

Fault Management

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One of the most important functions of ASM Pro is fault management. This is accomplished through the use of threshold settings and hardware error detection methods.

The ASM Server Agent performs two tasks when it encounters an error:

1. Sends a trap to ASM Manager Station.
2. Broadcasts a message to all users on the server about the error condition.



The Broadcast Message check box must be checked before the Agent can broadcast error messages. See the screen shown in Event Notification and Threshold Setup later in this chapter.

After the ASM Manager Station receives a trap from the Agent, the Station also performs two tasks:

1. Logs the trap information into a log file. This log file may then be reviewed at a later time. See the Trap Log section later in this chapter for information about event logs.
2. Sends a message to the system administrator. ASM has several ways of alerting the system administrator. See the Event Notification Setup section for more information.

Threshold Settings

All threshold settings are preset to the factory-recommended values. The following threshold values are user-configurable:

- PCI Bus Utilization (for some models only)
- Memory Utilization
- File System Utilization

All other threshold values are internally preset and cannot be changed. In some models, you can set the threshold values in BIOS setup.

These threshold values are:

- Temperature warning
- Temperature critical
- Voltage exceeds safe range



See the Trap Handler Set up dialog box explained in Event Notification and Threshold Setup for definitions of each threshold.

An example of non-configurable threshold values is the internally-preset *temperature warning* and *temperature critical*. For example, the manufacturer-suggested threshold value for some types of Pentium CPUs is between 131°F - 167°F (55°C - 75°C). (131°F (55°C) is the temperature warning threshold; 167°F (75°C) is the temperature critical threshold.) ASM reads and checks the manufacturer's preset temperature warning and temperature critical range whenever this type of Pentium CPU is detected.

Hardware Errors

The following hardware errors are detected by ASM Pro:

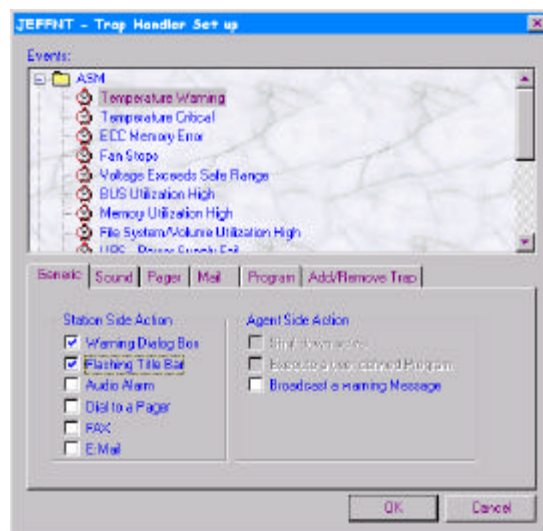
- ECC memory error
- Fan stoppage
- UPS related errors (power supply, AC power, power supply fan) (applies only to certain systems)
- Redundant Power Supply related errors (power supply, power supply fan) (applies only to certain systems)
- Fuse
- Chassis

Event Notification Setup

User can highlight the desired server agent name in the "System Listing" window, then select "Event Notification Setup" option in the "Setup" menu.

This section describes how the ASM Manager Station handles a trap and what action it will take to correct the error condition.

Once the ASM Manager Station has established a connection with the monitored server for the first time, you must run Event Notification and Threshold Setup in order to set up the event handling action methods. Otherwise, the ASM Manager Station will not take the appropriate action in the event of a server system failure.



This dialog box allows you to set different event handling methods for each event type.

When the check box in the Agent Side Action frame is grayed out it indicates that you can only enable this action at the agent side.

Event Types

When the ASM Server Agent detects an error condition on the server, it (Agent) sends a trap (interrupt signal) to the ASM Manager Station. Any exceeded threshold value, whether user-configurable or internally preset, will cause the agent to send a trap to the ASM Manager Station. A trap is also sent when a hardware error is detected by the agent.

The following list describes the event types and what they mean:

- Traps Other Than ASM

The agent will send a trap to the station when the ASM Server Agent detects a system trap that is not listed in the ASM event type listing.

- System Up/Down Alert

Every time the server system is booted up or shut down the agent will send a trap to the ASM Manager Station. The station notifies the administrator by the method selected in the Station Side Action boxes.

- Temperature Warning

The CPU temperature has exceeded the first threshold level setting. A typical default threshold setting is 131°F (55°C). When the threshold is exceeded, the ASM Server Agent broadcasts a „Temperature Warning“ message to all users on the server. The Agent also sends a „Temperature Warning“ event trap signal to the ASM Manager Station. The Station handles the event by the method selected in the Station Side Action frame in the above figure.

A trap is sent every minute thereafter as long as the temperature remains above the threshold. Each one of these traps is recorded by the station in the event log file.

You can check the temperature of a server by clicking on the **Hardware Environment** toolbar button on the ASM Manager Station.

- Temperature Critical

Indicates a CPU temperature has exceeded the second threshold level setting. A typical default threshold setting is 167°F (75°C). This value is not user-configurable.

When the Temperature Critical threshold is exceeded, the ASM Server Agent sends a broadcast and a trap, after which the server is shut down to prevent loss of data and possible damage to the hardware. The *asmconfig* utility may also be used to disable the auto shut down feature. See the ASM Server Agent Utilities section of the ASM Pro Utilities chapter.

Click on the **Hardware Environment** toolbar button on the ASM Manager Station to check the temperature of a server.

- ECC Memory Error

An ECC memory error has been detected. The ASM Server Agent sends a broadcast and a trap. Immediately back up your data files. The memory should be replaced immediately to protect the data integrity.

- Fan Stops

A system fan has stopped rotating. The ASM Server Agent sends a broadcast and a trap when this occurs. Replace the defective fan to ensure that the system stays within the heat tolerances for that server. You can verify that the fan is functional by clicking on the **Hardware Environment** toolbar button on the ASM Manager Station.

- Voltage Exceeds Safe Range

The voltage reading is over the safe operating range. The ASM Server Agent sends a broadcast and a trap when this occurs. You can check the voltage by clicking on the **Hardware Environment** toolbar button on the ASM Manager Station.

- **Memory Utilization High**

The percentage utilization of the system memory has exceeded the threshold setting. The ASM Server Agent sends a trap when this occurs.

Add more memory to the server if possible. Refer to your system's User's Guide.

- **File System/Volume Utilization High**

The percentage utilization of the server volume has exceeded the threshold setting. The ASM Server Agent sends a broadcast and a trap when this occurs.

Perform system maintenance on the disk. Add another hard disk if the threshold is still exceeded after performing disk maintenance.

The following event types apply only to certain systems:

- **Bus Utilization High**

The percentage utilization of the PCI bus has exceeded the threshold setting. The ASM Server Agent sends a trap when this occurs.

Rearrange your PCI add-ins to even out bandwidth distribution, if possible.

- **UPS Power Supply Fail**

The server's uninterruptible power supply has failed. The ASM Manager Station sends a trap when this occurs.

- **UPS Battery Fail**

The server's UPS battery has failed. The ASM Manager Station sends a trap when this occurs.

- UPS Power Supply Fan Stops

The server's UPS fan has stopped. The ASM Server Agent sends a broadcast and a trap when this occurs.

- AC Power Fails

The server's AC power has failed. The ASM Server Agent sends a broadcast and a trap when this occurs, then the server is shut down. The `asmconfig` utility may also be used to disable the auto shut down feature. See ASM Pro Utilities for more information.

- Chassis Intrusion

The server's system cover is open. The ASM Server Agent sends a broadcast and a trap when this occurs.

- Fuse Fail

The Keyboard/Mouse, USB or SCSI fuse fails. The ASM Server Agent sends a broadcast and a trap when this occurs.

- Redundant Power Supply Fail

The server's Redundant Power Supply has failed. The ASM Server Agent sends a broadcast and a trap when this occurs.

- Redundant Power Supply Fan Fail

The ASM Server Agent sends a trap when this occurs. How the ASM Manager Station handles the trap is determined by the event notification method selected by the administrator at the Trap Handler Set up window.

- BIOS Event Log

The ASM Server Agent will send a trap of this type when BIOS detects some hardware and save to Event Log in NVRAM.

- BIOS Event Log High

The percentage utilization of the BIOS Event Log has exceeded the threshold setting. The ASM Server Agent sends a trap when this occurs.

- CPU Abnormal

The ASM Server Agent will send a trap of this type when CPU has internal error detected by BIOS.

- Asset Change

The ASM Server Agent will send a trap of this type when asset is changed.

Event Handling Method

The following list describes the event handling methods and the function of each method. You can check and uncheck as many of these boxes as desired. A check in the box enables the function; removing a check disables the function. Use your mouse pointer to check and uncheck these boxes.

When you click the **Generic Settings** folder, you will see a list of event notification methods in the Station Side Action box. Checking an event notification method will cause the ASM Manager Station to take the action indicated in the check box. Any changes to the Agent Side Action check boxes require the Agent password to be entered before changes are accepted if the agent password is enabled. See the agent's user's guide for more information about password setup.

Station Side Action

- Warning Dialog Box

A warning dialog box appears on the ASM Manager Station screen when the ASM Server Agent sends a trap to the station.

- Flash Title Bar

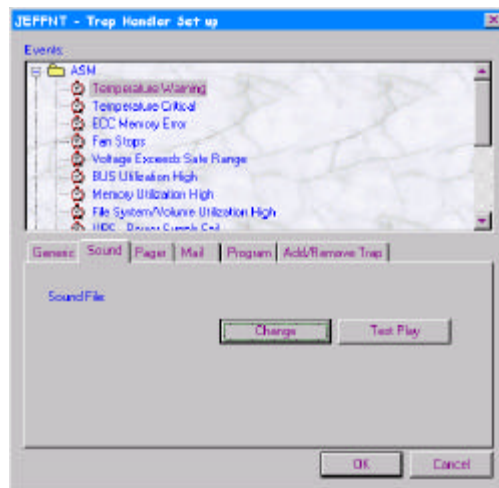
The title bar flashes on and off when the ASM Server Agent sends a trap to the station.

- Audio Alarm

The system makes a sound whenever a trap is received from the ASM Server Agent. The audio alarm box must be checked for this feature to work. You can change the sound the system makes by changing the sound file in the Sound File edit box. Select the Sound tab from the Trap Handler Setup screen. The following display appears:



You have to select sound file tab to setup sound file before marking the "audio alarm" trap action.



You must have a sound card for the sound file to work; otherwise, Audio Alarm won't work.

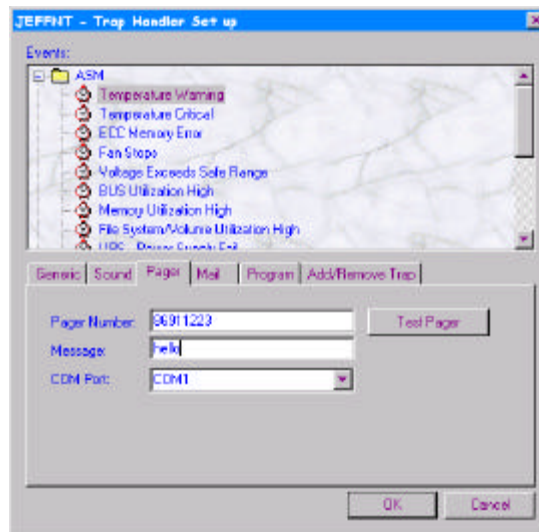
When you click on the **Change** button, you will see the Open Sound File screen from which you can choose a specified sound file to edit. The sound can be tested by clicking on the **Test Play** button.

- Dial to a Pager

The ASM Manager Station calls to a pager when the ASM Server Agent sends a trap to the station. Select the **Pager** tab from the Trap Handler Setup screen. The following display appears:



You have to select pager tab to setup pager before marking the "Dial to a pager" trap action.



You must enter the pager number in the Pager Number box and a message in the Message box. You also must enter the modem port in the COM Port box for dialing out from the Station. The pager can be tested by clicking on the Test Pager button.



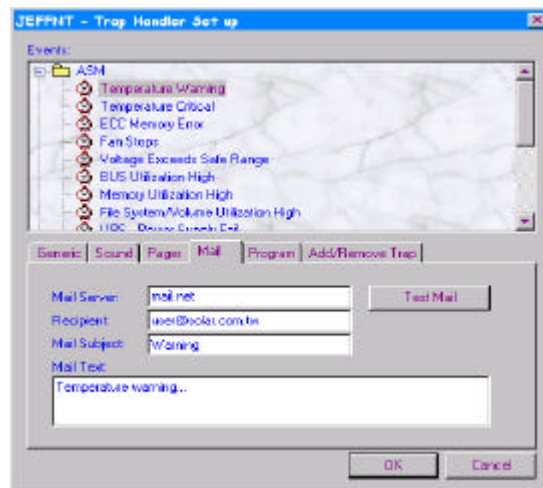
You must set up and configure MS Exchange before you can use the Fax and Mail function. For more information on MS Exchange, please refer to your MS Exchange User's Manual.

- Fax

ASM Station sends a fax when this event occurs. Fill out the information on the Fax Setup folder.

- Mail

The ASM Manager Station sends an E-mail when the ASM Server Agent sends a trap to the station. Select the **Mail** tab from the Trap Handler Setup screen. Fill out the information in the display. E-mail can be tested by clicking on the **Test Mail** button.



You must to select "Mail" tab to setup email information, before marking the "E:Mail" action.



You must set up and configure MS Exchange before you can use the Fax and Mail function. For more information on MS Exchange, please refer to your MS Exchange User's Manual.

Agent Side Action

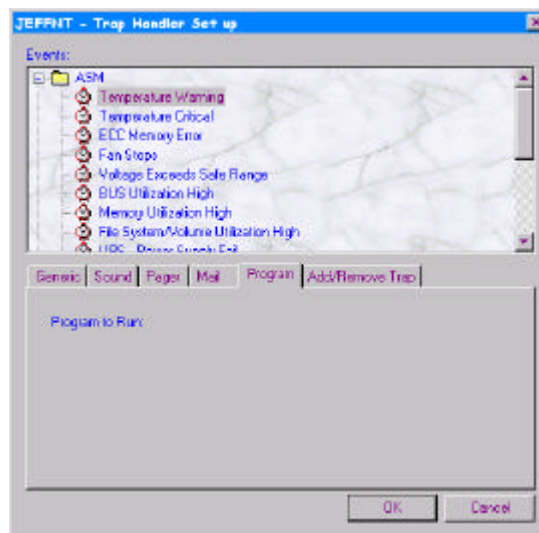
The next two options can only be set from the agent site and require the agent password to be entered before any changes are accepted (if the agent password is enabled). Please refer to the agent's user's guide for more information.

- Shut Down Server

The ASM Server Agent shuts down the server when this event occurs. This option is only available for a Temperature Critical event and AC Power Fail event. This box appears grayed out and unchecked for all other event types.

- Execute a User Defined Program

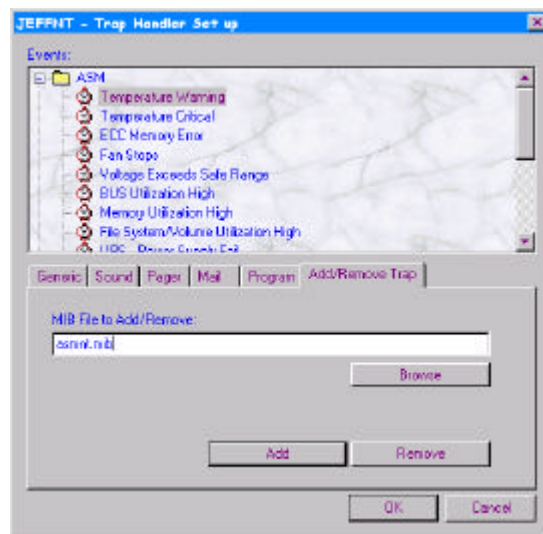
Executes a program when this event occurs. To enter the Program to Run display, select the **Program** tab from the Trap Handler Setup screen. The screen shown below displays.



The program to run may only be specified by using the *ASM config* utility at the agent server. The option appears grayed out from the ASM Manager Station. It only displays the program name if it is specified at the agent site.

- Add/Remove Trap

You can add or remove traps from other agents. This is useful if you have other agents other than ASM to manage your servers. To monitor an agent's trap, browse for the file using the Browse button and then click Add.



- Broadcast a Warning Message

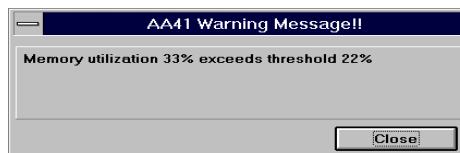
The server sends a broadcast to all users logged on the server when this event occurs. Most events have this box checked.

Setting Event Handling Methods

To set the event handling method:

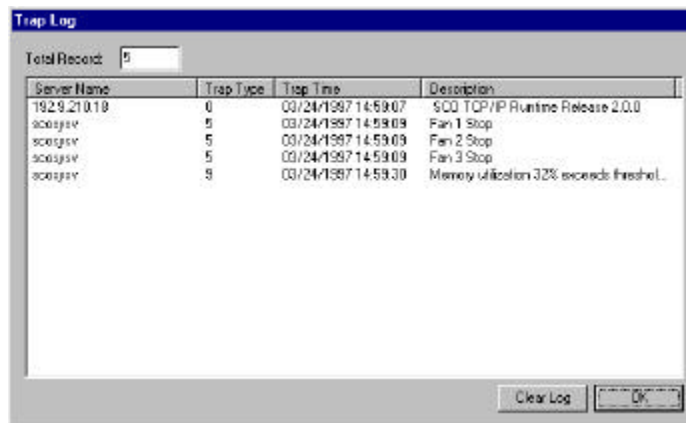
1. Open the **Event Notification Setup** window.
2. Highlight the event type using your mouse pointer.
3. Select one or more methods for the ASM Manager Station and/or ASM Server Agent by checking the appropriate item boxes.
 - If the selected Event Handling Method is a Pager, a pager number must be entered in the Pager Number box. See the instructions in the Dial to a Pager section in this chapter.
 - If the selected Event Handling Method is Agent Side Action, you must make your selection at the agent site by using the *ASM config* utility (except for the Broadcast a warning message action).

For example, in the screen shown below, the Memory Utilization High event type will display a warning dialog box at the ASM Manager Station when the agent's memory usage has exceeded its threshold value, if the Warning Dialog box is checked. The warning box appears, similar to this window:



Trap Log

The trap log window shows a list of all trap events received by the ASM Manager Station. To access the trap log window click **View** ⇒ **Trap Log**.



The screenshot shows a window titled "Trap Log". At the top, there is a "Total Record:" label followed by a text box containing the number "5". Below this is a table with four columns: "Server Name", "Trap Type", "Trap Time", and "Description". The table contains five rows of data. At the bottom right of the window, there are two buttons: "Clear Log" and "OK".

Server Name	Trap Type	Trap Time	Description
192.9.210.10	0	03/24/1997 14:59:07	SCD TCP/IP Runtime Release 2.0.0
scdgsrv	5	03/24/1997 14:59:09	Fan 1 Stop
scdgsrv	5	03/24/1997 14:59:09	Fan 2 Stop
scdgsrv	5	03/24/1997 14:59:09	Fan 3 Stop
scdgsrv	5	03/24/1997 14:59:30	Memory utilization 32% exceeds threshol...

When a hardware error has occurred or a particular threshold setting has been exceeded, the ASM Server Agent detects this condition and sends a trap to inform the ASM Manager Station. When the ASM Manager Station receives the trap, it logs the event in the Trap Log file. Log file „traplog.log“ is located in the ASM Manager Station installation directory. The Trap Log display shows the following information:

- **Server Name**

The name of the server where the error or warning event occurred. This name is the name of the server displayed in the System Listing. It will display the IP address of non-ASM agent.

- **Agent Type**

The type of the agent where the error or warning event occurred. This name is the name of the agent displayed in the System Listing. It could be System, Hardware, MIBII or other agents.

- Trap Type

The following event types are listed in the Trap Handler Set up window.

0. Trap Other than ASM
1. Temperature Warning
2. Temperature Critical
3. 1-Bit ECC Memory Error
4. M-Bit ECC Memory Error
5. Fan Stops
6. Voltage Exceeds Safe Range
8. Bus Utilization High (applies only to certain systems)
9. Memory Utilization High
10. File System Utilization High
12. UPS Power Supply Fail (applies only to certain systems)
13. UPS AC Power Fail (applies only to certain systems)
14. UPS Power Supply Fan Fail (applies only to certain systems)
15. UPS Battery Fail (applies only to certain systems)
16. Chassis Intrusion
17. Fuse Fail (applies only to certain systems)
18. Redundant Power Supply Fail (applies only to certain systems)
19. Redundant Power Supply Fan Fail (for certain systems)
20. BIOS Event Log
21. BIOS Event Log Utilization High
22. CPU Abnormal
23. Asset Change

- Trap Time

The time and date when the error or warning event occurred.

- Description

A brief description of the error or warning.

Data for the Trap Log display is stored in the ASM Manager Station directory traplog.log file. At some point this data may become outdated. To avoid long lists in the Trap Log, you can delete this file by using the **Clear Log** button. The Trap Log will then be empty until new trap or warning events are logged.



It is recommended that you make a backup of this file before deleting it.