicator as it installs the Sun Integration Pack. When it completes installation, it displays the following screen.



6. **Click the Yes radio button to restart the IBM Director server immediately or No to restart it at some later time.**

   If you click Yes, the Install Wizard restarts the IBM Director server in order to complete the integration of the Sun Integration Pack.

Eventually the Install Wizard displays the following screen.



7. **Click the Done button to complete installation and to close the Install Wizard.**

No additional configuration is required on your IBM Director host server or management software. Properly configured Sun servers that have been discovered by IBM Director as SNMP Devices will send traps to the IBM Director Event Log immediately.

Verifying Successful Installation

This topic describes how to verify that the Sun Integration Pack has been installed successfully on your IBM Director server.

The best way to verify that the Sun Integration Pack has been successfully installed on your IBM Director host server is to display the list of available IBM Director extensions.

To verify correct installation, do the following:

1. **From the IBM Director Console, choose Help - Product Information.**

IBM Director displays a dialog box that lists the extensions that have been installed.

2. **Scroll down the list of displayed extensions to verify that the following entry is in the list:**

   `Sun Servers Integration <version> for IBM Director`

If the entry for the Sun Integration Pack is not displayed in the list, reinstall the Sun Integration Pack.

No additional configuration is required on your IBM Director host server or management software. Properly configured Sun servers that have been discovered by IBM Director as SNMP Devices will send traps to the IBM Director Event Console when as a hardware event occurs and as that hardware event gets processed by the Sun Integration Pack.

Uninstalling the Sun Integration Pack

This topic describes how to uninstall the Sun Integration Pack.

By default, the Install Wizard creates entries in the Windows Registry that identify the Sun Integration Pack as `Sun Servers Integration 1.1 for IBM Director`. To uninstall the Sun Integration Pack, you use the Windows Server Add or Remove Programs utility.

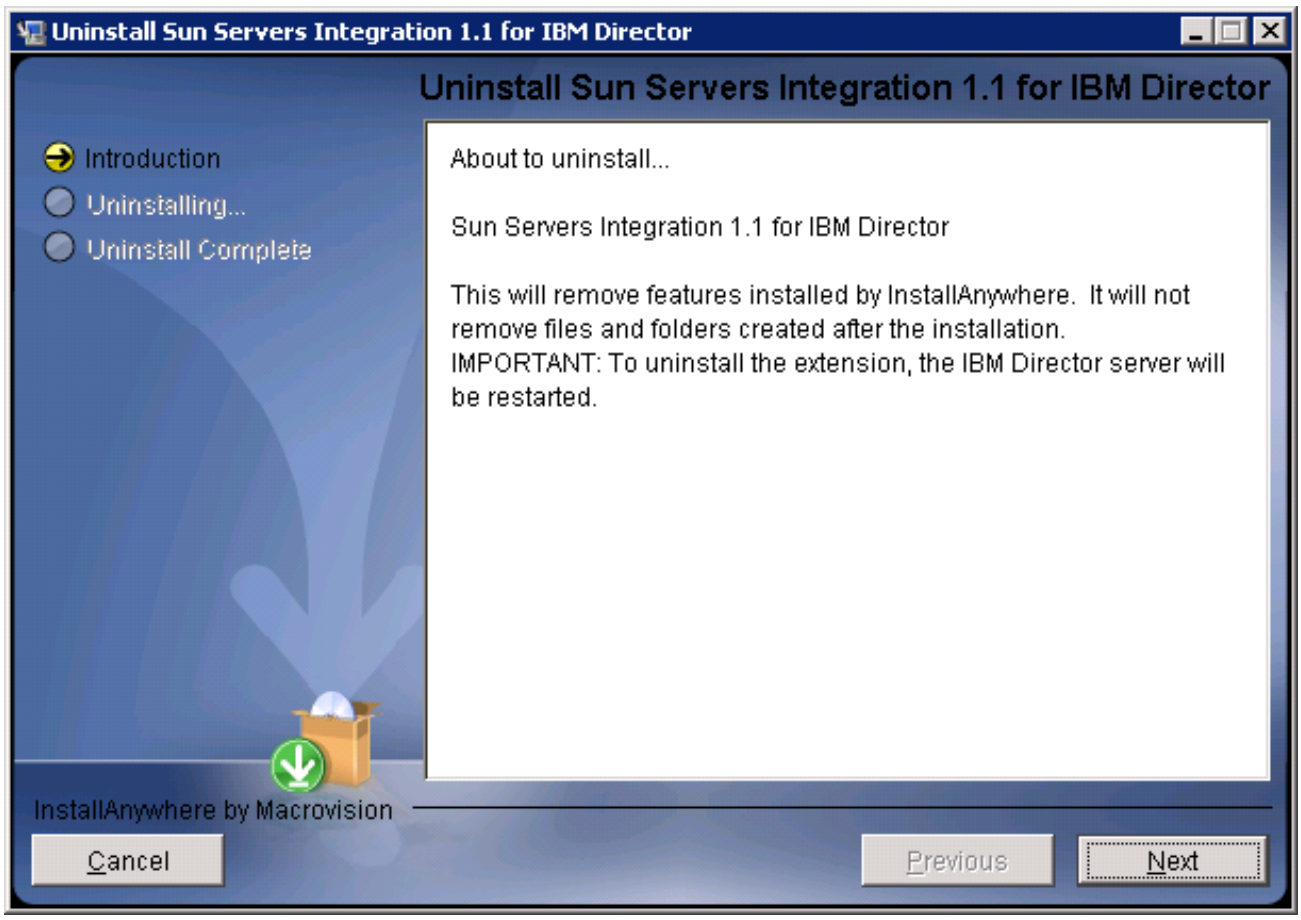
Note: The IBM Director server will be restarted as part of the uninstallation process.

To uninstall the Sun Integration Pack, do the following:

1. **At the Windows Desktop, choose Start - Control Panel - Add or Remove Programs.**
2. **Scroll down the list of installed programs until you see an entry named `Sun Servers Integration 1.1 for IBM Director`.**
3. **Click the Change/Remove button.**

   Windows launches the Sun Uninstall Wizard.

   Note: The IBM Director server will be restarted as part of the uninstallation process.



4. **Click the Next button to proceed with uninstallation.**

   Eventually the Uninstall Wizard displays the confirmation screen.

5. **Click the Done button to complete uninstallation.**

   The entry for the Sun Integration Pack should *not* be displayed in the list of installed programs.

If the Sun Integration Pack has been successfully uninstalled from your IBM Director host server, the Help - Product Information dialog box will *not* display an entry for the Sun Integration Pack.

Configuring Sun Devices For Integration

This section describes how to configure your Sun devices to be monitored by IBM Director.

A complete and current listing of supported Sun servers, service processors, and service processor firmware is available at the following web site:
http://www.sun.com/systemmanagement/tools.jsp
Please consult this website before installing this integration package.

You can integrate Sun servers with IBM Director at two levels:

- *SNMP OS*: Operating system level integration using the SNMP protocol
- *SNMP SP*: Service processor level integration using the SNMP protocol

Sun provides SNMP OS level management agents for SPARC and x64 architectures with different types of service processor. For information on the various operating systems supported please see the following web pages:

- http://www.sun.com/systemmanagement/managementtools.jsp

Sun Device	Integration	Configuration Task
SPARC/ALOM server SPARC/ILOM server	SNMP OS	Configure the Sun™ SNMP Management Agent for Sun Fire™ and Netra™ Systems.
SPARC/ILOM x64/ILOM	SNMP SP	Enable and configure SNMP on the ILOM service processor. For older ILOM 2.x service processors, optionally specify a value for the snmpEngineID on the ILOM service processor.
x64/ILOM	SNMP OS	Configure the Sun™ Server Hardware Management Pack
x64/EmbeddedLOM	SNMP SP	Enable and configure SNMP on the Embedded LOM service processor.

Configuring SNMP on SPARC Solaris Servers

If you want IBM Director to use OS-based SNMP to monitor your SPARC Solaris servers, the Sun™ SNMP Management Agent for Sun Fire™ and Netra™ Systems (hereafter SPARC SNMP Management Agent) must be installed and configured on each of these SPARC Solaris nodes.

Installation

To evaluate SNMP system requirements for your SPARC Solaris server and to learn how to install the SPARC SNMP Management Agent on it, consult the following Sun manual:

- *Sun™ SNMP Management Agent Administration Guide for Sun Fire™ and Netra™ Servers* (Part Number 819-7978). You can download this manual from *http://docs.sun.com*.

Configuration

For integration between the SPARC SNMP Management Agent and IBM Director to work correctly, you must verify that the SPARC SNMP Management Agent configuration file on your managed SPARC Solaris nodes contains the following entries.

To update that configuration file, do the following:

1. **On the managed server, open the following configuration file in a text editor:**

   `/etc/opt/SUNWmasf/conf/snmpd.conf`

2. **Configure (or verify) that the SPARC SNMP Management Agent is listening on port 161 on the following line.**

   `agentaddress 161`

3. **Verify that there is no other service running on port 161.**

   If there is, configure that service to run on a different port. Solaris 10 servers, for example, run an agent called SMA (Sun Management Agent) by default on port 161.

4. **Add an entry to specify whether you want to send SNMP v1 or SNMP v2 traps to IBM Director.**

SNMP format	Status	Entry
v1	Not recommended	trapsink *<destination_hostname>*
v2c	Required	trap2sink *<destination_hostname>*

   where *<destination_hostname>* specifies the name or IP address of the destination server receiving the SNMP V1 (trapsink) or v2c (trap2sink) traps from the SPARC SNMP Management Agent.

   Note: Adding both lines will result in the SPARC SNMP Management Agent sending IBM Director two traps for each alert and those redundant alerts appearing in the target event console.

5. **For versions of the Sun SNMP Management Agent earlier than version 1.6, uncomment the following line in the final section of the file.**

```
##########################################################
# SECTION: Trap compatibility mode
. . .
SUNW_alwaysIncludeEntPhysName   yes
```

   Enabling this mode for the SPARC SNMP Management Agent adds more detailed sensor and device names to traps and eliminates the need for generic messages such as 'A device has been disabled.'

6. **Save the modified file.**

   For these changes to take effect, you must force the SPARC SNMP Management Agent to re-read the configuration file.

7. **Enter the following commands in a terminal window to force the SPARC SNMP Management Agent to re-read its configuration file:**

```
# ps -ef | grep SUNWmasf | grep -v grep
```

This command returns the process ID of the SPARC SNMP Management Agent daemon running on your SPARC Solaris system.

```
# kill -HUP <snmpd_pid>
```

where <*snmpd_pid*> is the process ID of the SPARC SNMP Management Agent obtained in the previous sub-step.

The SPARC SNMP Management Agent also re-reads its configuration file automatically when it restarts.

Your Sun SPARC Solaris servers are now ready to be managed using IBM Director.

Configuring SNMP on x64/ILOM Servers

If you want IBM Director to use OS-based SNMP to monitor your Sun x64/ILOM servers, the Sun™ Server Hardware Management Pack (hereafter Hardware Management Pack) can be used.

Installation

Before installing the Hardware Management Pack, you must check that the operating system installed on the Sun x64/ILOM server is compatible. For more information on the Hardware Management Pack, consult the Sun Server Hardware Management Using SNMP manual at the following web page:

- *http://www.sun.com/systemmanagement/managementtools.jsp*

Configuration

For integration between the Hardware Management Pack and IBM Director to work correctly, you must verify that the Hardware Management Pack on your managed Sun x64/ILOM nodes is configured correctly.

To configure the Hardware Management Pack for integration with IBM Director, do the following:

1. **Configure (or verify) the SNMP interface to listen on port 161.**
2. **Configure the SNMP interface to send SNMP v2 traps to IBM Director.**

For more information on configuring the Hardware Management Pack, please see the following document:

- *Sun Server Hardware Management Using SNMP* (820-7621)

Your Sun x64/ILOM servers are now ready to be managed using SNMP within IBM Director.

Configuring SNMP On Sun Service Processors

To enable service processor level SNMP monitoring, you must configure SNMP on your Sun service processor.

A complete and current listing of supported Sun servers, service processors, and service processor firmware is available at the following web site:
http://www.sun.com/systemmanagement/tools.jsp
Please consult this website before installing this integration package.

Sun Server	Configuration Tasks
SPARC/ILOM x64/ILOM	Configure SNMP on your ILOM service processor. **Note:** If you have x64/ILOM service processors with a firmware version before 2.0, you must upgrade the firmware on that SP to 2.0 for the integration with IBM Director to work.
x64/EmbeddedLOM	Configure SNMP on your Embedded LOM service processor.

Configuring SNMP Monitoring On Service Processors

To enable service processor level SNMP monitoring, you must perform the following configuration tasks on each service processor:

- *Configuring SNMP Protocol Settings On Sun Service Processors* on page 20

If you encounter problems with identifying ILOM 2.0 service processors in IBM Director, you should perform the following:

- *Setting the SNMP engineid Field On ILOM 2.0 Service Processors* on page 20

Configuring SNMP Protocol Settings On Sun Service Processors

The exact procedure for configuring your Sun service processor to enable SNMP moniotoring depends on the exact type of service processor being used. The following section explains the general actions you should perform on a service processor to enable it to be monitored using IBM Director.

1. **Permit access for SNMP v2c queries at port 161.**
2. **Configure SNMP v2c traps to be sent to the IBM Director destination.**

Your Sun service processor is now configured for SNMP monitoring.

Setting the SNMP engineid Field On ILOM 2.0 Service Processors

This topic describes how to set the ILOM 2.0 SNMP engineID field.

IBM Director requires that the SNMP value engineid be set to a unique identifier across all SNMP Devices monitored by IBM Director (an administrtatively unique identifier). Some ILOM 2.0 service processors set this field to a text string `none`, so you must set it manually on each x64/ILOM and SPARC/ILOM server that you plan to monitor in IBM Director.

To set the engineid field on ILOM 2.0 service processors, do the following:

1. **Log in to your ILOM 2.0 service processor command shell via SSH.**
2. **At the ILOM CLI command prompt, enter the following command:**

   ```
   -> set /SP/services/snmp engineid=UniqueString
   ```

   where *UniqueString* is some uniuque string that will differentiate this ILOM 2.0 service processor from all other ILOM 2.0 service processors.

3. **Log out of the ILOM service processor command shell.**

Verifying Successful Configuration

To the extent that the Sun Servers Integration 1.1 for IBM Director employs a variety of system management technologies to monitor different types of Sun servers, there is no one procedure that exercises every interface on each managed system in order to verify that the entire integration has been installed and configured properly. If you are physically located with your managed systems, you could always manually remove and re-insert a non-critical component on one Sun server after another. See the topic ' *Verifying Configuration Manually* on page 21' below for more information on manual verification. This manual procedure becomes impractical at large installations and impossible at remote locations. Performing remote verification is more convenient, but requires different procedures for OS-level or SP-level integrations and for different types of Sun servers (x64 or SPARC).

To determine which remote procedures are appropriate for your test plan and for the types of Sun servers supported by your management application, consult the following table.

CPU Type	SP Type	OS-level Procedure(s)	SP-level Procedure(s)
x64	ILOM	See ' *Verifying Configuration Remotely Using IPMItool* on page 22'	See ' *Verifying Configuration Remotely Using IPMItool* on page 22'
	Embedded LOM	Not supported	See ' *Verifying Configuration Remotely Using IPMItool* on page 22'
SPARC	ILOM	See '*Verifying Configuration Remotely Using psradm* on page 24'	See ' *Verifying Configuration Remotely Using IPMItool* on page 22'
	ALOM	See ' *Verifying Configuration Remotely Using ALOM* on page 22'	Not supported

The following sections describe how to perform each of these procedures.

Verifying Configuration Manually

If you are located physically near one or more of your Sun servers, you can always verify configuration by generating a physical event. The most reliable way to accomplish this is to remove and re-insert a non-critical component.

To test your configuration manually, do the following:

1. **Locate the Sun server or blade server module in your data center.**
2. **Identify a component on that system that is non-critical and hot-pluggable (for example, a redundant power supply or fan tray).**

   Note: Be certain that removal and re-insertion of this component will not affect the normal and routine operation of the server. Verify that the redundant component is not critical to the current state of the system.

3. **Remove that non-critical component.**

   Note: Be certain to follow all required software and firmware procedures required for the safe removal of any hot-pluggable component. Consult the Sun manual or online information system that ships with your Sun server for specific procedures related to removing the hot-pluggable component.

4. **After an appropriate amount of time (10 seconds minimum), re-insert the non-critical component.**
5. **In the message or event console of your management program, verify that removing/re-inserting the non-critical component has generated one or more hardware events.**

If you do not see the events in the Operations Manager Console, review this manual for required configuration steps or consult Troubleshooting topics.

Verifying Configuration Remotely Using ALOM

To verify that a remote ALOM-based SPARC Solaris system is configured correctly, do the following:

1. **Identify the name and/or IP address of the ALOM-based SPARC Solaris server that you want to test.**
2. **Log in to the ALOM CMT command shell on that remote system via an Ethernet or serial connection.**
3. **Enter the following command to determine the current state of the system locator LED.**

   ```
   sc> showlocator
   ```

   ALOM returns one of the following messages:

   - Locator led is ON
   - Locator led is OFF

   The following example assumes that the locator LED is currently OFF.

4. **Enter the following command to turn the locator LED on.**

   ```
   sc> setlocator on
   ```

5. **In the message or event console of your management package, verify that it has received an event from ALOM indicating that the locator LED is on.**
6. **Enter the following command to restore the locator LED to off.**

   ```
   sc> setlocator off
   ```

7. **(Optional) In the message or event console of your management package, verify that it has received an event from ALOM indicating that the locator LED is off.**

If you do not see these messages in the console, review this manual for required configuration steps or consult Troubleshooting sections.

Verifying Configuration Remotely Using IPMItool

Recent Sun servers support either an Integrated Lights Out Manager (ILOM) service processor or an Embedded LOM service processor. You can communicate with these ILOM and Embedded LOM service processors via their IPMI interfaces to have them generate non-critical, simulated events. If IBM Director receives these non-critical, simulated events from ILOM or from Embedded LOM, it is configured properly for actual events.

IPMItool is an open-source utility for managing and configuring devices that support the Intelligent Platform Management Interface (IPMI) version 1.5 and version 2.0 specifications. Versions of IPMItool are available for the Solaris, Linux, and Windows operating systems.

Operating System	IPMItool Distribution(s)
Solaris	- *Web*: *http://ipmitool.sourceforge.net/* - *Solaris 10 image*: IPMItool is available at `/usr/sfw/bin`. - *Software resource CDs*: Often distributed with Sun servers.
Linux	- *Web*: *http://ipmitool.sourceforge.net/* - *Software resource CDs*: Often distributed with Sun servers.
Windows	- *Web*: *http://www.sun.com/systemmanagement/tools.jsp*

Operating System	IPMItool Distribution(s)
	- *Software resource CDs*: Often distributed with Sun servers.

To verify that IBM Director is configured to receive hardware events from a server supporting an ILOM or Embedded LOM service processor, do the following:

1. **Collect the following information about the remote service processor that you want to test.**

Field	Description
<SPname>	The name or IP address of the service processor Example: 192.168.1.1
<SPadminname>	The administrator login name for the service processor Example: root
<SPadminpassword>	The administrator password for the service processor Example: changeme

2. **Enter the following IPMItool command to generate a list of all available sensors on that remote Sun server.**

```
# ipmitool -U <SPadminname> -P <SPadminpassword> \
-H <SPname> -v sdr list
```

For example, to get the list of available sensors on a Sun Fire X4200 M2 server with service processor with IP address 192.168.1.1, login/password root/changeme, you would enter the following command:

```
# ipmitool -U root -P changeme -H 192.168.1.1 -v sdr list
```

3. **In the output from IPMItool, identify the Sensor ID name of a sensor that has at least one entry in the Assertions Enabled or Deassertions Enabled fields.**

In the following example, IPMItool returns the following information about the sensor named *mb.t_amb*

```
Sensor ID             : mb.t_amb (0x9)
Entity ID             : 7.0 (System Board)
Sensor Type (Analog)  : Temperature
. . .
Upper critical        : 55.000
. . .
Assertions Enabled    : lnc- lcr- lnr- unc+ ucr+ unr+
Deassertions Enabled  : lnc- lcr- lnr- unc+ ucr+ unr+
```

This sensor monitors ambient temperature on the motherboard of servers.

Note: Exercise caution in choosing a sensor to use for a simulated event. Simulating unrecoverably high or low temperature for some sensors may cause the server to shut down.

4. **Enter the following IPMI command to generate a simulated event.**

```
# ipmitool -U <SPadminname> -P <SPadminpassword> \
-H <SPname> event <sensorname> <option>
```

For example, to generate a simulated event for exceeding the upper critical (ucr) ambient temperature on a Sun Fire X4200 M2 server with service processor at IP address 192.168.1.1 with ILOM SP login/password root/changeme, you would enter the following command:

```
# ipmitool -U root -P changeme -H 192.168.1.1 \
event mb.t_amb ucr assert
```

In the command shell, IPMItool returns information similar to the following:

```
Finding sensor mb.t_amb … ok
0 | Pre-Init Time-stamp | Temperature mb.t_amb | \
Upper Critical going high | Reading 56 > Threshold \
55 degrees C
```

5. **In the Operations Manager event console, verify that an event from ILOM or from Embedded LOM relevant to the sensor that you specified in your IPMItool command has been received.**
6. **(Recommended) Clear the simulated event with the following syntax:**

```
# ipmitool -U <SPadminname> -P <SPadminpassword> \
-H <SPname> event <sensorname> <option>
```

To clear (deassert) the simulated event in the previous example, enter the following command:

```
# ipmitool -U root -P changeme -H 192.168.1.1 \
event mb.t_amb ucr deassert
```

If you do not see these messages in the console, review this manual for required configuration steps or consult the Troubleshooting topics.

Verifying Configuration Remotely Using `psradm`

The Solaris utility `psradm(1M)` performs configuration on multiprocessor CPUs. When you use psradm to disable or to re-enable a CPU core, it generates a trap that should appear in the IBM Director event console. This procedure is appropriate if you are verifying configuration for a Sun SPARC Enterprise server supporting the ILOM service processor such as the SPARC Enterprise T5120 or T5220 server.

To use `psradm` to generate a trap for one of these supported systems, do the following:

1. **Identify the name and/or IP address of the server that you want to test.**
2. **Log in to that server as root or with administrator privileges.**
3. **Enter the following command to disable a specific CPU core on that remote server.**

```
# psradm -f <CPU_Core_ID>
```

where <*CPU_Core_ID*> is the ID for one CPUcore. For example, to disable core 0 on a Sun SPARC Enterprise T5120, you would enter the following command:

```
# psradm -f 0
```

The trap generated by the T5120 should appear in the IBM Director console in a format like the following:

```
CH/MB/CMP0/P0/CPU Device has been removed
```

4. **(Recommended) Enter the following command to re-enable that same CPU core on that remote server.**

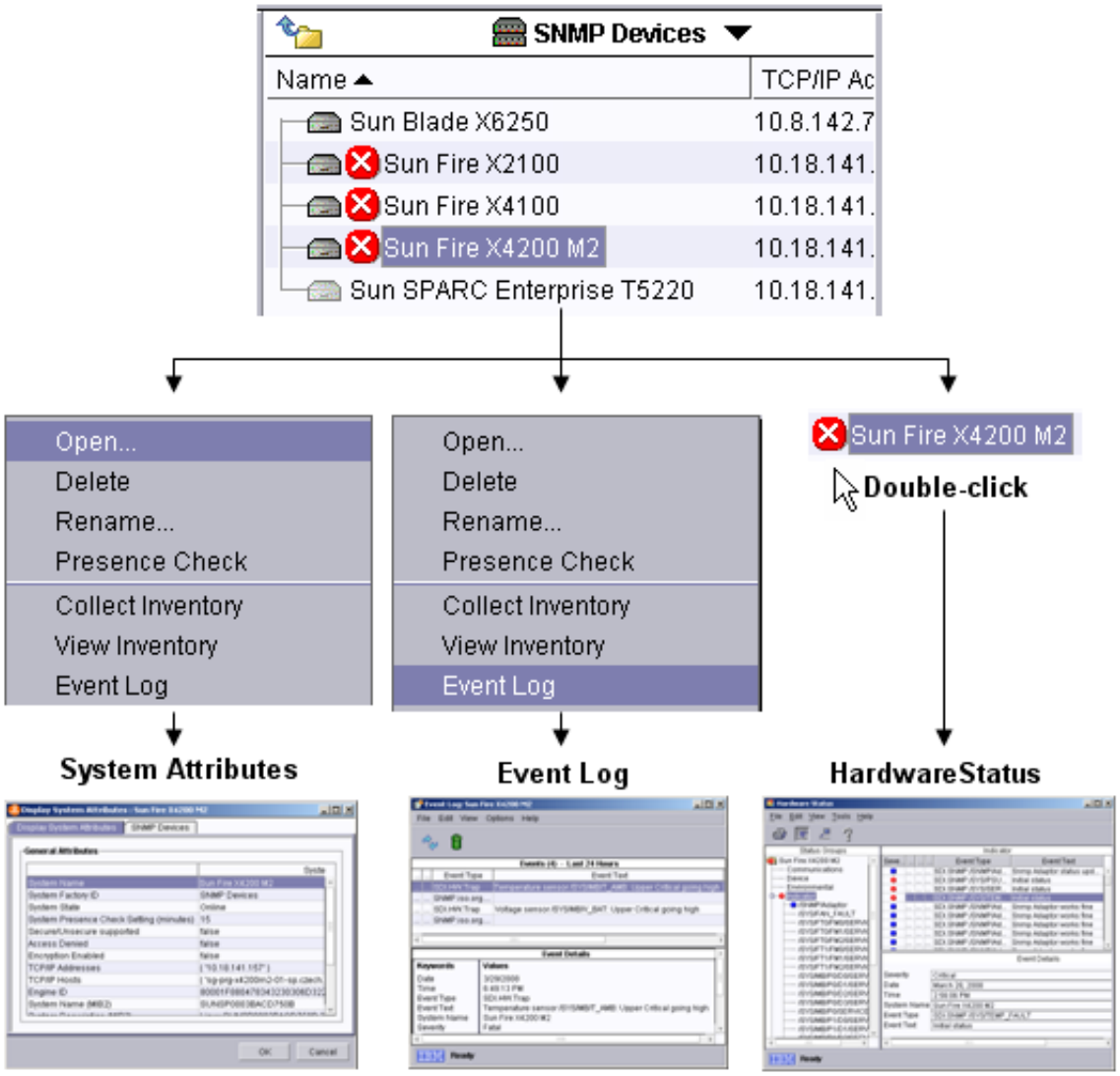
```
# psradm -n <CPU_Core_ID>
```

If you do not see these messages in the console, review this publication for required configuration steps and troubleshooting information.

Monitoring Sun Devices in IBM Director

Once you have installed the Sun Integration Pack and configured your Sun servers and service processors to send SNMP traps to IBM Director, you do not need to perform any additional configuration on your IBM Director software. Whether you let IBM Director discover your Sun devices automatically or you discover them manually, they begin sending SNMP traps to IBM Director as soon as they are discovered and as soon as a hardware event occurs. The Sun Integration Pack also begins polling each monitored Sun devices to build and to maintain a health profile for it.

All Sun devices are monitored in IBM Director as SNMP Devices. From the SNMP Devices view in the Details pane, you can monitor your Sun devices in three ways: properties, events, and hardware status.



This section explains how to use these tools to monitor your Sun devices. This section addresses the following topics:

- *Displaying Device Properties* on page 27
- *Monitoring Hardware Events* on page 28
- *Monitoring Hardware Health Status* on page 29

Displaying Device Properties

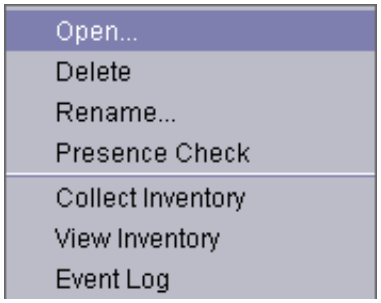
This topic explains how to monitor the device properties of Sun devices in IBM Director.

When monitoring large numbers of devices, it is useful to change the default names of Sun devices discovered by IBM Director into something more useful such as model numbers or inventory IDs and so forth. It is useful therefore to display the properties of a device before assigning a new name to it.

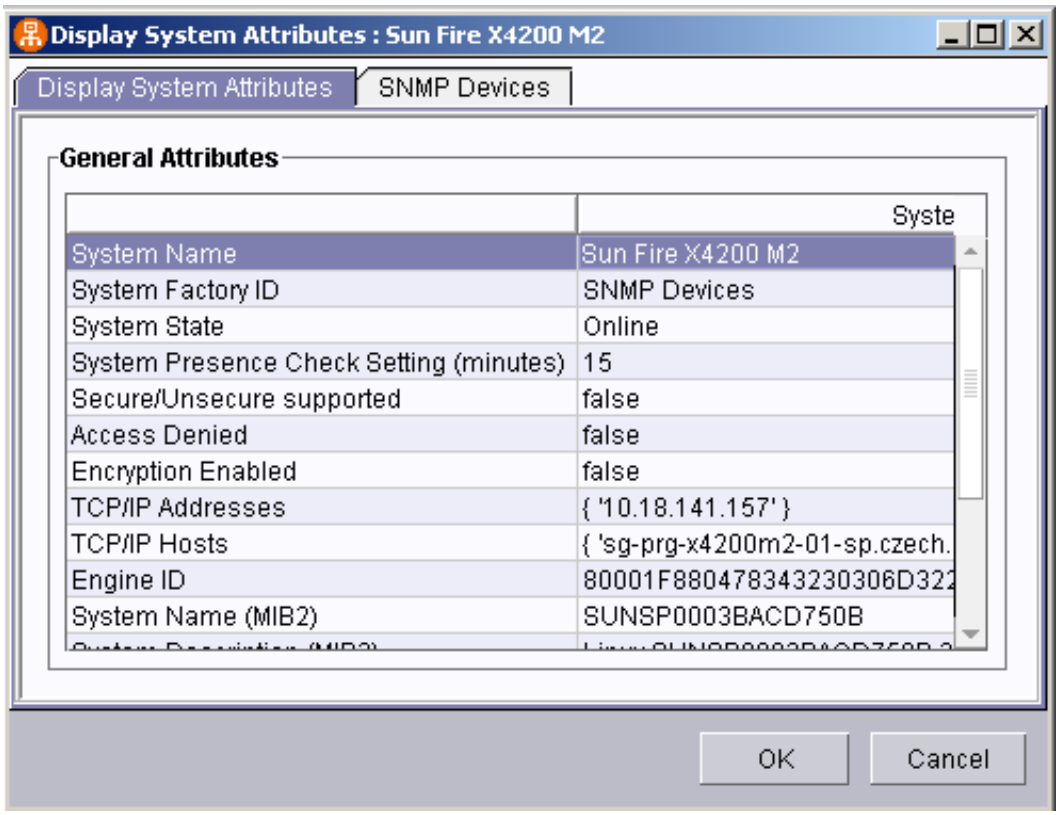
To display the device properties for any SNMP device in IBM Director, do the following:

1. **From the SNMP Devices view in the Details pane, right-click the entry for a Sun device.**

   IBM Director displays a pop-up menu.



2. **Click Open to display the Device Properties dialog box for the selected Sun device.**



In the System Attributes panel, for example, IBM Director displays both the default System Name derived from the SNMP MIB and the current System Name assigned to the device by you.

Monitoring Hardware Events

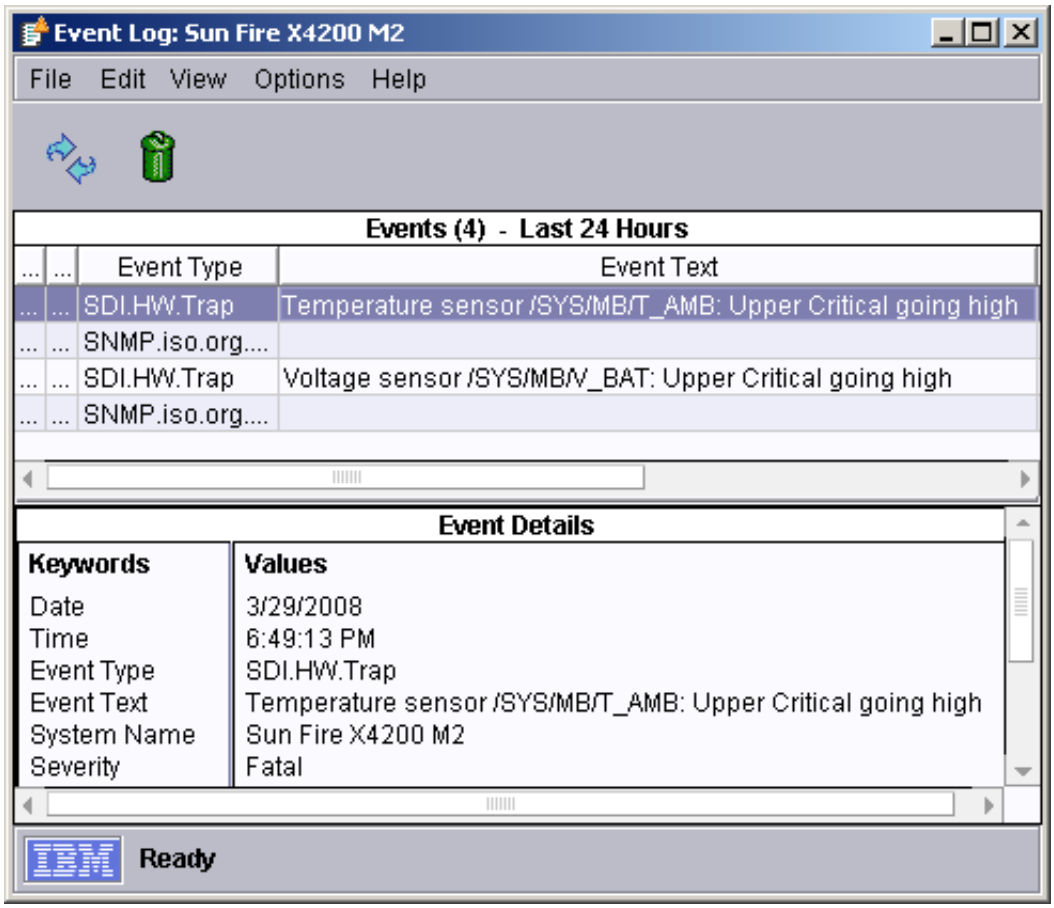
This topic describes how to interpret Sun-specific information in the IBM Director Event Log.

Once you have configured your Sun devices to communicate with IBM Director, the following types of messages appear in the IBM Director Event Log after a hardware event occurs:

- Translated SNMP traps (SDI.HW.Trap)
- Hardware status change events (SDI.HW.StatChange)
- Hardware update information, if you enable it (SNMP.HW.Update)
- Untranslated SNMP traps

Note: For more information about filtering out untranslated SNMP traps, see the IBM Director Help System.

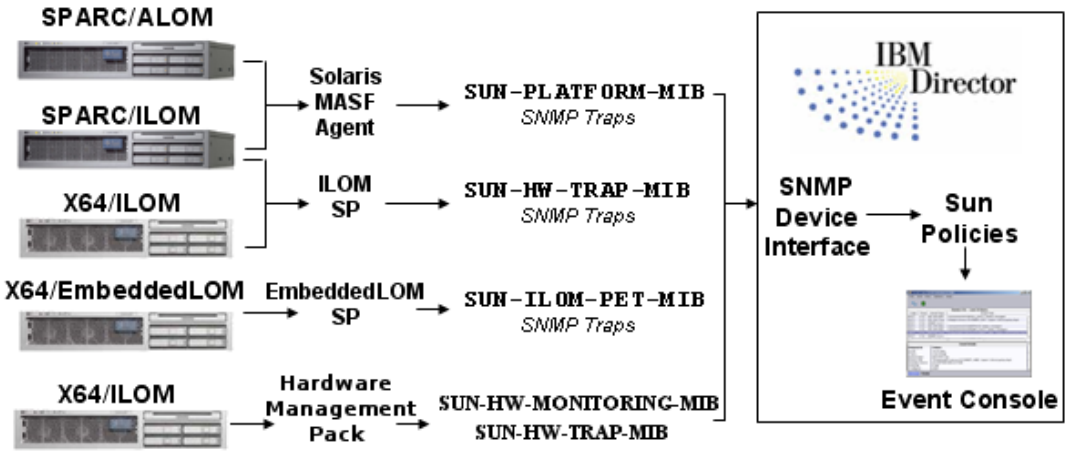
The following screen shot illustrates what is in the Event Log for a Sun Fire X4200 M2 server (x64/ILOM).



All trap notifications from Sun devices contain the following information:

- *Event type*: All traps from Sun devices have the SDI.HW.Trap identifier.
- *Event severity*: The Sun Integration Pack assigns a severity level to each trap based on its rules for interpreting traps.
- *Event text*: The Sun Integration Pack processes the textual description of the trap received from the Sun device.

The following diagram illustrates SNMP trap processing.



In addition to these SNMP traps, the Sun Integration Pack performs polling of monitored devices and generates server status change events. Based on these traps and status change events, you can develop IBM Director Event Action Plans that take further actions.

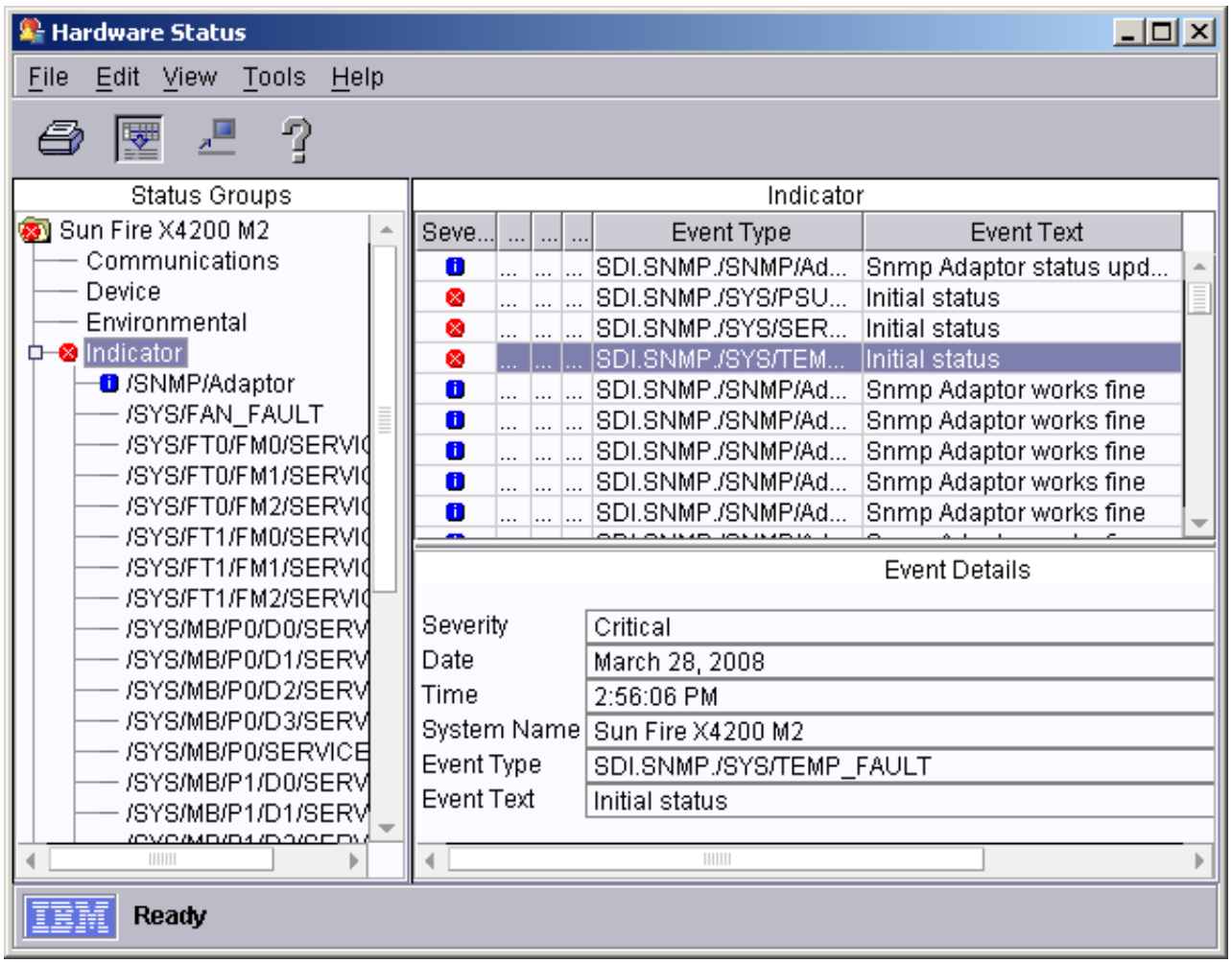
Monitoring Hardware Health Status

This topic describes how to interpret Sun-specific information in the Hardware Status component.

IBM Director provides a lot of information about the hour-to-hour or day-to-day traffic of messages received from one of your Sun devices, but it does not provide a summary status on the overall status and health of your Sun device. One of the most useful features of the Sun Integration Pack is its ability to build such a summary status of the health of your Sun device by performing SNMP polling of server sensors, LEDs, and agents. This polling happens independently of SNMP trap processing.

Ultimately you get a summary status of the health of your Sun device as being Status Critical, Status Information, or Status Warning.

The following screen shot illustrates what the Sun Integration Pack has built as a "health model" for a Sun Fire x4200 M2 server (x64/ILOM).



The Sun Integration Pack provides information about each monitored sensor, system LED, or agent to the Hardware Status component. If any sensor, system LED, or agent is in a critical state, for example, the Hardware Status component flags that item as critical (red X icon) and flags the overall status of the Sun device as critical. The "health model" is propagated up the sensor-LED-agent tree.

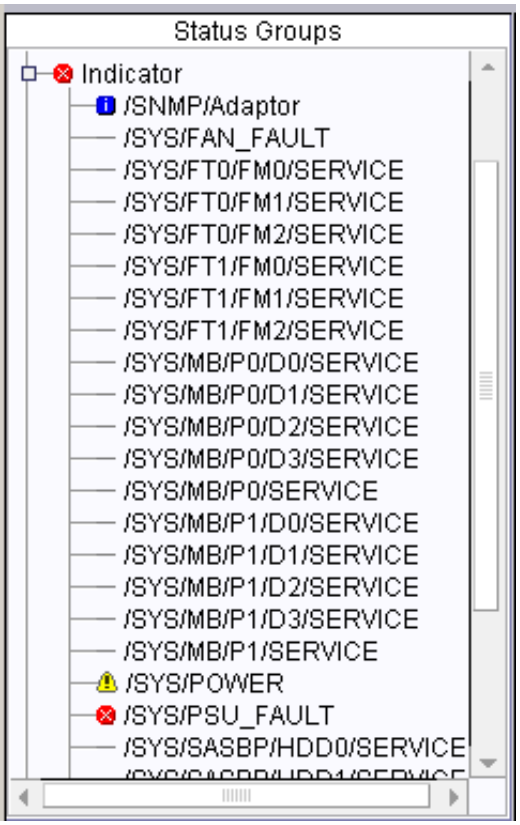
Interpreting SNMP/Adaptor Indicator Status

At the top of the tree of indicators in the IBM Director Hardware Status component is the entry named SNMP/Adaptor. Unlike the entries that follow it in the tree, the SNMP/Adaptor entry monitors the status of the SNMP agent on the monitored Sun device, not one of its sensors or LEDs. If the SNMP agent on the Sun device is responsive and functioning properly, the status of the SNMP/Adaptor is Informational (healthy). If the agent is not available or cannot provide required information, the Sun Integration Pack flags it as Warning and updates the Hardware Status component.

Interpreting Sensor or LED Status

The Sun Integration Pack SNMP polling of Sun devices to build a "health model" for its sensors or LEDs. When it builds and maintains this "health model," the Sun Integration Pack focuses in on different monitored objects.

Sun Device	Monitored Objects
x64/ILOM SPARC/ILOM (SP or MASF)	The Sun Integration Pack is able to monitor a configurable set of LED indicators on ILOM- and MASF-based servers. As the server forwards traps to IBM Director, the Sun Integration Pack monitors that status of these LED indicators and builds both an individual status for each LED and an aggregate status for the entire system, its "health model."

Sun Device	Monitored Objects
SPARC/ALOM (MASF)	 You can configure which indicators are monitored by the Sun Integration Pack and how the Sun Integration Pack assigns severity status to those indicators. See '*Customizing Hardware Health Status Reporting* on page 33' for information about customizing indicator monitoring in the Sun Integration Pack. If a particular sensor, for some reason, generates erroneous critical status, you can disable further reports from that sensor by right-clicking its entry in the tree and choosing Ignore Events.
x64/EmbeddedLOM	The Sun Integration Pack monitors the status of individual sensors and reports an aggregate status for the entire system, its "health model." If a particular sensor, for some reason, generates erroneous critical status, you can disable further reports from that sensor by right-clicking its entry in the tree and choosing Ignore Events.

Troubleshooting

This topic presents a variety of troubleshooting strategies for Sun Integration Pack.

No SNMP Device Icon

Problem: If you do not see a color-coded icon for a discovered SNMP device (blue, red, or yellow), there has been some problem in the way that this device has been discovered.

Solution: Remove the SNMP device, check its SNMP configuration settings, and re-discover it manually.

Customizing Hardware Health Status Reporting

You can customize the way that the Sun Integration Pack builds a "health model" for your Sun devices in the IBM Director Hardware Status Tool.

This section addresses the following tasks:

- *Configuring Hardware Health Monitoring For All Sun Devices* on page 33: You can set the interval at which the health model is updated and set the level of informational reporting in a Sun-specific configuration file named `SDIConfig.properties`.
- *Configuring Hardware Indicator Monitoring* on page 34: You can determine which system indicators contribute to health monitoring and what severity is assigned to each system indicator in a Sun-specific configuration file named `SDIIndicators.properties`.

Configuring Hardware Health Monitoring For All Sun Devices

This topic describes how to configure the interval and level of informational reporting for health monitoring.

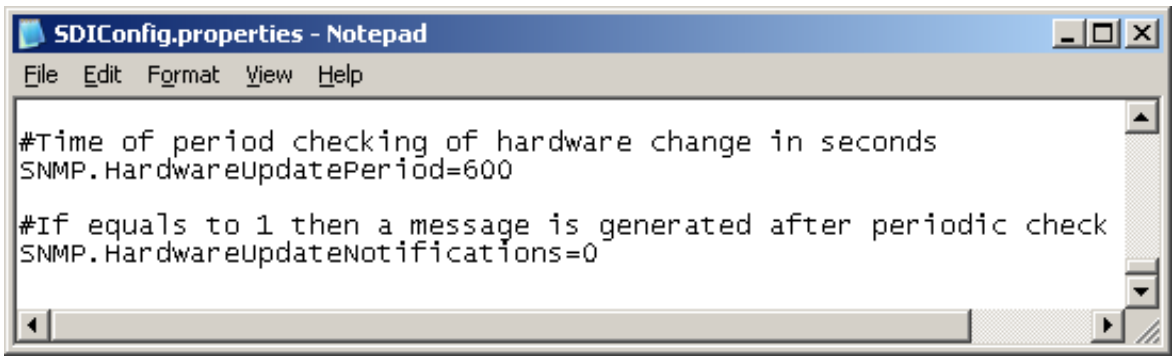
You can set the interval at which the health model is updated and set the level of informational reporting in a Sun-specific configuration file named `SDIConfig.properties`.

To set these options, do the following:

1. **Open the Sun-specific configuration file named `SDIConfig.properties` in a text editor.**

   Note: The Sun Integration Pack Install Wizard installs this file in the `classes` subdirectory of the IBM Director root directory.

2. **Scroll down the file until you see the following configuration entries:**



3. **Update the values for one or both entries.**

Entry	Default	Description
`SNMP.HardwareUpdatePeriod`	600	Specifies in seconds the interval at which the Sun Integration Pack rebuilds its health model for all your monitored Sun devices.
`SNMP.HardwareUpdateNotifications`	0	Specifies whether the Sun Integration Pack disables (0) or enables (1) update notifications from monitored Sun devices.

4. **Save the modified configuration file.**

Configuring Hardware Indicator Monitoring

This topic explains how to customize how the Sun Integration Pack interprets system indicator data when it builds a health model for your Sun device.

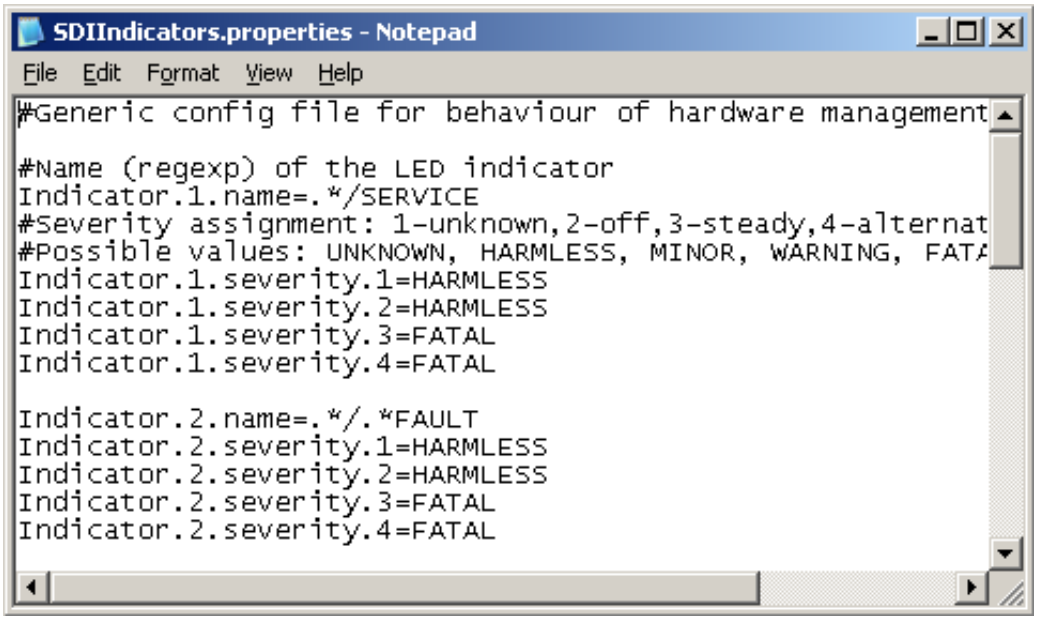
If you are monitoring Sun x64/ILOM, SPARC/ILOM, or SPARC/ALOM systems in IBM Director, you can determine which of their system indicators contribute to health monitoring and what severity the Sun Integration Pack should assign to each system indicator.

To customize hardware indicator monitoring, do the following:

1. **Open the Sun-specific configuration file named `SDIIndicators.properties` in a text editor.**

   Note: The Sun Integration Pack Install Wizard installs this file in the `classes` subdirectory of the IBM Director root directory.

   This configuration file contains an array of configuration blocks.



2. **Update the blocks of configuration entries according to the following guidelines.**

   - Observe the following block syntax:

```
Indicator.x.name=value_name
Indicator.x.severity.1=value_severity1
Indicator.x.severity.2=value_severity2
Indicator.x.severity.3=value_severity3
Indicator.x.severity.4=value_severity4
```

   where *x* is the unique, sequential array ID (1 - whatever) for that indicator configuration block and *value_name*|*severity* sets the following values.

Variable	Values
value_name	The name of the indicator as specified in the Sun device MIB.

Variable	Values
value_severity.1 (unknown) *value_severity.2* (off) *value_severity.3* (steady) *value_severity.4* (alternating) **Note:** These state descriptions are specific to sensors or LEDS on Sun servers.	One of the following severity levels to be assigned by IBM Director: • UNKNOWN • HARMLESS • MINOR • WARNING • FATAL

3. **Save the modified configuration file.**

Appendices

This section contains the following appendices:

Appendix A - Sun SNMP MIBs

Many Sun system management integration packages depend on the SNMP protocol and use one or more of the following Sun SNMP MIBs:

- **SUN-PLATFORM-MIB**: This MIB is used by Solaris-based servers to extend the ENTITY-MIB Physical Entity Table to represent new classes of component and the Logical Entity Table to represent high value platform and server objects. This MIB supplies the Sun SNMP Management Agent for Sun Fire and Netra Systems with traps. The operation of this MIB is described in the Sun publication *Sun SNMP Management Agent Administration Guide for Sun Blade, Sun Fire and Netra Servers* (819-7978).

  Filename: `SUN-PLATFORM-MIB.mib`
- **SUN-ILOM-PET-MIB**: This MIB enables management platforms that are not IPMI compliant to partly decode standard IPMI Platform Event Traps (PETS) generated by the ILOM v1.x and Embedded Lights Out Manager service processors.

  Filename: `SUN-ILOM-PET-MIB.mib`
- **SUN-HW-TRAP-MIB**: This MIB supplements and enhances the SUN-ILOM-PET MIB for ILOM 2.0 systems.

  Filename: `SUN-HW-TRAP-MIB.mib`
- **SUN-HW-MONITORING-MIB**: This MIB enables hardware inventory, status, version and power consumption information related to the Sun server or blade implementing this MIB. SNMP Traps associated with this server are defined in a separate SUN-HW-TRAP-MIB.

  Filename: `SUN-HW-MONITORING-MIB.mib`

To view a summary of the entries in these MIBs or to download them, consult the following Sun web site:

http://www.sun.com/systemmanagement/tools.jsp

Sun Integration Pack may also make use of other system management MIBs.

Appendix B - Installed Files

This topic provides a list of Sun-specific files installed on your IBM Director management server.

The Install Wizard for Sun Servers Integration 1.1 for IBM Director installs the following files in the subdirectory named `classes` under the IBM Director root directory (`$ROOT$`):

```
$ROOT$\classes\extensions\SDI.TWGext
$ROOT$\classes\SDI.jar
$ROOT$\classes\SDIConfig.properties
$ROOT$\classes\SDIIndicators.properties
```

```
$ROOT$\classes\PETMibMessages.properties
$ROOT$\classes\PLATMibMessages.properties
$ROOT$\classes\SUNPETTrapMessages.properties
$ROOT$\classes\SDIExtension.properties
```

Appendix C - Release Notes

This topic provides late-breaking information about the Sun Integration Pack.

Launching the Hardware Status Component

In IBM Director you cannot launch the Hardware Status component from the Tasks pane. You must double-click the color-coded icon displayed next to each Sun device in the SNMP Devices view of the Details pane.

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