Intel® Server Control
Installation and User's Guide

Revision History

The following table lists the current version of Intel Server Control (ISC) software. The date indicates the release of the most recent version of ISC causing the version number to change.

ISC Version	Release Date
1.8	October 1998

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A Using the Intel Server Control Console

1   Introduction to Intel® Server Control

What Is Intel Server Control?

Intel® Server Control (ISC) is a server-management tool targeted for the departmental LAN Environment, such as file, print, and/or application servers. ISC uses the Desktop Management Interface (DMI) 2.0 framework to manage Windows NT†, NetWare†, and UnixWare† server hardware components. ISC provides real-time monitoring and alerting for server hardware sensors.

ISC has two main software components:

- The managed server: ISC Server Instrumentation is installed on the NetWare, Windows NT, or UnixWare server that is going to be managed by the ISC Console software.
- The managing console: ISC Console software is installed on the user console that will manage the server.

On a Windows NT network, it is possible to install both parts of the software on the same server. It is also possible to install both the Server Instrumentation and the Console software on multiple systems.

Features

The following list summarizes the features of ISC:

- Graphical user interface
- Consolidated server health information
- Interchassis management via the Intelligent Chassis Management Bus (ICMB)
- Enterprise console support (ISC runs under HP Network Node Manager; LANDesk® Server Manager; and CA-Unicenter† TNG)
- ISC stand-alone environment
- Remote installation
- Object-oriented framework using COM and ActiveX† technologies
- RPC-based transport mechanisms
- DMI 2.0 service providers
- DMI Explorer browser

System administrators can use ISC to:

- Remotely monitor server hardware sensors
- Configure sensor thresholds
- Update the server's LCD display (if available)
- Configure, receive, and act upon alert events in the system event log (SEL)
- Configure audio or visual notifications in response to an event
- Configure options to shut down, reboot, or power-off the system automatically in response to an event

Tracking System Status

Using ISC, you are able to track system status and manage hardware conditions such as:

- Temperature
- Voltage
- Cooling fan status
- Chassis intrusion
- ECC memory
- Processor status
- Power supply status

Each of these conditions has a threshold or range of acceptable values. Default values are configured during system manufacturing. These values, along with the current readings, error status, and timer settings, can be configured and monitored through ISC. An event occurs when a parameter crosses a defined threshold. At the time an event occurs, ISC initiates the action you have configured.

For example, if the temperature reaches a level that is outside of the user-defined threshold, an event has occurred. You can configure ISC to respond to this event in multiple ways, such as:

- Display a message or sound an alert
- Shut down the server
- Record the event in a system log

You can also use ISC to view:

- System hardware inventory
- BIOS and system slot information
- Onboard Adaptec SCSI controller status
- Onboard Symbios SCSI controller status
- Onboard American Megatrends, Inc. (AMI) RAID controller status
- Onboard Intel® LAN adapter status
- Component instrumentation from previous versions of LANDesk Server Control (LSC) running under LANDesk Server Manager (LDSM)

Managing Third-Party Components, DMI, and MIF Files

ISC uses the Desktop Management Interface (DMI) to monitor components, such as hardware sensors, inventory information, and third-party instrumentation on server systems. ISC monitors the motherboard, chassis, onboard Adaptec† and Symbios† SCSI controllers, onboard AMI RAID controllers, and onboard Intel LAN adapters. ISC also manages server instrumentation available on previous versions of LANDesk Server Control (LSC) including Mylex RAID and APC UPS instrumentation.

To provide these capabilities, each DMI-enabled component must provide a Management Information Format (MIF) file, which describes the manageable attributes of that component. For example, the current reading of a temperature sensor is an attribute that could be listed in a MIF file.

The ISC Console GUI running on a local management console (Windows NT, Windows† 95, or Windows 98) can manage components on a remote managed server (Windows NT, NetWare, or UnixWare). ISC also includes a translator to allow management of the DMI-enabled component instrumentation from a remote SNMP application.

For more information on DMI, see the Desktop Management Task Force (http://www.dmtf.org) on the World Wide Web.

Getting the Latest Information and Support

ISC is frequently enhanced and updated to support new features and platforms, and to address issues discovered within the application. For updated information on such changes, see the ISC release note files (README.TXT and ERRATA.TXT). If you have questions or need help using ISC, contact your service representative.

Glossary

The following terms and abbreviations are used in this document:

Table 1.   Glossary Information

Term	Description
MIF	Management Information File, used by DMI for describing component instrumentation
MMC	Microsoft Management Console
NMI	Non-Maskable Interrupt
ONC	Open Network Computing
RAID	Redundant Array of Inexpensive Disks
RPC	Remote Procedure Call
SBE	Single-Bit Error
SCO	Santa Cruz Operation, developer of SCO UnixWare
SEL	System Event Log
SIMM	Single In-line Memory Module
SMI	System Management Interrupt
SNMP	Simple Network Management Protocol, a standard network protocol for management information
UPS	Uninterruptable Power Supply

2 System Requirements

ISC has two main software components:

- ISC Server Instrumentation software is installed on the NetWare, Windows NT, or UnixWare server to be managed by the ISC Console software.
- ISC Console software is installed on a Windows NT server or workstation, or on a Windows 95 or Windows 98 workstation, that will manage the server.

Both the managing console(s) and the managed server(s) must meet the minimum system requirements listed below.

Managed Server Requirements

ISC supports several Intel motherboards. For a complete list of supported server motherboards and qualified BIOS revision levels, see the ISC release note files (README.TXT and ERRATA.TXT). The following requirements must be met for the NetWare, Windows NT, or UnixWare managed server.

NetWare Requirements

If you intend to manage a NetWare server, you must have an account with supervisor- or administrator-equivalent rights available to you. The server must also meet the following minimum requirements:

- NetWare 4.11 or 5.0 symmetric multiprocessing (SMP), or IntraNetWare[†] 1.0
- One of the Intel® motherboards specified in the release notes
- At least 24 MB of RAM
- At least 60 MB of available disk space
- NetWare SNMP NLM installed (required only for connectivity to an SNMP management console)
- TIRPC (Transport Independent Remote Procedure Call) needs to be installed and configured before an ISC console can communicate with NetWare servers.

For a NetWare 4.11 SMP, NetWare 5.0 SMP, or IntraNetWare 1.0 OS, the following NLMs, or later versions, are necessary:

- CLIB.NLM, version 4.11
- FPSM.NLM, version 4.11
- THREADS.NLM, version 4.11
- REQUESTR.NLM, version 4.11
- NLMLIB.NLM, version 4.11
- NIT.NLM, version 4.11

Windows NT Requirements

If you intend to manage a Windows NT server, you must have an account with administrative rights available to you. The server must also meet the following minimum requirements:

- Windows NT Server 3.51 (SP 5), 4.0 (SP 3), or Enterprise Edition
- One of the Intel motherboards as specified in the release notes
- 32 MB of RAM
- 60 MB of available disk space
- Windows NT SNMP or SNMP service installed (required only for connectivity to an SNMP management console)

SCO[†] UnixWare Requirements

If you intend to manage a UnixWare file server, you must have an account with root privileges available to you. The server must also meet the following minimum requirements:

- SCO UnixWare 7
- One of the Intel motherboards supported under UNIX[†] as specified in the release notes
- 32 MB of RAM
- 60 MB of available disk space
- UNIX SNMP and ONC RPC installed

Additional Requirements for DMI-SNMP Translation

SNMP support must be installed if you want to integrate ISC with an SNMP-based management framework. For SNMP installation information, see your Windows NT, NetWare, or UnixWare documentation.

On the managed server, you should consider the following issues when configuring SNMP:

- Community string names for SNMP Get and Set operations and for sending traps
- The destination address for the management console receiving the traps

On the management console, you should consider the following issues when configuring SNMP:

- Compiling the MIBs into the SNMP management consoles
- Integration of ISC traps into SNMP management consoles

Console Requirements

The ISC Console software integrates into HP Network Node Manager, Intel LANDesk Server Manager, or CA Unicenter-TNG consoles. See ISC release notes for supported versions of these software packages. ISC also runs in a stand-alone environment. You can choose to install the stand-alone environment during Setup. If you do not choose the stand-alone environment and no management console is present, the ISC GUI software will not install.

Windows 95 or Windows 98

- Intel® Pentium® microprocessor or higher
- At least 32 MB of RAM
- At least 10 MB of available disk space

Windows NT

- Windows NT Server or Workstation 4.0
- Intel Pentium microprocessor or higher
- At least 64 MB of RAM
- At least 10 MB of available disk space

3 Installing ISC

Managed Server Preparation

ISC uses the event-logging feature of the BIOS for system management status and information. To enable this feature for each server to be managed with ISC, you must boot the server(s) using the System Configuration Utility (SCU) or System Setup Utility (SSU) and set the appropriate options under System Management Options. For motherboard-specific settings and values, see the ISC release note files (README.TXT and ERRATA.TXT).

⇒ **NOTE**

It is possible to configure temperature and voltage thresholds on the server system using the SCU or SSU. However, the thresholds set with the SCU or SSU are in effect only for a short time during the system boot process. ISC overwrites these thresholds when the OS loads. We therefore recommend that all threshold changes be made using ISC.

Compatibility and Upgrade Issues

If you have earlier versions of LSC or LDSM on your network, be aware of the following:

- Versions of LDSM with LSC prior to 2.8 are not supported under ISC.
- The ISC-managed server installation will not upgrade the DMI service provider or any DMI database that is already installed on the managed server. However, if a service provider is not found, ISC installs a DMI 2.0 service provider.
- The ISC server installation process installs the remote procedure call (RPC) transports (DCE and ONC) if they are not available on the managed server.
- The enhanced ISC GUI uses RPC transports (DCE and ONC) and DMI 2.0 commands to communicate with DMI 2.0-based managed servers. However, an LSC 2.8-based ISC GUI is used when managing a DMI 1.0-based server. This 2.8-based GUI is included in the ISC product and is automatically launched when a DMI 1.0-based server is detected. This is necessary because DMI 1.0-based servers do not support DMI 2.0 commands or RPC transports.

Beginning with version 1.8, ISC ships with the DMI 2.0s Service Provider for Windows NT. The 2.0s version is an extension of the Service Provider that supports security. ISC does not use those features, but they are available under Windows NT for possible use by other DMI 2.0s-compliant software.

The Setup Program

The Setup program installs the ISC software, the stand-alone ISC Console, and the ISC Server Instrumentation software for Windows NT and NetWare servers. To install the instrumentation software for UnixWare servers, please refer to the section "Installing to a UnixWare Server."

➡ **NOTE**

> Before running Setup, verify that you have administrative rights for all servers and consoles on which you will be installing ISC.

To start Setup:

1. Close all applications except the Windows Program Manager.
2. Run ISCSETUP.EXE. If ISC was downloaded via the World Wide Web, run INSTALL.BAT to rebuild and launch ISCSETUP.EXE.
3. Follow the Setup prompts.

The ISC Setup program configures both the Local Console and the Managed Server(s), through four installation options:

- **Local Console—** Installs and sets up the ISC console components on the local system; detects whether any supported enterprise management consoles are installed; and configures the ISC console components to launch from these management console applications. This option may be selected only on a Windows NT server or workstation, or on a Windows 95 or a Windows 98 workstation.
- **Stand-alone environment—** Installs and sets up the stand-alone ISC environment on the local server; and configures the ISC console components to launch from this application. This option may be selected only on a Windows NT server or workstation, or on a Windows 95 or a Windows 98 workstation.
- **Local Server Instrumentation—** Installs and sets up the ISC server components on the local server. This option may be chosen only on a Windows NT server.
- **Remote Server Instrumentation—** Installs and sets up the ISC server components on the selected remote servers. ISC supports a remote concurrent installation process (from a Windows NT system) by allowing you to configure drive mappings to multiple remote servers during Setup. This allows you to install ISC onto multiple remote servers at the same time. This option may be selected for either a Windows NT or a NetWare server.

Local Console Overview

Setup does the following:

- Creates necessary directories.
- Copies installation files to the Local Console.
- Registers the ActiveX controls.
- Configures the system, including registry changes.
- Configures ISC to run under HP NNM, Intel LANDesk Server Manager (LDSM) , or CA Unicenter-TNG, if these management consoles are installed.
- Configures ISC to run in a stand-alone environment if the stand-alone environment is installed.

The ISC Console software runs under Windows NT 4.0, Windows 95, and Windows 98. The appropriate GUI will run automatically depending on the DMI services detected on the managed server.

- The enhanced ISC GUI is used when DMI 2.0 services are installed.
- The 2.8-based LSC GUI is used when DMI 1.0 services are installed.

When the ISC Console is installed on a Windows NT 4.0 server, the server can act both as a Local Console and as a Managed Server if the server contains an ISC-supported motherboard and you install the instrumentation software and the Local Console software.

The ISC Console software is launched from enterprise management consoles that are detected during Setup and configured to run ISC. ISC supports these consoles during Setup (see the ISC release notes for supported versions of these software packages):

- HP Network Node Manager: Windows NT only
- LANDesk Server Manager: Windows NT and Windows 95
- CA Unicenter-TNG: Windows NT only

NOTE

> ISC also installs the DMI Explorer browser under HP-NNM, CA Unicenter-TNG, and the ISC Stand-alone environment.

Setup will automatically configure each detected enterprise management console to launch ISC. If more enterprise management consoles are installed later, you must rerun the ISC Setup program to configure the ISC Console software to run under the additional management console. If Setup does not detect any of the enterprise management consoles on the local machine or you have not chosen to install the ISC stand-alone environment, the ISC console components will not be installed.

Stand-alone ISC Console Overview

Setup does the following:

- Creates necessary directories
- Copies installation files to the Local Console
- Registers the ActiveX controls

- Configures the system, including registry changes
- Configures ISC to run in the stand-alone environment

Use the ISC stand-alone environment to manage your servers without having an enterprise management console installed on your local server. The stand-alone ISC Console runs under Windows NT 4.0, Windows 95, or Windows 98, either as an executable program, an ActiveX control inside of a 32-bit Internet browser, or inside of the Microsoft Management Console (MMC). Using the stand-alone environment, you can discover ISC-managed servers and run the ISC Console software for those managed servers.

Managed Server Configuration

Setup does the following:

- Creates necessary directories
- Verifies software dependencies and configuration
- Installs DMI 2.0 service provider if no DMI environment is detected
- Detects the motherboard and chassis type
- Copies installation files to the server
- Edits system startup files
- Sets up and configures the system, including registry changes
- Reboots the server

On NetWare servers, you must manually reboot the server to complete the ISC installation.

Local Server Instrumentation

Select this option so that Setup will install the ISC Instrumentation software directly on the server from which Setup is initiated. The option is valid for a local server running Windows NT 4.0. With this option, Setup:

- WILL upgrade the motherboard instrumentation if a previous version is found. The old instrumentation is saved in a BACKUP directory.
- WILL install the DCE RPC transport if it is not available on the local server.
- WILL NOT install any ISC server instrumentation if Setup determines that the local machine does not have a supported motherboard.

It is possible to configure both the Local Server Instrumentation and the ISC Console software on the same Windows NT server. Windows NT 4.0 servers can act both as managed servers and as ISC Consoles.

Setup checks for DMI services on the local server. Setup will not upgrade a DMI service provider or a DMI database that is already installed on the local server. If a DMI service provider is not found, ISC installs a Win32† -based DMI 2.0 service provider on the local server.

Remote Server Instrumentation

Select this option to install the ISC Instrumentation software at one or more remote Windows NT
servers, one or more NetWare servers, or a combination of Windows NT and NetWare servers.
Remote install is supported from a system running Windows NT. For UnixWare servers, refer to
the corresponding section for installation instructions. With this option, Setup:

- WILL upgrade the motherboard instrumentation. If a previous version is found, the old
  instrumentation is saved in a BACKUP directory.
- WILL install the RPC transports (DCE or ONC) if they are not available on the remote server.
- WILL NOT install the ISC server instrumentation if Setup determines that the remote machine
  does not have a supported motherboard.

You can configure remote drive mappings to servers on which you want to install the ISC server
instrumentation. Requirements:

- You must have administrator or equivalent rights for each server on which you will be
  installing the software.
- You may have to create a network share on the remote server depending on which drive or
  directory you want to install ISC onto.
- You can use your own named network share, or use the default share for the drive.

After you manually configure the remote drive mappings to your installation directory, Setup will
simultaneously install the ISC server instrumentation to each server. Setup creates a long-term
connection to the remote machine when you configure the remote drive mappings. The mapping
continues once the ISC installation is complete. You must manually delete unwanted drive
mappings.

Setup checks for DMI services on the remote server. Setup will not upgrade a DMI 2.0-based
service provider or DMI database if one is already installed on the remote server. If no DMI
service provider is found, ISC will install a Win32 or NetWare-based DMI 2.0 service provider on
the remote server.

➡ NOTE

       Servers that have a DMI 1.0-based service provider can be managed by ISC
       through a 2.8-based LSC GUI that is installed during the ISC console
       installation.

Installing on a Windows NT Server

The Setup program automatically creates directories, copies files, updates registry entries, and
configures services. Setup will reboot the server to complete installation.

Installing on a NetWare Server

Setup updates NetWare servers in two parts:

1. Files are copied to the NetWare server from the computer from which Setup is initiated.
2. After Setup has finished copying files to the NetWare server, you must reboot the NetWare server to complete the ISC installation. Following the reboot, a configuration and setup program runs at the NetWare server. The ISC configuration and setup program detects the motherboard type and installs the ISC software.

If an ISC-supported motherboard is not detected during the ISC configuration and setup process, all ISC-related files are deleted from the NetWare server. A warning message is displayed on the NetWare console indicating that ISC did not install correctly.

The ISC configuration and Setup program adds a call, ISC_ON.NCF, to NetWare's AUTOEXEC.NCF. This allows the ISC server instrumentation NLMs to automatically load with the NetWare OS. To start the ISC server instrumentation, you can manually start ISC_ON.NCF, or reboot the server to start the ISC server instrumentation automatically with the NetWare OS.

NetWare Server Customization After Running Setup

While installing ISC, the configuration and Setup program installs Adaptec and Symbios SCSI, AMI RAID, and Intel LAN Adapter instrumentation on the NetWare server but does **not** enable the instrumentation support.

To enable support for any or all instrumentation, you must edit the ISC_ON.NCF file in the SYS:SYSTEM directory.

To enable the Adaptec SCSI instrumentation, remove the word REM from these lines in the ISC_ON.NCF file:

```
REM load iomgr
REM load cio20
REM load ciodmi
```

To enable the Intel LAN Adapter instrumentation, remove the word REM from these lines in the ISC_ON.NCF file:

```
REM load intelndm
REM load intel_ni
```

To enable the AMI RAID instrumentation, remove the word REM from these lines in the ISC_ON.NCF file:

```
REM load megaci
REM load amiagent
```

To enable the Symbios SCSI instrumentation, remove the word REM from these lines in the ISC_ON.NCF file:

```
REM load symcinw
```

To enable the Mylex RAID instrumentation, remove the word REM from these lines in the ISC_ON.NCF file:

```
REM LOAD GAMDRV

REM LOAD GAMSTUBS

REM LOAD GAMSERV

REM LOAD GAMEVENT -h <IP Address>

REM LOAD RAIDBLD -s 7 -S 1 -r -R 1 -t 24 -T 0 -l sys:\public\raidbld.log

REM LOAD GAMCONFG -c 1 -t 16 -T 1111111101111111

REM LOAD GAMSETSZ -f sys:\system\mylexdrv.siz

REM LOAD MDACCI
```

Installing on a UnixWare Server

Installation for UnixWare servers must be done on individual servers locally, not by using ISC Setup.

You must be logged on as root.

The UNIX package will be installed by default in /isc directory. If you want to install it in a different directory, edit the file /var/sadm/install/admin/default, and change the value of basedir parameter to "ask" rather than "default." In this case, pkgadd will prompt for the base directory—it will create the directory isc inside that.

Mount the CD-ROM in read-only mode. To mount the CD-ROM, run "mount –rF cdfs /dev/cdrom/* /install" or, if more than one CD-ROM driver is present in the system, note the name of the driver from directory /dev/cdrom, and replace * with the driver name in the mount command.

To install the UNIX package:
1. Run "pkgadd –d /install/ISC/UNIXWARE/ISCUW.PKG". Commands are case-sensitive.
2. If the system motherboard is S450NX and if the board supports ICMB, set execute permission to the files isc/eif and isc/asyncpoller.
3. Change directory to "isc." The default path is /isc. Use the command "chmod +x eif asyncpoller."

Once the installation is complete, reboot the system. All the ISC daemons will be up and running minutes after the system is up. The daemons are dmispd, oncsp, basebrd, lra, sdlink, and sdtrap. On ICMB enabled servers, the eif and asyncpoller are optional modules as explained above.

Installing the Console on a Workstation

The Setup program installs the Local Console and the stand-alone ISC Console on a workstation. The program automatically creates the directories, copies files, updates registry entries, and configures services. Setup will reboot the server to complete installation.

You must have Administrator or equivalent rights on the workstation in order for the ISC Console programs to install properly.

Uninstalling ISC

The uninstall process differs between Windows NT, NetWare, and UnixWare.

Windows 95, Windows 98, and Windows NT 4.0

To delete the ISC components, run the Add/Remove Program function from the Control Panel on the local server, and select the following programs:

- **Intel Server Control Console**—deletes the ISC console, including the enhanced GUI and 2.8-based applet, DMI browser, and enterprise management console files.
- **Intel Server Control Instrumentation**—deletes the ISC server platform instrumentation.
- **Intel DMI 2.x Service Provider**—deletes the DMI 2.0 service provider, DMI database, and RPC transport files. **Do NOT delete this component if other DMI applications are installed on the server.**

We recommend that you reboot the server after uninstall.

Windows NT 3.51

To delete the ISC server instrumentation component, log on to the local server and run the **CIUninstall.bat** script from the %ISCPATH% directory. We recommend that you reboot the server after uninstall.

NetWare

To delete the ISC server instrumentation component, log on to the local server as a user with administrative rights, and run the following two scripts from the SYS: SYSTEM directory:

- **ISC_RM.NCF**—deletes the ISC server platform instrumentation.
- **DMI_RM.NCF**—deletes the DMI 2.0 service provider, DMI database, and RPC transport files. **Do NOT run this if other DMI applications are installed on the server.**

We recommend that you reboot the server after uninstall.

SCO UnixWare

To delete the server instrumentation, login as root. Run "pkgrm" and follow the instructions. Afterwards, reboot the machine.

4 Launching ISC

ISC can be launched from and can manage your server from one of these enterprise management environments:

- LANDesk Server Manager (LDSM)
- HP Network Node Manager
- CA-Unicenter TNG

Once the ISC GUI application is launched from an enterprise management console, the management console application can terminate, and ISC will continue to operate normally.

ISC can be launched from and can manage your server from a stand-alone ISC Console. The ISC Console can run as an executable program, as an ActiveX control within an Internet browser, or within Microsoft Management Console.

LANDesk® Server Manager

The LDSM console dynamically builds its feature set when communication is established with a managed server. If the managed server is running the ISC Component Instrumentation software, the LDSM console adds an option for "Intel Server Control" as a launch point in the Tools branch of the LDSM navigation tree. Select this option to launch the ISC applet.

HP Network Node Manager

The HP Network Node Manager Console autodetects servers running the ISC Component Instrumentation software. The Console updates the server bitmap with an ISC server icon for those servers.

To launch the ISC applet, select an ISC-enabled server on the HP Console network map, and then select the "Intel Server Control Applet" option from the Tools Menu. Alternatively, you can launch the ISC applet by selecting an ISC-enabled server on the HP console network map, clicking the right mouse button, and then selecting the "Intel Server Control" option from the popup menu.

CA-Unicenter TNG

The CA-Unicenter TNG Console autodetects servers running the ISC Component Instrumentation software if you have enabled the ISC to CA discovery service. To enable discovery, you must start the "Intel Tng-ISC AutoDiscovery" service. You can start this service from either the TNG Unicenter "Auto Discovery" dialog or from the Windows NT "Services" applet.

The "Intel Tng-ISC AutoDiscovery" service creates a new "Intel Server Control" TNG object for each server having the ISC Component Instrumentation software. That TNG object displays on the

map as a child of the "ISC World View" and as a child of the ISC-enabled server. You can view all ISC-enabled servers under the "ISC World View."

To launch the ISC applet, right-click on a "Intel Server Control" icon, and select the "Launch ISC" option from the popup menu.

Stand-alone ISC Console

Use the stand-alone ISC Console to manage ISC-enabled servers without installing an enterprise management console application. The environment is implemented as an executable program; as an application within Microsoft Management Console; or as an ActiveX control that runs within a "container" application, such as Microsoft Internet Explorer, versions 3.0 or 4.0, or Netscape Navigator, version 3.0 or 4.0.

Refer to Appendix A for details about the features supported by the stand-alone ISC Console.

Launching the ISC Console

To launch the stand-alone ISC Console in its own container, do the following:
1. From the Start Menu in Windows, select Start->Programs->Intel Server Control Tools->Intel Server Control.

Launching the ISC Console with Internet Browsers

To launch the stand-alone ISC Console within a Web browser, do the following:
1. Run the Internet Browser to be used as a "container" for the ISC Console.
2. Within the browser, choose File->Open.
3. Enter the ISC Console filename, specifying the full path to the file:
   %ISCPATH%\MI\EMC\IC\ISC.HTM

The stand-alone ISC Console will be started as the active application within the default Web browser.

Once the ISC Console is loaded, the location can be saved as a "Bookmark" (Netscape) or a "Favorite" (Internet Explorer) for easy access in later sessions.

You may also:
1. Locate the file using Windows Explorer, specifying the path:
   %ISCPATH%\MI\EMC\IC\ISC.HTM
2. Double-click on the filename to launch the control within the default Web browser.

NOTE

Netscape Navigator requires a plug-in for viewing ActiveX applications.
One that is known to work is ScriptActive[†], which available from Ncompass
Labs, Inc. (see http://www.ncompasslabs.com).

Launching the ISC Console with Microsoft Management Console

To launch the stand-alone ISC Console within Microsoft Management Console (MMC), do the following:

1. From a Start Menu in Windows or from the Start→Run selection, run MMC.
2. Within MMC, choose File→Open.
3. Enter the ISC Console filename, specifying the full path to the file:
   %ISCPATH%\MI\EMC\IC\ISC.MSC

The ISC stand-alone application will be started as the active application within MMC. You may also:

1. Locate the file using Windows Explorer, specifying the path:
   %ISCPATH%\MI\EMC\IC\ISC.MSC
4. Double-click on the filename to launch the control within MMC.

⇒ **NOTE**

If you have not installed MMC on your console system, you can obtain it from Microsoft at http://www.microsoft.com/management/mmc/.

5 Navigating ISC

When you start the ISC, the main window displays a tree view. You can expand the view to show the sensor types supported on the managed server and further expand it to display detailed sensor information.

A presentation area on the main ISC window displays current readings, threshold configurations, inventory, and other related information for selections made in the tree view. The main window also displays the server's LCD (if available) and a picture of the ISC bitmap.

Most of the ISC sensors have associated thresholds that trigger alert actions when the thresholds are crossed. You can:

- Specify which alert actions you want to occur.
- Modify the default thresholds.
- Configure the default actions and notifications for each threshold.

When a parameter crosses a threshold, you can have ISC:

- Beep the speaker on the managed server.
- Display an alert on the managed server.
- Log the event to disk on the managed server.
- Broadcast a message.
- Write a message to the LCD on the managed server.
- Use one of the shutdown/power control options to shutdown the OS, do a hardware reset, or power-off the server.
- Run any LANDesk Alert Management System (AMS[2]) alert action if LANDesk Server Manager is installed on the managed server and managing console. For more information on AMS[2], see the Intel LANDesk Server Manager Administrator's Guide.

The ISC Console Main Screen

ISC uses a Windows Explorer-like model, with a navigation pane (tree view) and a presentation pane (list view). When you select a sensor from the tree, the presentation pane shows a set of tabbed pages with sensor-specific information.
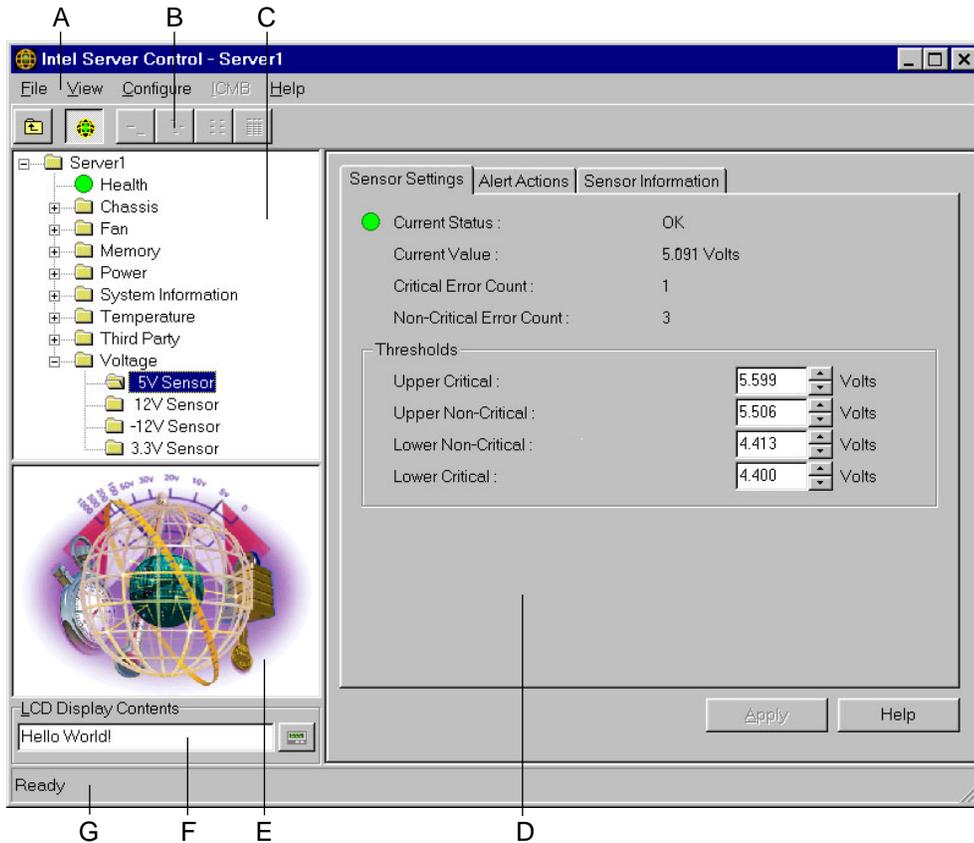
Figure 1. ISC Main Screen

A	Main Menu bar (for more details, see page 23)
B	Icon Toolbar (page 24)
C	Navigation Pane (page 30)
D	Presentation Pane (page 31)
E	ISC Bitmap (page 30)
F	LCD Display Pane (page 30)
G	Status Bar (page 30)

The main screen of the ISC application is continually updated to show current sensor status. Specific ISC sensor dialogs (such as temperature and voltage sensors) show the current sensor reading when displayed but are not dynamically updated.

Main Menu Bar

The Main Menu Bar includes the following options:

Table 2.   Main Menu Bar Items

Item	Options
File Menu	**Exit:** Exits the application
View Menu	**Toolbar:** Toggles the toolbar on or off **Status Bar:** Toggles the status bar on or off **ISC Bitmap:** Toggles the ISC bitmap pane on and off **Large Icons:** Displays list using large icons **Small Icons:** Displays list using small icons **List:** Displays items in list format **Details:** Displays items in detail format **Arrange Icons:** Arranges icons by name or status **Refresh:** Triggers an immediate screen and data refresh **Options:** Displays the view options dialog so you can configure viewing preferences such as temperature format and display refresh rate
Configure Menu	**Enable Front Panel Power & Reset:** Toggles the front panel power and reset option **Immediate Power Off (On) Server:** Immediately powers off the managed server or ICMB-managed device. If the device is powered off, this option powers it on. Power On is available only on ICMB devices **Immediate Hardware Reset Server:** Immediately resets the managed server or ICMB-managed device **Enable Watchdog Timer:** Toggles the watchdog timer option. When this option is enabled, you can set the timer value **Watchdog Timer Value:** When the watchdog timer option is enabled, the timeout dialog appears so you can set the timeout value. When the timer is disabled, the dialog does not appear **Restore Factory Defaults:** Restores factory default values for threshold sensors, console refresh interval, and the Watchdog Timer
ICMB Menu	**View Managing Server:** Enables the default local managing server view **View Managed Server(s):** Accesses the ICMB-managed server view(s) **Reclaim Inactive Resources:** Reclaims inactive ICMB resources on the managing server
Help Menu	**Help Topics:** Accesses ISC help topics **About ISC:** Displays ISC version information

Icon Toolbar

Table 3 lists the items in the Icon Toolbar. The order of the items in the table, top to bottom, reflects the order of the icons on the main screen, left to right. To hide the icon toolbar, click the right mouse button over the toolbar, and then click on the "Hide" popup menu that appears.

Table 3.   Icon Toolbar Items

Icon	Name	Options
	Up One Level	Takes you up one level in the tree (navigation) view
	ISC Bitmap	Toggles the ISC bitmap pane on or off
	Large Icons	Displays list using large icons
	Small Icons	Displays list using small icons
	List	Displays items in list format
	Details	Displays items in detail format

Navigation Pane

The Navigation Pane shows a tree view of server components that can be monitored. Many branches of the tree represent group components that have subbranches (nodes). These group items are identified by the tree expansion icons ("+" or "-") appearing to the left of the component name. These branches can be expanded to list nodes (detail sensor list) or collapsed to hide nodes.

ISC Bitmap

The ISC Bitmap shows a picture of the ISC splash screen. To hide the picture, click the right mouse button over the picture, and then click on the "Hide" popup menu that appears or click on the ISC Bitmap icon on the toolbar.

LCD Display

The LCD Display Pane shows the actual server LCD contents and a button to set the LCD contents on the server. If the server hardware does not support LCD, the pane does not display.

Status Bar

The Status Bar displays status messages. To hide the status bar, click the right mouse button over the status bar, and then click on the "Hide" popup menu that appears.

Presentation Pane

When you select a branch (group component) in the navigation pane, the presentation pane displays a set of icons (list view) representing each group node (detail sensor list). The detail view provides more information on each node item. You can arrange these list view items by name (sorted alphabetically) or by status (sorted by current status: critical, noncritical, and OK). To change the presentation pane, click the right mouse button over the pane, and then select from the popup menu that appears. This popup menu has two items:

- **View**— Changes between large icons, small icons, list, or detail view
- **Arrange Icons**— Arranges the list view icons by name or status

When you select a node in the navigation pane, the presentation pane displays a set of tab pages representing the detail sensor information. Depending on the node selected in the navigation pane, one of the following four pages is displayed:

- **Sensor Settings**— Displays the sensor's current status and current value, threshold values and error counts.

  Use this screen to configure new threshold values (such as Upper Critical Threshold, Upper Noncritical Threshold).

  The sensor status is also represented as a colored "Health" icon: Red is critical, Yellow is noncritical, and Green is OK.

- **Alert Actions**— Displays the currently configured alert actions for each threshold type (such as Voltage-Status Changed to Upper Critical, Voltage-Status Changed to Lower Critical).

  Use this screen to change the alert actions for each supported threshold. The factory default alert actions are Log the Event to Disk and Write a Message to the LCD. The AMS Alert configuration option is available only when ISC is integrated with LDSM; when this feature is not available, the AMS Alert option is disabled.

- **Sensor Information**— Displays individual sensor information (such as Sensor Tolerance, Maximum Reading, Minimum Reading).

- **Inventory Information**— Displays inventory information for the sensor (such as Description, Manufacturer). The information varies based on the sensor type.

Health of the Server

You can select the Health branch of the server tree in the navigation pane to get a quick and simple view of the current server health. Information about all unhealthy sensors is copied under the Health branch. If, for example, a 12V voltage sensor indicates that the current status is not OK, then data about that 12V sensor is added to the Health branch of the tree. You can select the 12V entry in either the Health or Voltage branch of the tree to display information about the sensor.

All sensors in either a critical or noncritical condition will appear in the Health branch of the tree in addition to their normal location in other areas of the navigation tree. In this way, you can get a quick summary of problem areas on your server and begin corrective actions.

Colored icons in the Health branch of the server tree indicate individual sensor status and overall server status:

- **Green:** healthy server
- **Yellow:** noncritical conditions
- **Red:** critical failures

The color of the overall server health icon will display the state of the most severe sensor status. If any sensor is in a critical condition (regardless of other sensors being in a noncritical condition), the server health status will be shown as critical (red). If there are only noncritical sensors, the server health status will be shown as noncritical (yellow). If all sensors report normal conditions, the server health status will be shown as OK (green).

6 Managed Components

The following sensors and components can be managed by ISC:

- Voltage Sensors
- Temperature Sensors
- Watchdog Timer
- System Fans
- Chassis Sensors
- Processor Sensors
- System Power Supply Sensors
- System Power Redundancy
- ECC Memory
- System Information
- System Event Log
- LCD
- Front Panel Power and Reset Buttons
- Power State
- ICMB
- Third-party Instrumentation

Each of these is discussed in the following sections.

Voltage Sensors

In a managed server, ISC monitors many types of voltage sensors; the number and type depend on the server hardware configuration. Each monitored voltage sensor has independently configurable thresholds and event actions. Example voltage sensors are:

- 12V, 5V, 3.5V, 3.3V, -5V, -12V
- Processors 1.5V and 2.5V
- SCSI A Termination 1, 2, and 3

If a voltage threshold is crossed, the ISC Console software displays the noncritical or critical condition via the "health branch" of the software, and the requested event actions are carried out. If a particular voltage threshold is not available on your server, this threshold setting will be grayed out, or inaccessible, in the ISC Console display.

Table 4 displays the information available for the voltage sensors.

Table 4.   Voltage Sensor Information

Item	Description
Maximum Reading	The highest reading supported on this sensor.
Minimum Reading	The lowest reading supported on this sensor.
Sensor Accuracy	The sensor's accuracy in +/- hundredths of a percent.
Sensor Tolerance (plus)	The amount of variation over the actual value that can be reported.
Sensor Tolerance (minus)	The amount of variation under the actual value that can be reported.
Sensor Resolution	The smallest unit of measurement reported by the sensor.
Nominal Reading	The expected normal reading for this sensor.
Lowest Normal Reading	The lowest normal reading of this sensor. Readings below this value indicate an abnormal condition.
Highest Normal Reading	The highest normal reading of this sensor. Readings above this value indicate an abnormal condition.

Temperature Sensors

The number and type of temperature sensors monitored depends on the managed server hardware configuration. Each sensor has independently configurable thresholds and event actions. Examples of temperature sensors include:

- I/O slot area
- Motherboard
- Processors 1 and 2

If a temperature threshold is crossed, the ISC Console software displays the noncritical or critical condition via the health branch of the software, and the requested event actions are carried out. If a particular temperature threshold is not available on your server, this threshold setting will be grayed out, or inaccessible, in the ISC Console display.

Table 5 displays the information available for the temperature sensors.

Table 5.   Temperature Sensor Information

Item	Description
Maximum Reading	The highest reading supported on this sensor.
Minimum Reading	The lowest reading supported on this sensor.
Sensor Accuracy	The sensor's accuracy in +/- hundredths of a percent.
Sensor Tolerance (plus)	The amount of variation over the actual value that can be reported.
Sensor Tolerance (minus)	The amount of variation under the actual value that can be reported.
Sensor Resolution	The smallest unit of measurement reported by the sensor.
Nominal Reading	The expected normal reading for this sensor.
Lowest Normal Reading	The lowest normal reading of this sensor. Readings below this value indicate an abnormal condition.
Highest Normal Reading	The highest normal reading of this sensor. Readings above this value indicate an abnormal condition.

Watchdog Timer

Each motherboard supported by ISC has a watchdog timer implemented in the hardware; the timer is disabled by default. You can enable this timer. When enabled, the timer continually decrements to test the response of the server operating system. Under normal operating conditions, the timer will be periodically reset by the ISC server instrumentation software to prevent it from reaching a value of zero. If the OS hangs, the timer will count down to zero.

If the timer reaches a value of zero, indicating an OS hang, the watchdog timer will reset the system. The default timer value is two minutes with minimum and maximum allowable settings of two to sixty minutes.

System Fans

ISC monitors two types of fans:

- Rotation-sensing fans—ISC can detect whether a fan has stopped but is not able to indicate which fan has failed. These fans, together, are treated as a single fan unit. Therefore, event actions must be configured for all fans together, rather than separately.
- RPM-sensing fans—ISC can detect whether an individual fan has either slowed or stopped and will display the actual fan RPM value for systems that support this feature. Each RPM-sensing fan is independently configurable with its own threshold and event actions.

If a rotation-sensing fan fails or an RPM-sensing fan crosses a threshold, the ISC Console software displays the event as a critical condition via the health branch of the software, and the requested event actions are carried out.

For systems that do not support a fan RPM threshold, the threshold setting displays a "0" and is read-only in the ISC Console display.

Chassis Sensors

ISC monitors chassis door open/closed switches for managed servers that support this feature. The number of sensors monitored depends on the server chassis.

When a chassis door that includes an open/close switch is opened, the vulnerable state is indicated as a critical condition in the health branch of the ISC Console software, and the requested event actions are carried out. When all chassis doors that include an open/close switch are closed, ISC indicates the chassis is secure and carries out the requested event actions.

For systems that do not support chassis open/closed switches, this portion of the ISC Console software will either not display or the chassis status will be reported as "Unknown."

Processor Sensors

For motherboards that support it, ISC monitors processor failures during runtime and system boot on the managed server. If a supported motherboard includes multiple processors, each processor can be configured and monitored separately through ISC. If a processor failure is detected, the

failure is reported as a critical condition in the health branch of the ISC Console software, and the requested event actions are carried out.

If processor sensors are not available on the motherboard, this portion of the ISC Console software does not display.

System Power Supply Sensors

For systems that support it, ISC monitors the status of the power supplies in the managed server. Each power supply is independently configurable for event actions upon failure.

If a power supply reports a predictive failure condition, then ISC reports the status as a non-critical condition in the health branch of the ISC Console software, and the requested event actions are carried out.

If a power supply fails, the failure is reported as a critical condition in the health branch of the ISC Console software, and the requested event actions are carried out. ISC also reports the system power as nonredundant and as a noncritical condition in the health branch of the ISC Console software, and the requested event actions are carried out.

For systems that do not support power supply sensors, this portion of the ISC Console software will not display.

System Power Redundancy

For those systems that support it, ISC monitors the managed server's system power redundancy status.

If a power supply fails or if the surplus power on the system is less than the amount provided by one power supply, ISC reports that the system power is Non-redundant. This condition is indicated with a noncritical status in the health branch of the ISC Console software and the requested event actions are carried out.

For systems that do not support system power redundancy status, this portion of the ISC Console software does not display.

ECC Memory

ISC reports memory status information, both memory arrays and memory devices, for systems that support ECC memory. The ECC memory subsystems can detect and report both single-bit errors (SBE) and multiple-bit errors (MBE).

Depending on the managed server hardware, memory devices are either SIMMs or DIMMs. Memory device references use the appropriate device name in the ISC Console software.

Single-Bit Error Handling

If an SBE occurs, the system generates an SMI that allows the BIOS to log information about the error in the System Event Log (SEL). This information identifies the exact SIMM or DIMM in which the error occurred. Because this condition is recoverable, the BIOS returns the system to normal operation after logging the error.

This error is indicated in the health branch of the ISC Console software as a noncritical condition, the requested event actions are carried out, and a noncritical error count is incremented on the Sensor Settings tab page of the software.

Also, the following actions occur in the ISC Console software:

- The Device Error Type is set to SBE on the Sensor Information tab page for the Memory Device
- The Last Error Update value is set to "During ISC Runtime," indicating the update occurred while the system was operational.

The BIOS stops logging noncritical SBEs when the SBE error count reaches nine. This prevents the errors from filling the SEL. Upon system reboot, the OS uses the SEL records, along with the results from its own memory test, to map out bad memory by reducing the usable size of a memory bank to avoid using the bad memory element(s). This elimination of hard errors is a precaution that prevents SBEs from becoming MBEs after the system has booted, and also to prevent SBEs from being detected and logged each time the failed location(s) are accessed. Upon reboot, the SBE error count is set to zero in the SEL.

Multiple-Bit Error Handling

If an MBE occurs, the system generates an SMI that allows the BIOS to log information about the error in the SEL, identifying the memory bank in which the error occurred. However, on some systems, it is not possible to determine the exact SIMM/DIMM that caused an MBE.

Because an MBE is a critical condition, upon logging the error the BIOS generates an NMI that halts the system. Upon rebooting the server, this error is indicated as a critical condition on the Memory Array and Memory Device in the health branch of the ISC Console software. The requested event actions are carried out, and the critical error count is incremented on the Sensor Settings tab page of the software.

Also, the following actions occur in the ISC Console software:

- The Device Error Type is set to MBE on the Sensor Information tab page for the Memory Device.
- The Last Error Update value is set to Previous Boot, indicating the last update occurred during the last system boot.

Memory Tables

Tables 6, 7, and 8 compare the steps taken with Single-bit and Multi-bit errors and provide the type of memory information available from the ISC Console software.

Table 6.   SBE and MBE Comparison

Memory Error Handling	SBE	MBE
Generate SMI	Yes	Yes
Log information includes	Exact SIMM or DIMM	Memory bank only
Action after SEL logging	Continue operation	Stop the system
Indicated by ISC screen changes	Immediately	After the system reboots
Bad memory is mapped out at next reboot	Yes	Yes (immediately after the failure)

Information available on the Sensor Information tab page of the ISC Console software:

Table 7.   Memory Array Dialog

Item	Description
Maximum Memory Capacity	The maximum memory capacity in bytes on this system
No. of Memory Device Sockets	The number of memory device (SIMM/DIMM) slots or sockets available in this memory array
No. of Memory Device Sockets Used	The number of slots or sockets populated by the memory devices in this memory array
Memory Error Correction	The hardware error correction or detection method supported by this memory array
Memory Array Location	The physical location of the memory array, whether on the motherboard or an add-on board

Information on the Sensor Information tab page of the ISC Console software:

Table 8.   Memory Device Information

Item	Description
Size	Size of the memory device in bytes.
Memory Type	Type of memory used in the memory device.
Device Locator	A string identifying the socket location or board position of the memory device. Example: "SIMM 3" or "IC12."
Device Error Type	Most recent type of error that occurred on the memory device.
Last Error Update	System state during the last error update.
Total Width	Total width of the memory device (SIMM/DIMM including check bits), in bits.
Data Width	Data width of the memory device in bits.
Type Detail	More information about the memory device type.
Error Count	Summary of the error status for the memory device. This read-only attribute contains a count of all SBEs on the memory device.

System Information

ISC gathers information on field replaceable unit (FRU) components installed in your managed server. This information includes a component description, manufacturer, model, part number, component number, serial number, and revision level. ISC also gathers information on other system resources including Operating System, BIOS, System Slots, and the System Event Log.

If your server does not support one or more of these features, these portions of the ISC Console software will not display.

System Event Log

The ISC Console software displays the System Event Log (SEL) maintained by the managed server's platform hardware. The SEL is a collection of log entries stored in nonvolatile flash memory. The entries are reported by the BIOS SMI handler when an event condition occurs at the server.

The ISC Server Instrumentation automatically extracts event information from the SEL and triggers any user-configured actions associated with that event. The ISC Server Instrumentation clears the SEL when it is near an out-of-space condition. The ISC Console software also displays the SEL logging status (whether the SEL is Active or Inactive).

The SEL information is reported only on managed server hardware platforms that support a SEL.

LCD

ISC displays the contents of the system LCD and allows changes to the LCD's contents. If your chassis does not support this feature, ISC does not report this information.

Front Panel Power and Reset Buttons

Through the ISC, you can enable or disable the power and reset buttons on the front panel of the managed server chassis. The buttons are enabled by default. This feature is disabled for servers that do not support it.

Power State

Through the ISC, you can do an immediate power-off or hardware reset of the currently managed server or ICMB-managed device. You can also do an immediate power-on if the ICMB-managed device is in a powered-down state.

ICMB

The Intelligent Chassis Management Bus (ICMB) feature allows multiple remote devices to be interconnected and management information shared among them. For example, your managed server could be configured to be an ICMB primary server and report management information on other ICMB devices connected to it. Using ICMB, ISC can manage the power state of remote ICMB devices and view FRU information about those devices. The amount of FRU information available depends on the type of ICMB device you are trying to manage.

Through the ISC Console software, you can switch your view of the primary managed server to one of the ICMB-managed devices and view the available information on that device without losing the connection with the primary server. You can change your view back to the primary server or any other ICMB-managed device at any time. Through the ISC Console software, you can configure the ICMB management features of the primary managed server and the remote ICMB managed devices.

- **Local ICMB Server Configuration—** With this option it is possible to enable the local server as a management point, enable the full sensor view of remote devices, and change the discovery period for remote devices.
- **Remote ICMB Chassis Configuration—** With this option it is possible to configure each remote device discovered via ICMB. You can decide whether to manage the remote device, enable full sensor view for the remote device, and set the event polling rate for the remote device.

You can reclaim inactive ICMB system resources on the primary server. Doing so frees the memory taken up by the SDR and FRU information on the primary server for any remote device that is no longer visible on the network (via ICMB).

Third-Party Instrumentation

You can configure event actions for DMI indications generated by third-party Server Instrumentation installed with ISC. You can also monitor third-party instrumentation via the DMI Explorer Interface. ISC supports event configuration for Adaptec SCSI, Symbios SCSI, AMI RAID, and Intel LAN Adapter Server Instrumentation.

7 Working in ISC

Viewing / Configuring Sensor Information

To view or configure a sensor (such as voltage, temperature), do the following steps:

1. On the ISC main window, click beside a sensor name in the navigation pane to see the list of available sensors.
2. Select an entry from the list.
3. Switch between the available tab pages (**Sensor Settings, Alert Actions, Sensor Information** or **Inventory Information**) to view or update the information.
4. Click <Apply> for any changes made to the sensor configuration.

At any time you can change views to another sensor by selecting another component in the navigation pane.

If you try to change your view and you have not saved any configuration changes using the Apply button in the presentation pane, ISC prompts you to save or discard the changes before switching to a new view.

Viewing System Information

To view system information (such as FRU, Operating System, BIOS, SEL) on the managed server (or managed ICMB device), do the following steps:

1. On the ISC main window, click beside the System Information name in the ISC navigation pane to see the list of options.
2. Select an entry from the list.
3. View the information in the corresponding tab page in the presentation pane.

At any time you can change views to another sensor by selecting another component in the navigation pane.

On components that support FRU data, this inventory information is also displayed on the Inventory Information tab page associated with that component.

Configuring Thresholds

There are two basic types of threshold:

- **Range-based thresholds** for which a variety of values can be set. Example uses: for temperatures, voltages, and RPM-sensing fans.
- **State-based thresholds** that have fixed values like OK or Critical. Example uses: for rotation-sensing fan, chassis door, and memory array.

To Configure a Range-Based Threshold

Most voltage and temperature sensors and RPM-sensing fans have either one, two, or four configurable thresholds, depending on the motherboard in your server. Example thresholds are:

- Upper Critical
- Upper Noncritical
- Lower Noncritical
- Lower Critical

Some special sensors do not have configurable thresholds and are displayed for monitoring purposes only.

You can customize the threshold value to suit your working environment.

You can specify what action should occur when the sensor detects that one of the threshold values has been crossed (i.e., the sensor state changes). Example state change conditions:

- Status Changed to OK
- Status Changed to Upper Critical
- Status Changed from OK to Upper Noncritical
- Status Changed from Critical to Upper Noncritical

These thresholds and sensor state changes let you configure progressive responses in ISC to increasingly serious hardware conditions. For example, noncritical thresholds might be configured to emit a beep from the speaker and send a broadcast message, while critical thresholds might require more serious actions, like a server shutdown.

To configure a range-based threshold:

1. On the ISC main window, click beside the sensor name in the navigation pane to see the list of available sensors.
2. Select an entry from the list.
3. Change the threshold values as needed on the Sensor Settings tab page.
4. Click <Apply> for any changes made to the threshold value configurations.
5. If you want to change the event actions associated with threshold state change conditions, make the changes on the Alert Actions tab page.
6. Click <Apply> for any changes made to the alert action configuration.

⇒ **NOTE**

> After applying new threshold values that may cause an event indication, the sensor status icon displayed on the Sensor Settings tab page may not change. The console refreshes the display before the new threshold value takes effect on the server, making it appear as though the sensor icon does not accurately reflect the current state of the sensor. Use the menu option, View->Refresh, or the F5 keyboard shortcut, to update the Sensor Settings tab page.

To Configure a State-Based Threshold

The state-based thresholds for processor, power supply, rotation-sensing fans, chassis door, and memory arrays have a fixed set of values, not a range. Example state change conditions:

- Single Bit Memory Error
- Processor Thermal Trip
- Power Supply Failed

⟹ **NOTE**

> For systems that support rotation-sensing fans, the fan RPM threshold setting displays a "0" and is read-only in the ISC Console software.

ISC generates an event whenever the state of these items changes. You can specify which actions should occur in response to changes. To configure a state-based threshold:

1. On the ISC main window, click beside a sensor name in the navigation pane to see a list of available sensors.
2. Select an entry from the list.
3. Select the Alert Actions tab. Change the event actions associated with a state change condition.
4. Click <Apply> to save your changes.

Cautions in Setting Thresholds

Threshold Values Rounded Off

When you are setting thresholds, the values you enter might not be the exact values set by the software. This behavior is caused by hardware rounding. Redisplay the Sensor Settings tab page to find the actual value set by the software.

Avoiding a Power On/Off Loop

Improperly setting event actions can cause the server to enter a state that prevents the server from booting correctly. This can occur in the following scenario:

1. An event occurs. Example: a high-temperature threshold is exceeded.
2. While the condition causing the event still exists, you set a Shutdown/Power Control Action, like Immediate Power Off, to respond to this event.
3. Because the threshold has already been exceeded, no event is triggered to cause the Immediate Power Off action to occur.
4. If you reboot the system and the event condition has not been corrected (such as the temperature is still over threshold), the system detects the temperature condition, triggers the event, and the corresponding action is taken. In this example action, Immediate Power Off, the system is automatically and immediately powered off.

When the system is powered up, an infinite loop of power-up and power-down begins. To break this cycle, you have two options:

1. Clear the event condition (cool down the system in this example).
2. Create a file named C:\LRA.NOT (or insert a diskette with file \LRA.NOT in A: drive) before the OS boots. The existence of this file will disable the software component that responds to the event. The contents of the file are not important. This file can be created by booting DOS. You must then delete this file after the problem is fixed to allow the software to operate normally. On UnixWare systems, either create a LRA.NOT file in / (root) directory or use the diskette described above.

Avoiding a Reboot-Fail Retry Loop

User-defined threshold values and other user-defined configuration attributes are written to disk (persistent storage) so they are available when the server reboots. These "remembered" values replace the ISC default values when ISC initializes.

When you change a threshold value or alert action in ISC, you can create an environment in which an event is immediately generated, such as setting the Upper Noncritical Threshold value below the current sensor reading. If the configured event actions on this threshold included a Shutdown or Power Control action as described earlier, the server would trigger the Shutdown or Power Control action and could enter a reboot-fail-reboot-fail cycle using the new threshold value.

To help avoid this situation, ISC updates the server in two steps:

1. Any change you make is valid immediately in the active instrumentation, but ISC waits five minutes before writing user changes to disk. Thus, if the change causes the server to reboot, the previous value is restored from disk when the server reboots.
2. ISC then uses and displays the previous value, thus avoiding the immediate reboot-fail-reboot-fail cycle.

Any change you make will be successfully written to disk as long as the motherboard instrumentation continues running for five minutes after the change is saved.

Configuring Threshold Event Actions

On the Alert Actions tab page, you can select actions that will take place when a sensor exceeds a threshold or changes state. Several options exist.

- Local actions:
    — Audio/visual notifications (you may select more than one)
    — Shutdown/power control actions (you may only select one)
- Network actions:
    — AMS[2] actions (if LANDesk Server Manager is installed on the server and console). Generally, audio/visual notifications and AMS[2] alerts are for noncritical thresholds; shutdown/power control actions are for critical thresholds.

AMS^2-configurable alert actions include:

- Paging
- Program execution
- SNMP trap generation
- Message box, broadcast, and others

For more information on AMS^2 and its alert actions, see "Configuring AMS^2 Alert Actions" in the Intel LANDesk Server Manager Administrator's Guide.

⚠ CAUTION

If the OS is disabled by a non-critical event action (such as configuring an OS shutdown action for a voltage surge), then critical actions will not be carried out because the OS has been shut down. It is best to use warnings (such as a speaker beep, a broadcast, etc.) for non-critical conditions.

The following tables list the available actions in ISC. You can specify multiple audio/visual notifications and AMS^2 alerts per event but only one shutdown/power control action.

Table 9.   Audio/Visual Notifications

Action	Description
Emit a beep from the managed server's speaker	Speaker emits a beep.
Display an alert message on the managed server	Default action for noncritical and critical indications. The message box stays up until acknowledged.
	On UnixWare, the alert message is displayed as a text message on the server console.
Log the event to disk	Default action for all indications. This option records the event in the standard system error log.
	On NetWare, ISC records the event in the System Log, which you can view with NetWare's Syscon utility.
	On Windows NT, ISC records the event in the Application Event Log, which you can view with the Windows NT Event Viewer.
	On UnixWare, events are logged in the system log file: /etc/.osm.
Broadcast a message	Default action for critical indications.
	On NetWare, the message goes to all users currently logged into the managed server with Administrator or Supervisor privileges.
	On Windows NT, the message goes to all the users currently logged into the managed server.
	Note: Win95/98 cannot receive network broadcast messages from Windows NT. If you configure a broadcast message and it is triggered on an NT server, the message will not be received by any Win95/98 systems.
	On UnixWare, a text message is sent to all users currently logged onto the UNIX server.
Write a message to the managed server's LCD	Default action for all indications. If the LCD is not available on the managed server, this option is grayed out and disabled.

Table 10. Shutdown/Power Control Actions

Action	Description
No shutdown	Default action for all indications. Select this option if you do not want to shut down or reset the server when an event occurs.
Shutdown the OS	Select this option if you want to shut down the OS gracefully (controlled, closing files and applications). On NetWare, the server is returned to DOS. On Windows NT, the server is set to a state ready for manual power-off or reset. On UnixWare, standard shutdown is completed and system prompts for reboot or power off.
Shutdown the OS and power off	Select this option if you want to shutdown the OS gracefully and turn off the system power.
Shutdown the OS and hardware reset	Select this option if you want to shutdown the OS gracefully and reset the server via hardware.
Immediate power off	Select this option if you want to immediately power down the server. This action is an immediate power-off without a shutdown of the OS; it might corrupt files.
Immediate hardware reset	Select this option if you want to immediately reset the server via hardware. This action is an immediate hard reset without a shutdown of the OS; it might corrupt files.
Immediate NMI	Select this option if you want to cause a hardware Non-Maskable Interrupt (NMI). If this feature is not supported on the managed server, this option is grayed out and disabled.

Procedure:

1. On the ISC main window, click beside a sensor name in the navigation pane to see the list of available sensors.
2. Select an entry from the list.
3. Select the Alert Actions tab.
4. Select the threshold type or state change condition.
5. Change the event actions associated with the selected threshold type or state change condition.
6. Click <Apply> to save your changes.

Configuring Third-Party Event Actions

On the Alert Actions tab page, you can select actions that will take place when a third-party component exceeds a threshold or changes state.

You can configure event actions for the following third-party components:

- Adaptec SCSI
- Symbios SCSI
- AMI RAID
- Intel LAN Adapter
- Mylex RAID (supported on servers running previous versions of LDSM)
- APC UPS (supported on servers running previous versions of LDSM)

To configure event actions for third-party indications:

1. On the ISC main window, click beside the third-party component name in the navigation pane.
2. Update the Alert Actions tab. Change the event actions associated with a threshold type or state change condition.
3. Click <Apply> to save your changes.

The following table provides event information for third-party component instrumentation supported by ISC.

Table 11.   Configurable Third-Party Events

Instrument (Notes)	Choices
Adaptec SCSI*	**Storage Device Events** Storage device member marked down Storage device recovered error - Bad block repaired Storage device state information **Storage Controller Events** Storage Controller state information Storage Controller SMART event Storage Controller status unacceptable **Volume Set Events** Volume set state information Volume set recovered error Volume set Array status - offline **Spare Events** ARO spare not functional **Enclosure Events** Enclosure state information
Symbios SCSI*	**Storage Device Events Group:** Self-Monitoring Warning (predictive failure—data recovery possible) Self-Monitoring Warning (predictive failure—data recovery questionable) **Storage Controller Events Group:** Storage Controller Error (not responding)
AMI RAID*	**Physical Drive Alerts Group:** Physical drive state change, noncritical (drive online) Physical drive state change, critical (drive failure) Physical drive rebuild started Hot spare created
Intel LAN Adapter	**Indication Control Group:** Total transmit errors threshold Total receive errors threshold Total host errors threshold Total wire errors threshold

Continued

Table 11.   Configurable Third-Party Events (continued)

Instrument (Notes)	Choices
Mylex RAID*	**Controller Information Group:** Rebuild in progress Rebuild completed Rebuild failed New drive failed Source drive failed Rebuild failed Bad blocks on source drive Errors when flushing cached data to disks Hot spare replacement table is full Device change list is full **Physical Drive Information Group:** Dead Dead (no autoreplacement within 30 sec) Rebuilding hot spare drive
APC UPS	**Battery Status:** Unknown Battery normal Battery low

*   Event actions do not distinguish between instances of the same group. This means that event actions are configured for
     a "class" of objects (i.e., host adapter) and not on individual instances of the group (i.e., host adapter 1, host adapter 2).

Switching Views Between the Primary (Managing) Server and an ICMB Device

To view a different server (ICMB device) in the navigation pane of the ISC main window, do the following steps:

1. On the ISC Main Menu Bar, click the ICMB->View Managed Server(s) menu selection.
2. A list of ICMB devices is displayed. Select an entry from the list to view.
3. Click <OK>.

The tree in the navigation pane is replaced with information about the new device. At any time you can change views to another ICMB device by repeating the steps above.

To return your view to the primary server in the navigation pane of the ISC main window, click the ICMB->View Managing Server menu selection on the ISC Main Menu Bar.

Configuring ICMB on the Primary (Managing) Server

To configure ICMB on the primary (managing) server, do the following steps:

1. On the ISC Main Menu Bar, click the ICMB->View Managing Server menu selection to switch to the primary server if you are viewing an ICMB device.
2. In the ISC navigation pane, click beside the ICMB component name in the navigation pane.
3. Update the ICMB tab page.
4. Click <Apply> for any changes made to the ICMB configuration.

Powering Off the Managed Server or ICMB Device

To immediately power down the currently managed server or ICMB device, do the following steps:

1. On the ISC Main Menu Bar, click the Configure->Immediate Power Off Server menu selection.
2. Update the confirmation dialog.
3. Click <OK>.

⚠ **CAUTION**

> This option is an immediate power-off without a shutdown of the OS, and it might corrupt files. Performing this action on the primary (managing server) will terminate your ISC session. Performing this action on a ICMB-managed device will change the power state of the device, but ISC will continue to run. You can then power-on the ICMB-managed device, or change your view to another server.

Powering-on the Managed ICMB Device

To power-on the currently managed ICMB device that is in a powered-down state, do the following steps:

1. On the ISC Main Menu Bar, click the Configure->Immediate Power On Server menu selection.
2. Update the confirmation dialog.
3. Click <OK>.

Resetting the Managed Server or ICMB Device

To do an immediate hardware reset of the currently managed server or ICMB device, do the following steps:

1. On the ISC Main Menu Bar, click the Configure->Immediate Hardware Reset Server menu selection.
2. Update the confirmation dialog.
3. Click <OK>.

⚠ **CAUTION**

> This option is an immediate hardware reset without a shutdown of the OS, and it might corrupt files. Performing this action on the primary (managing server) will terminate your ISC session. Performing this action on a ICMB-managed device will reset the device, but ISC will continue to run. You can continue managing that device, or change your view to another server.

Configuring the Watchdog Timer Value

To configure the watchdog timer value, do the following steps:

1. On the ISC Main Menu Bar, click the Configure->Watchdog Timer Value menu selection.
2. Update the timer value.
3. Click <OK>.

Customizing ISC Administrator Options

ISC has several adjustable options. You can set the ISC console refresh rate, determining how ISC is updated with current information. You can specify whether temperatures display in Celsius or Fahrenheit, and whether you want to restore ISC settings to the factory defaults.

ISC installs with the following defaults:

- ISC console refresh interval: 15 seconds
- Temperature display format: Celsius
- Watchdog feature: off
- Watchdog timer: two minutes
- Sensor threshold values as defined in the SDR file

To configure the refresh interval or temperature display format:

1. On the ISC Main Menu Bar, click the View->Options menu selection.
2. Change the refresh interval or temperature display format on the Options dialog.
3. Click <OK>.

To restore default ISC settings for threshold values, console refresh interval, and the watchdog feature:

1. On the ISC Main Menu Bar, click the Configure->Restore Factory Defaults menu selection.
2. Click <OK> on the confirmation dialog.

NOTE

Event actions you have configured and the temperature display format are not affected by the Restore Factory Default option.

CAUTIONS

Indications may be generated if the restore of the default threshold value crosses the current sensor value. For example:

User defined threshold limit 13.5 V

Current sensor value 13.0 V

Default threshold value 12.5 V

When you select the Restore Default Settings action, threshold restore may cause a threshold crossing. In the above example, ISC would detect a threshold crossing and generate an indication. The actions associated with that indication would occur. To avoid the possibility of unwanted indications when restoring default settings, Intel recommends, for each sensor where you do not want indications, that before you select the Restore Default Settings action, you adjust the user-defined threshold value so the current sensor value is NOT between the user-defined threshold value and the default threshold value.

8 Managing via DMI

The DMI Service Provider runs on each managed Windows NT, NetWare, or UnixWare server and stores the various MIF files in a database. The service provider manages component information by collecting it from the MIF database and component instrumentation code. The service provider then passes the information to the DMI browser or other management applications upon request. Any changes made by the management application or DMI browser are set via the service provider. The service provider either writes changes to the MIF database or changes attribute values via component instrumentation code.

Each DMI component must provide a MIF file. Some of the attributes listed in the MIF files are read-only, so you can view only their current values. Other attributes are read-write. For example, the Adaptec SCSI controller instrumentation's Poll Devices attribute is read-write. Changing the value of this attribute through a DMI browser changes the setting in the instrumentation software. Whether attributes are read-only or read-write depends on whether the component has instrumentation code to enable DMI to change its value.

ISC installs component instrumentation and MIF files for the following:

- Baseboard
- ICMB
- Local Response Agent
- Adaptec SCSI
- Symbios SCSI
- AMI RAID
- Mylex RAID
- Intel LAN Adapter
- APC UPS

To manage the third-party component instrumentation and MIF files, use the DMI Explorer browser.

⚠ **CAUTION**

> Use ISC, not the DMI Explorer browser, to view or set attributes for the Baseboard and Local Response Agent MIF components. ISC hides some complicated interactions of attribute data. Modifying this data inadvertently by using the DMI browser interface might cause unpredictable results and make system recovery difficult.

Using the DMI Explorer Browser to Manage Components

Installation

The DMI Explorer Browser is installed automatically when ISC is installed into systems with an Enterprise Management Console (such as HP's Network Node Manager or CA—Unicenter TNG) or the ISC Stand-alone environment. The Browser is not installed with LANDesk Server Manager.

Starting the DMI Explorer

The DMI Explorer Browser appears as an applet in the Enterprise Management Console or as a supported tool under the ISC Stand-alone environment.

Viewing Attributes

You can use DMI Explorer to view attribute values for each DMI-compliant component. To view the attributes:

- In the left pane, select the component and group you are interested in. The attributes and values appear in the right pane.

To navigate through a table of attribute values:

- To move to the next row in the table, click the Next Row button on the toolbar.
- To move to the first row in the table, click the First Row button.
- To search the table for a specific row, click the Search Row button.

NOTE

> You may see the number 2147483648 when viewing attribute information with DMI Explorer. This number is equivalent to 80000000 hex, which indicates that the item is unsupported.

Refreshing Attributes

Attribute values change from time to time. Whenever you select a group or display a new row in a table, DMI Explorer displays a "snapshot" of the data that is accurate at that time.

You may want to refresh the information manually if you suspect that it might have changed. To refresh the data:

- Click View->Refresh.

Viewing Properties

You can use DMI Explorer to view properties for the computer, components, groups, or attributes.
To display properties:

1. Select the item you're interested in.
2. Click Properties.

Setting The View Options

DMI Explorer offers several different view options.

To turn the toolbar on or off:

- Click View->Toolbar.

To turn the status bar on or off:

- Click View->Status Bar

To change the view of the right pane:

- Click View->Large Icons, Small Icons, List, or Details.

To sort the items in the right pane in a different order:

- Click View->Arrange Icons and select the text that corresponds to the column you want to sort by.

Or:

- Click the button above the column.

NOTE

> All of the options above are available by right-clicking while the cursor is over white space in the right pane.

To specify whether each view is displayed in a single window or separate windows:

1. Click View->Options.
2. Click the Browsing Format tab.
3. Choose the display format.
4. Click OK.

To change the view of integer values to hex or decimal format:

1. Click View->Options.
2. Click the Attribute Format tab.
3. Choose a display format.
4. Click OK.

Modifying Attribute Values

Attribute values for DMI components either reside in the MIF database or are calculated by instrumentation. Instrumentation consists of executable or overlay files used to obtain and/or change attribute values. You can modify values for read-write or write-only attributes.

To modify an attribute value:
1. Double-click the attribute name.
2. Place the cursor in the edit box and enter the new value.
3. Click OK.

Adding and Removing Components

You can use DMI Explorer to manage third-party DMI-compliant components. To do this, you must install the third-party MIF file. When you install an MIF file, a component is added to the DMI-Compliant Components list. Components can only be installed locally.

To add a component:
1. Select the computer icon in the tree pane.
2. Click File->Add->Component.

When you no longer want to manage a component using DMI Explorer, uninstall it. This removes the component MIF file from the MIF database and the DMI Explorer.

To remove a component:
*   Select the component and click File->Remove.

Changing the DMI Language

Use the DMI Language Selection option to change the default DMI language encoding to Unicode or ISO8859-1. If the framework fails to identify the DMI language encoding of a component, it automatically uses the default DMI language coding.

To change the DMI language selection:
1. Click View->Language.
2. Choose the language from the list of languages.
3. Click OK.

9 Third-Party Component Instrumentation

This section describes the available MIF information for third-party component instrumentation.

Adaptec SCSI

The table on the following page lists the Adaptec SCSI instrumentation available in ISC. You can view and configure the Adaptec SCSI attributes through the DMI browser interface.

Adaptec SCSI instrumentation supports event generation.

The Windows NT CIOArrayManagement service periodically writes to the following log file: %WIN32DMIPATH%\BIN\IOMGR.LOG. The service updates this log file during a discovery or polling scan for SCSI devices.

You can change the frequency of these scans by updating the DiscoveryInterval and PollInterval options in the %WIN32DMIPATH %\BIN\IOMGR.INI file. To specify new time intervals (specified in seconds) for these scans, change the following options:

```
DiscoveryInterval=1800
```

```
PollInterval=180
```

Shorter time intervals cause the instrumentation to react quicker to changes in SCSI devices, but shorter intervals increase the system overhead and make the log file grow faster. You can delete the IOMGR.LOG file at any time without affecting the CIO Array Management service. Adaptec's monitoring of drive 'health' is dependent on the OS's SCSI bus device discovery and auto-assignment of SCSI IDs for discovered logical units at system hardware boot time. Any logical units assigned SCSI IDs at system boot time will be detected by Adaptec's instrumentation initialization 'SCAN' and registered for the polling cycle check performed every PollInterval seconds. A device without a SCSI ID is not detected by the SCAN function and is not registered for the Adaptec health check. Every DiscoveryInterval, a 'SCAN' is initiated to verify the health of all devices that are known to the operating system. Any failed device will be dropped from the list of devices to POLL. Every PollInterval, a 'POLL' is initiated to verify the health of known 'good' devices. Typical SCSI devices (logical units) monitored are drives and back-planes.

If a device fails, the SCAN or POLL cycle will detect that it has failed and generate a failed event. A failed device can be replaced by a new device (or reinserted) in the same physical slot. A SCAN will find this new device and generate a device-recovered event.

You can initiate a new SCAN or POLL by setting the Scan Devices or Poll Devices attribute in the Operation Group in the Adaptec MIF.

New devices inserted in previously unoccupied or undetected slots (no SCSI ID assigned) will only be detected by the OS during system hardware boot. Once these 'new' devices have a SCSI ID, they will be monitored by the Adaptec instrumentation.

Table 12. Adaptec SCSI Information Available in ISC

Item	State	Item	State
Component ID		**Storage Devices Events** **Enclosure Events** **Storage Controller Events** **Bus Port Events** **Volume Set Events** **Volume Set Activity Events** **Redundancy Group Events** **Spare Events** **Association Events**	
Manufacturer	RO	Event Type	RO
Product	RO	Event Severity	RO
Version	RO	Event is State-Based	RO
Serial Number	RO	Event State Key	RO
Installation	RO	Associated Group	RO
Verify	RO	Event System	RO
Storage Devices		Event Subsystem	RO
Storage Device Index	RO	Event Solution	RO
Type	RO	Instance Data Present	RO
Type Description	RO	Event Message	RO
Sub-Identifier	RO	Vendor Specific Data	RO
Media Data Block Size	RO	Event Object	RO
Formatted Media Capacity	RO	CI/O Physical Object State	RO
Removable Device	RO	**Enclosure**	
Device Loaded	RO	Enclosure Index	RO
Removable Media	RO	Type	RO
Media Loaded	RO	Description	RO
Compression	RO	**Bus Port**	
Encryption	RO	Bus Port Index	RO
Storage Controller		Protocol	RO
Controller Index	RO	Protocol Description	RO
Identification	RO	Signal Characteristics	RO
Protection Management	RO	Address Descriptor	RO
Bus Master	RO	Isochronous	RO
Second Since Last Power-Up		Maximum Width	RO
Aggregate Physical Extent		Maximum Transfer Rate	RO
Aggregate Physical Extent Index	RO	Maximum Number of Attachments	RO
Number of Blocks	RO	Connector Type	RO

Table 12.   Adaptec SCSI Instrumentation Available in ISC (continued)

Item	State	Item	State
Number of Blocks of Check data	RO	Connector Type Description	RO
Aggregate Protected Space Extent		Connector Gender	RO
Aggregate Protected Space Extent Index	RO	**Redundancy Group**	
Number of Blocks	RO	Redundancy Group Index	RO
Volume Set		Redundancy Type	RO
Volume Set Index	RO	**Mast Storage Association**	
Name	RO	Association Index	RO
Total Storage Capacity	RO	Type	RO
Protected Space Stripe Length	RO	Reference 1	RO
Protected Space Extent Interleave depth	RO	Reference 2	RO
Bus Port Association		**Worldwide Identifier**	
Bus Port Association Index	RO	Worldwide Identifier Index	RO
Negotiated Speed	RO	Worldwide Identifier Type	RO
Negotiated Width	RO	Worldwide Identifier	RO
Component Spare Association		**Operational State**	
Component Spare Index	RO	Operational State Index	RO
Spare Functioning State	RO	Device Group Index	RO
Mass Storage Statistics		Operational Status	RO
Statistics Index	RO	Usage State	RO
Blocks Read	RO	Availability Status	RO
Blocks Written	RO	Administrative State	RO
Read Commands Issued	RO	Fatal Error Count	RO
Write Commands Issued	RO	Major Error Count	RO
I/O Range 0-12 Read	RO	Warning Error Count	RO
I/O Range 0-12 Written	RO	Current Error Status	RO
Overall Status	RO	Device Predicted Failure Status	RO
Event Log Count		**Event State**	
Event Log Count	RO	Event State Index	RO
Event Log		Event Generation Group Class	RO
Event Log Index	RO	Event Type	RO

Continued

Table 12.   Adaptec SCSI Instrumentation Available in ISC (continued)

Item	State	Item	State
Event Log Entry	RO	Print State	RO
Event Log Timestamp	RO	Associated Group Object	RO
MIFTOMIB			
MIB OID	RO		
Disable Trap	RW		

Symbios SCSI

Table 13 lists the Symbios SCSI instrumentation available in ISC. You can view and configure the Symbios SCSI attributes through the DMI browser interface. Symbios SCSI instrumentation supports event generation.

Table 13.   Symbios SCSI Instrumentation Available in ISC

Item	State	Item	State
Component ID		**Storage Controller**	
Manufacturer	RO	Controller Index	RO
Product	RO	Identification	RO
Version	RO	Worldwide Identifier Type	RO
Serial Number	RO	Worldwide Identifier	RO
Installation	RO	Protection Management	RO
Verify	RO	Bus Master	RO
Software Component Information		Seconds Since Last Power-up	RO
Major Version	RO	FRU Group Index	RO
Minor Version	RO	Operational Group Index	RO
Revision	RO	**Bus Port**	
Build	RO	Bus Port Index	RO
Target Operating System	RO	Protocol	RO
Language Edition	RO	Protocol Description	RO
Identification Code	RO	Signal Characteristics	RO
Installable State	RO	Worldwide Identifier Type	RO
Executable State	RO	Worldwide Identifier	RO
Software Signature		Address Descriptor	RO
File Name	RO	Isochronous	RO
File Size	RO	Maximum Width	RO
File Date and Time	RO	Maximum Transfer Rate	RO
File Checksum	RO	Maximum Number of Attachments	RO

Continued

Table 13.   Symbios SCSI Instrumentation Available in ISC (continued)

Item	State	Item	State
File CRC 1	RO	Connector Type	RO
File CRC 2	RO	Connector Type Description	RO
File Location	RO	Connector Gender	RO
Field Replaceable Unit		Operational Group Index	RO
FRU Index	RO	Mass Storage Statistics Group Index	RO
Device Group Index	RO	**Mass Storage Association**	
Description	RO	Association Index	RO
Manufacturer	RO	Mass Storage Association Type	RO
Model	RO	Object 1 Type	RO
Part Number	RO	Object 1 Index	RO
FRU Serial Number	RO	Object 2 Type	
Revision Level	RO	Object 2 Index	
Warranty Start Date	RO	**Bus Port Association**	
Warranty Duration	RO	Bus Port Association Index	RO
Support Phone Number	RO	Negotiated Speed	RO
Storage Devices		Negotiated Width	RO
Storage Device Index	RO	**Operational State**	
Type	RO	Operational State Instance Index	RO
Type Description	RO	Device Group Index	RO
Worldwide Identifier Type	RO	Operational Status	RO
Worldwide Identifier	RO	Usage State	RO
Sub Identifier	RO	Availability Status	RO
Media Data Block Size	RO	Administrative State	RO
Formatted Media Capacity	RO	Fatal Error Count	RO
Removable Device	RO	Major Error Count	RO
Device Loaded	RO	Warning Error Count	RO
Removable Media	RO	Current Error Status	RO
Media Loaded	RO	Device Predicted Failure Status	RO
Compression	RO	**Sym SDMS Mass Storage System**	
Encryption	RO	Sym Device Index	RO
FRU Group Index	RO	Sym Device Key	RW
Operational Group Index	RO	SMART Reporting Capability	RW

Continued

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Table 13.   Symbios SCSI Instrumentation Available in ISC (continued)

Item	State	Item	State
Storage Devices Events / **Storage Controller Events /** **Bus Port Events /** **Mass Storage Association Events**		SMART Polling Period	RW
Storage Devices Event Type / Storage Controller Event Type / Bus Port Event Type / Mass Storage Association Event Type	RO	**MIFTOMIB**	
Event Severity	RO	MIB Name	RO
Is Event State Based	RO	MIB OID	RO
Event State Key	RO	Disable Traps	RW
Associated Group	RO		
Event System	RO		
Event Subsystem	RO		

AMI RAID

The following table lists the AMI RAID instrumentation available in ISC. You can view and configure the AMI RAID attributes through the DMI browser interface. AMI RAID instrumentation supports event generation.

Table 14.   AMI RAID Instrumentation Available in ISC

Item	State	Item	State
Component ID		**Physical Device Information**	
Manufacturer	RO	Physical Adapter Number	RO
Product	RO	Physical Channel	RO
Version	RO	Target ID	RO
Serial Number	RO	State	RW
Installation	RO	Array Position	RO
Verify	RO	Size (in MB)	RO
Controller Information		Device Type	RO
ADP Adapter Number	RO	Inquiry String	RO
Firmware Version	RO	SCSI Level	RO
BIOS Version	RO	Sync. Negotiation	RO
Num. Logical Drives	RO	QTags	RO
Dram Size (in MB)	RO	Rebuild Progress	RW
Chipset Type	RO	Medium Errors	RO
Rebuild Rate (%)	RO	Other Errors	RO
Flush Interval	RO	All Attributes	RO

Continued

Table 14.   AMI RAID Instrumentation Available in ISC (continued)

Item	State	Item	State
Maximum Concurrent Commands	RO	**Channels**	
Spin Up Delay	RO	Channel Adapter Number	RO
Spin Up Count	RO	Channel	RO
ADP IO Reads (sec)	RO	Terminations	RO
ADP IO Writes (sec)	RO	Channel Status	RO
ADP Reads (KBS/sec)	RO	**Alert Management Information**	
ADP Writes (KBS/sec)	RO	DMI Indication	RW
ADP Read Failures (sec)	RO	AMS^2 Alerts	RW
ADP Write Failures (sec)	RO	Event Log	RW
Scan Channels	RW	**Global Info**	
Logical View	RO	Global Controller Information	RO
Physical View	RO	**Composite Drive Alerts**	
		Physical Drive Alerts	
Logical Drive Information		Event Type	RO
LD Adapter Number	RO	Event Severity	RO
Logical Drive Number	RO	Is Event State Based	RO
RAID Level	RO	Event State Key	RO
Status	RW	Associated Group	RO
Size (in MB)	RO	Event System	RO
Stripe Size	RO	Event Subsystem	RO
Read Policy	RW	Event Solution	RO
Write Policy	RW	Instance Data Present	RO
Cache Policy	RW	Vendor Specific Message	RO
Number Of Spans	RO	Vendor Specific Data	RO
Number Of Stripes	RO	Vendor Trap Number	RO
LD IO Reads (sec)	RO	**MIFTOMIB**	
LD IO Writes (sec)	RO	AMI MegaRAID MIB	RO
LD Reads (KBS/sec)	RO	MIB OID	RO
LD Write (KBS/sec)	RO	Disable Traps	RO
LD IO Read Failures (sec)	RO		
LD IO Write Failures (sec)	RO		
Progress	RW		
All Attributes	RO		

Intel LAN Adapter

Table 15 lists the Intel LAN 82559 Fast Ethernet[†] PCI Bus Controller instrumentation available in ISC. You can view and configure the Intel LAN Adapter attributes through the DMI browser interface.

On NetWare servers, the Intel LAN Adapter instrumentation supports event generation. The MIF information available from the LAN Adapter instrumentation on Windows NT is a subset of the information available from the instrumentation on NetWare. The following table identifies the supported groups and attributes for NetWare and Windows NT.

Table 15.   LAN 82559 Instrumentation Available in ISC

Attribute	NetWare	Windows NT
Component ID		
Manufacturer	RO	RO
Product	RO	RO
Version	RO	Unsupported*
Serial Number	RO	Unsupported*
Installation	RO	RO
Verify	RO	RO
Intel Network Adapter Instrumentation Group		
MIF ID	RO	RO
Version	RO	RO
Intel Network Adapter Driver Extensions Group		
Index	RO	RO
Driver File Path	RO	RO
Driver File Date	RO	RO
Intel Ether-like Group		
Index	RO	RO
Alignment Errors	RO	RO
FCS Errors	RO	RO
Single Collision Frames	RO	RO
Multiple Collision Frames	RO	RO
SQE Test Errors	RO	RO
Deferred Transmissions	RO	RO
Late Collisions	RO	RO
Excessive Collisions	RO	RO
Internal Mac Transmit Errors	RO	RO
Carrier Sense Errors	RO	RO
Frame Too Longs	RO	RO

Continued

Table 15.   LAN 82559 Instrumentation Available in ISC (continued)

Attribute	NetWare	Windows NT
Internal Mac Receive Errors	RO	RO
EtherChipSet	RO	RO
Network Adapter 802 Port Group		
Port Index	RO	RO
Permanent Network Address	RO	RO
Current Network Address	RO	RO
Connector Type	RO	RO
Data Rate	RO	RO
Total Packets Transmitted	RO	RO
Total Bytes Transmitted	RO	RO
Total Packets Received	RO	RO
Total Bytes Received	RO	RO
Total Transmit Errors	RO	RO
Total Receive Errors	RO	RO
Total Host Errors	RO	RO
Total Wire Errors	RO	RO
Network Adapter Driver Group		
Driver Index	RO	RO
Driver Software Name	RO	RO
Driver Software Version	RO	RO
Driver Software Description	RO	RO
Driver Size	RO	RO
Driver Interface Type	RO	RO
Driver Interface Version	RO	RO
Driver Interface Description	RO	RO
MIFTOMIB		
MIB Name	RO	RO
MIB OID	RO	RO
Disable Trap	RW	RW

*   "Unsupported" attributes are specified in the standard LAN MIF groups but are not supported in the Intel LAN MIF.

Mylex RAID

The following table lists the Mylex RAID instrumentation available in ISC. The Mylex RAID instrumentation is supported only on servers running 2.8 versions of LDSM. You can view and configure the Mylex RAID attributes through the DMI browser interface.

Mylex RAID instrumentation supports event generation.

Table 16.   Mylex RAID Instrumentation Available in ISC

Item	State	Item	State
Component ID		**Physical Device Information**	
Manufacturer	RO	Controller Number	RO
Product	RO	SCSI Bus ID	RO
Version	RO	SCSI Target ID	RO
Serial Number	RO	Operational State	RO
Installation	RO	Vendor ID	RO
Verify	RO	Product ID	RO
Controller Information		Product Revision Level	RO
Controller Number	RO	Size (in MB)	RO
Operational State	RO	Device Type	RO
Firmware Revision	RO	Soft Errors Count	RO
Configured Channels	RO	Hard Errors Count	RO
Actual Channels	RO	Parity Errors Count	RO
Maximum Logical Drives	RO	Misc Errors Count	RO
Maximum Targets Per Channel	RO	**Logical Drive Statistics**	
Maximum Tagged Requests	RO	Controller Number	RO
Max. Data Transfer Size Per I/O Req.	RO	Logical Drive Number	RO
Maximum Concurrent Commands	RO	Read Requests Count	RO
Rebuild Rate	RO	Amount of Data Read (in MB)	RO
Logical Sector Size (in Bytes)	RO	Write Requests Count	RO
Physical Sector Size (in Bytes)	RO	Amount of Data Written (in MB)	RO
Cache Line Size (in Bytes)	RO	Read Cache Hit (%)	RO
DRAM Size (in MB)	RO	**Physical Drive Statistics**	
EPROM Size (in KB)	RO	Controller Number	RO
Bus Type	RO	SCSI Bus ID	RO
System Bus Number	RO	SCSI Target ID	RO
Slot Number	RO	Read Requests Count	RO
Interrupt Vector Number	RO	Amount of Data Read (in KB)	RO
Interrupt Mode	RO	Write Requests Count	RO

Continued

Table 16.   Mylex RAID Instrumentation Available in ISC (continued)

Item	State	Item	State
Logical Drive Information		Amount of Data Written (in KB)	RO
Controller Number	RO	**Error Control Group**	
Logical Drive Number	RO	SelfID	RO
Operational State	RO	Fatal Errors Count	RO
RAID Level	RO	Major Errors Count	RO
Write Policy	RO	Warning Errors Count	RO
Size (in MB)	RO	Error Status	RO
Stripe Size (in Bytes)	RO	Error Status Type	RO
Physical Drive Map	RO	Alarm Generation	RW
Mylex DAC960 Component Inst. Info.		**MIFTOMIB**	
CI Revision	RO	MDAC MIB	RO
CI Build Date	RO	MIB OID	RO
MDAC Device Driver Revision	RO	Disable Trap	RW
MDAC Device Driver Build Date	RO		

APC UPS

The following table lists the APC UPS instrumentation available in ISC. The APC UPS instrumentation is supported only on servers running 2.8 versions of LDSM. You can view and configure the APC UPS attributes through the DMI browser interface.

APC UPS instrumentation supports event generation.

Table 17.   APC UPS Instrumentation Available in ISC

Item	State	Item	State
Component ID		**Operational State**	
Manufacturer	RO	Operational State Instance Index	RO
Product	RO	Device Group Index	RO
Version	RO	Operational Status	RO
Serial Number	RO	Usage State	RO
Installation	RO	Availability Status	RO
Verify	RO	Administrative State	RO
UPS Battery		Fatal Error Count	RO
Battery Status	RO	Major Error Count	RO
Seconds On Battery	RO	Warning Error Count	RO
Estimated Minutes Remaining	RO	Current Error Status	RO
Estimated Charge Remaining	RO	Operational State Table	RO
Battery Voltage	RO	**Diagnostic Function Group**	

Continued

Table 17.   APC UPS Instrumentation Available in ISC (continued)

Item	State	Item	State
Battery Current	RO	Diagnostic Function Table Index	RO
Temperature Probe Index	RO	Diagnostic Function Name	RO
FRU Group Index	RO	Diagnostic Function Description	RO
Operational Group Index	RO	Exclusive Access Required	RO
Temperature Probe		Prerequisite Conditions	RO
Temperature Probe Table Index	RO	Prerequisite Diagnostic Function	RO
Temperature Probe Location	RO	**Diagnostic Request Group**	
Temperature Probe Description	RO	Diagnostic Function Reserve Key	RW
Temperature Status	RO	Diagnostic Function Request	RW
Temperature Probe Temp. Reading	RO	Diagnostic Function Result	RO
Monitored Temp. Nominal Reading	RO	**Diagnostic Results Group**	
Monitored Temp. Normal Maximum	RO	Diagnostic Function ID	RO
Temperature Probe Maximum	RO	Diagnostic Function Result	RO
Temperature Probe Minimum	RO	Diagnostic Function Result Desc.	RO
Temp. Reading Lower Threshold Noncritical	RW	Fault Isolated to this Component	RO
Temperature Reading Upper Threshold Noncritical	RW	**Error Control**	
Temperature Reading Lower Threshold Critical	RW	Self ID	RO
Temperature Reading Upper Threshold Critical	RW	Number of Fatal Errors	RO
Temperature Reading Lower Threshold Nonrecoverable	RW	Number of Major Errors	RO
Temperature Reading Upper Threshold Nonrecoverable	RW	Number of Warnings	RO
Temperature Probe Resolution	RW	Error Status	RO
Temperature Probe Tolerance	RW	Error Status Type	RO
Temperature Probe Accuracy	RW	Alarm Generation	RW
FRU Group Index	RO	**MIFTOMIB**	
Operational Group Index	RO	MIB Name	RO
		MIB OID	RO
		Disable Trap	RW

10 DMI to SNMP Translator

You can use the DMI-SNMP Translator to integrate DMI management with SNMP. The translator attaches directly to the Network OS's SNMP agent and to the DMI Service Layer by registering as a management application. The translator translates management requests from SNMP to DMI and responses from DMI to SNMP. DMI events (indications generated by the component instrumentation when a threshold is crossed or a sensor changes state) are translated into enterprise-specific SNMP traps.

The translator translates these MIFs:

- Baseboard
- ICMB
- Local Response Agent
- Adaptec SCSI
- Symbios SCSI
- AMI RAID
- Intel LAN Adapter

The translator raises a trap when a DMI indication is received. The DMI-SNMP Translator does not support configured actions. This alerting mechanism works independently of the Local Response Agent.

For the DMI-SNMP Translator to work correctly, the SNMP Agent on the managed server OS must be configured correctly. For example, the Windows NT, NetWare, or UnixWare SNMP Agents need some configuration to enable the server to send SNMP traps to specific SNMP management consoles. To configure the SNMP Agent on the server, see the documentation supplied by the OS vendor.

To manage the DMI information supplied by ISC software through the SNMP management workstation, the following MIBs must be compiled on the SNMP console:

- ADAPTEC.MIB
- BASEBRD.MIB
- BASEBRD2.MIB
- BASEBRD3.MIB
- ICMBFEAT.MIB
- RMTCHAS.MIB
- E100B.MIB
- LRA.MIB
- MEGARAID.MIB
- SYMSDMS.MIB
- INTELNIC.MIB
- CIO.MIB

These MIB files are installed during the ISC Console and ISC Server installation. The files are copied to the %ISC_PATH%\SNMPMIBS directory during installation. ISC_PATH is the installation directory chosen during install.

The procedures for compiling these MIBs depend on the SNMP console being used. For more information, see the documentation supplied with your SNMP console software.

11 ISC Event Messages

ISC allows you to configure event actions to be taken on the managed server when an event occurs. These actions include audio/visual notifications, such as:

- Display an alert message
- Write a message to the LCD
- Broadcast a message

The message text is based on the event information. This text contains the DMI MIF group and attribute information that caused the error.

Alert Messages on the Server Console

The following table lists the alert messages that display on the server console. The general format of these messages is:

Event reported for `<attribute_name>` attribute in the `<group_name>` group.

Table 18.   Server Console Alert Messages

Alert Message	Description
Event reported for Upper Critical Threshold attribute in the Temperature Sensor group.	A temperature sensor on the system reported that the current value is above the upper critical range.
Event reported for Upper Noncritical Threshold attribute in the Temperature Sensor group.	A temperature sensor on the system reported that the current value is above the upper noncritical range but below the upper critical range. This message is also generated when the temperature returns to the acceptable range.
Event reported for Lower Noncritical Threshold attribute in the Temperature Sensor group.	A temperature sensor on the system reported that the current value is below the lower noncritical range but above the lower critical range. This message is also generated when the temperature returns to the acceptable range.
Event reported for Lower Critical Threshold attribute in the Temperature Sensor group.	A temperature sensor on the system reported that the current value is below the lower critical range.
Event reported for Upper Critical Threshold attribute in the Voltage Sensor group.	A voltage sensor on the system reported that the current value is above the upper critical range.
Event reported for Upper Noncritical Threshold attribute in the Voltage Sensor group.	A voltage sensor on the system reported that the current value is above the upper noncritical range but below the upper critical range. This message is also generated when the voltage returns to the acceptable range.

Continued

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Table 18.   Server Console Alert Messages (continued)

Alert Message	Description
Event reported for Lower Noncritical Threshold attribute in the Voltage Sensor group.	A voltage sensor on the system reported that the current value is below the lower noncritical range but above the lower critical range. This message is also generated when the voltage returns to the acceptable range.
Event reported for Lower Critical Threshold attribute in the Voltage Sensor group.	A voltage sensor on the system reported that the current value is below the lower critical range.
Event reported for Current Status attribute in the Security Sensor group.	System chassis front panel or side panel has been opened (or it was open and has been closed).
Event reported for Current Status attribute in the Cooling Fan group.	System fan has stopped (or restarted).
Event reported for Array Error Type attribute in the Memory Array group.	A memory error has been reported on the system.
Event reported for Event Status attribute in the Logical Unit group.	A SCSI device reported a state change.
Event reported for Event Status attribute in the Host Adapter group.	A SCSI board reported a state change.
Event reported for Operational State attribute in the Controller Information group.	A RAID controller reported a state change.
Event reported for Operational State attribute in the Physical Drive Information group.	A RAID drive reported a state change.
Event reported for Processor Status attribute in the Processor group.	A processor sensor on the system reported a processor error.
Event reported for Power Unit Redundancy Status attribute in the Power Unit Global Table group.	The power supply redundancy sensor on the system reported a power supply redundancy state change.
Event reported for Total Transmit Errors Threshold attribute in the Indication Control group.	The LAN Adapter reported that the number of transmit errors is above the threshold value.
Event reported for Total Receive Errors Threshold attribute in the Indication Control group.	The LAN Adapter reported that the number of receive errors is above the threshold value.
Event reported for Total Host Errors Threshold attribute in the Indication Control group.	The LAN Adapter reported that the number of host errors is above the threshold value.
Event reported for Total Wire Errors Threshold attribute in the Indication Control group.	The LAN Adapter reported that the number of wire errors is above the threshold value.
Event "Status Changed to OK" reported in the Voltage Probe group.	A Voltage probe changed its status to an OK state.
Event "Status Changed to Lower Critical" reported in the Voltage Probe group.	A Voltage probe changed its status to Lower Critical state.
Event "Status Changed to Upper Critical" reported in the Voltage Probe group.	A Voltage probe changed its status to Upper Critical state.
Event "Status Changed from OK to Lower Noncritical" reported in the Voltage Probe group.	A Voltage probe changed its status from normal to Lower Noncritical state.

Continued

Table 18. Server Console Alert Messages (continued)

Event "Status Changed from OK to Upper Noncritical" reported in the Voltage Probe group.	A Voltage probe changed its status from normal to Upper Noncritical state.
Event "Status Changed from Lower Critical to Lower Noncritical" reported in the Voltage Probe group.	A Voltage probe changed its status from Lower Critical to Lower Noncritical state.
Event "Status Changed from Upper Critical to Upper Noncritical" reported in the Voltage Probe group.	A Voltage probe changed its status from Upper Critical to Upper Noncritical state.
Event "Status Changed to OK" reported in the Temperature Probe group.	A Temperature probe changed its status to an OK state.
Event "Status Changed to Lower Critical" reported in the Temperature Probe group.	A Temperature probe changed its status to Lower Critical state.
Event "Status Changed to Upper Critical" reported in the Temperature Probe group.	A Temperature probe changed its status to Upper Critical state.
Event "Status Changed from OK to Lower Noncritical" reported in the Temperature Probe group.	A Temperature probe changed its status from normal to Lower Noncritical state.
Event "Status Changed from OK to Upper Noncritical" reported in the Temperature Probe group.	A Temperature probe changed its status from normal to Upper Noncritical state.
Event "Status Changed from Lower Critical to Lower Noncritical" reported in the Temperature Probe group.	A Temperature probe changed its status from Lower Critical to Lower Noncritical state.
Event "Status Changed from Upper Critical to Upper Noncritical" reported in the Temperature Probe group.	A Temperature probe changed its status from Upper Critical to Upper Noncritical state.
Event "Internal Error" reported in the Processor group.	A system processor reported an internal error.
Event "Thermal Trip Error" reported in the Processor group.	A system processor reported a Thermal Trip error.
Event "FRB Error" reported in the Processor group.	A system processor reported an error during the FRB (Fault Resilient Boot) sequence.
Event "Redundancy Lost" reported in the Power Unit Global Table group.	A power unit on the system lost the redundancy state.
Event "Redundancy Regained" reported in the Power Unit Global Table group.	A power unit on the system regained the redundancy state.
Event reported on the Storage Device Event Type attribute in the Storage Device Events group.	A predictive failure noncritical on a SCSI device.
Event reported on the Storage Controller Event Type attribute in the Storage Controller Events group.	A SCSI controller reported a state change.
Event reported for Event Type attribute in the Physical Drive Alerts group.	A RAID device reported a state change.

Broadcast and LCD messages

The following table lists broadcast and LCD messages.

Broadcast messages are sent across the network to client computers. The general format of broadcast messages is:

```
Check <group_name> at server <server_name>
```

LCD messages are displayed on the managed server's LCD. These are limited to 32 characters; longer messages are truncated. The general format of LCD messages is:

```
Check:  <group_name>
```

Table 19.   Broadcast and LCD Messages

Message	Description
Check: Temperature Sensor. Check: Temperature Probe.	A temperature sensor reported a change in state (OK/Noncritical/Critical).
Check: Voltage Sensor. Check: Voltage Probe.	A voltage sensor reported a change in state (OK/Noncritical/Critical).
Check: Security Sensor. Check: Physical Container Global Table.	System chassis front panel or side panel has been opened (or it was open and has been closed).
Check: Cooling Fan.	System fan has stopped (or restarted).
Check: Memory Array.	A memory error has been reported on the system.
Check: Host Adapter.	A SCSI board reported a state change.
Check: Logical Unit.	A SCSI device reported a state change.
Check: Controller Information.	A RAID controller reported a state change.
Check: Physical Drive Information.	A RAID drive reported a state change.
Check: Processor.	A processor error has been reported on the system.
Check: Power Unit Global Table.	A power unit redundancy state change has been reported on the system.
Check: Power Supply.	A power supply failed on the system.
Check: Indication Control Group.	The LAN Adapter reported a threshold crossing.
Check: Storage Device Events.	A SCSI device reported a state change.
Check: Storage Controller Events.	A SCSI controller reported a state change.
Check: Physical Drive Alerts.	A RAID drive reported a state change.

12 ISC Sensor Thresholds

The following table lists default values for voltage and temperature sensor thresholds for the AP450GX MP motherboard. ISC maintains these values.

For the remaining supported motherboards, default threshold values are stored in Sensor Data Records (SDR) in nonvolatile storage on the motherboard. These values are determined and configured during motherboard manufacturing and are therefore not documented in this manual.

Table 20.   AP450GX MP Motherboard Thresholds

	Lower Critical	Lower Noncritical	Upper Noncritical	Upper Critical
Voltage Sensor (value in V)				
12V	09.96	10.44	13.56	14.04
5V	04.4	04.6	05.4	05.6
3V	02.9	03.04	03.56	03.7
Temperature Sensors (value in °C)				
CPU	10.36	0.56	44.52	54.32
I/O Slot Area	10.36	0.56	44.52	54.32

A Using the Intel Server Control Console

Introduction

The Intel Server Control Console is a lightweight management console that provides basic server management functions. It allows you to run ISC, DMI Explorer browser, or other server management tools without using an Enterprise Management Console (such as LANDesk Server Manager). It also allows you to run the Emergency Management Port console application on servers that have EMP capability.

The ISC Console provides you with the ability to:

• Discover Intel servers

• Discover management tools on those servers

• Launch the management tools on the managed servers

The ISC Console runs in one of three ways:

• As an executable program

• Under Microsoft Management Console

• As an ActiveX Control under Netscape Navigator or Internet Explorer

Scope

This appendix describes the user interface and controls of the ISC Console.

See Chapter 3 for information about installing the ISC Console.

See Chapter 4 for information about launching the ISC Console.

Intel Server Control Console Main Screen

Figure 2 shows the Intel Server Control Console, running with Internet Explorer.
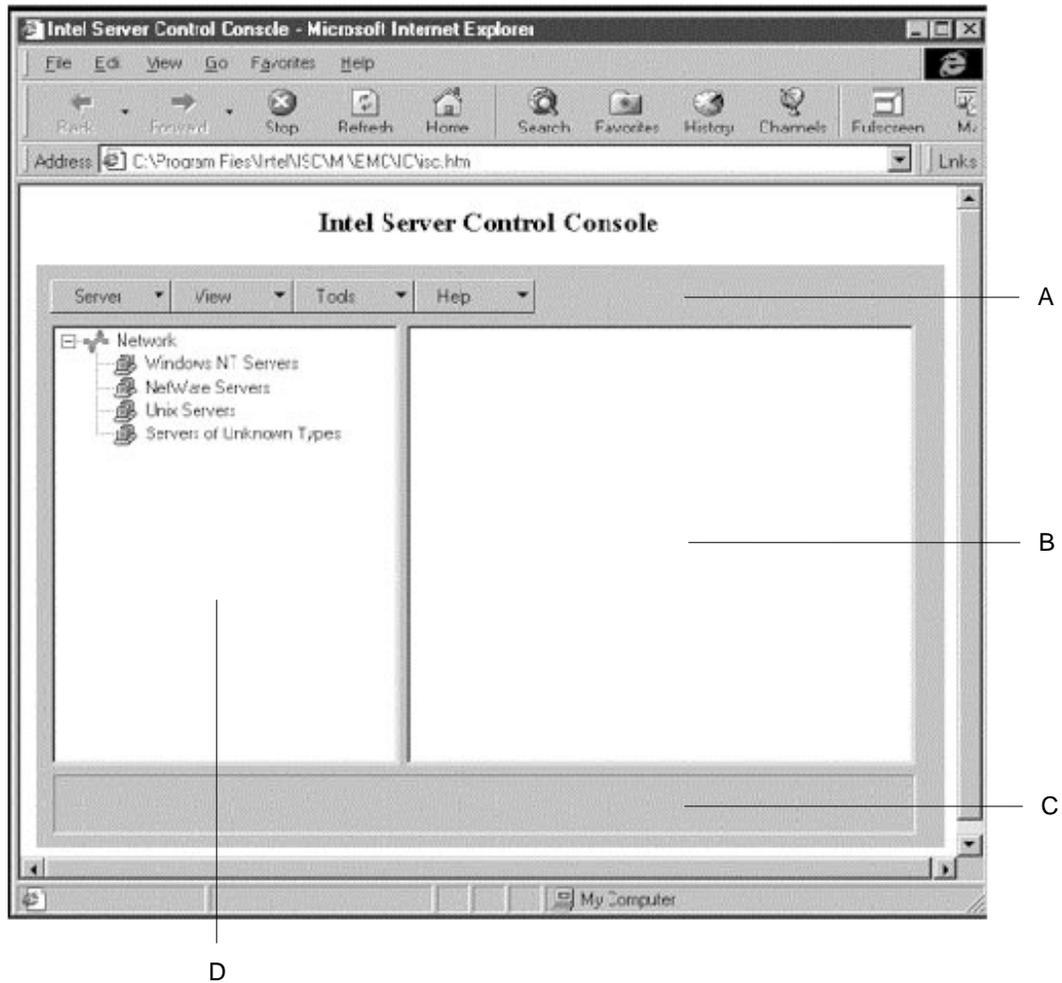
Figure 2. ISC Console Main Screen

A   Button bar
B   Tool Pane (page 82)
C   Status Bar (page 82)
D   Navigation Pane (page 82)

ISC Console Button Bar

The ISC Console uses a Windows Explorer-like model, with a navigation pane (tree view) and a presentation pane (list view). Servers that are discovered are added to the tree view. When you select a server from the tree, the presentation pane shows a list of supported "tools" running on that

server. You launch the supported tool from the presentation pane by double-clicking on the tool icon.

The Button Bar includes the following options:

Table 21.   Button Bar Items

Item	Options
Server Menu	**Discover:** Start server discovery
	Stop Discovery: Cancel currently running discovery process
	Add: Manually add a server to the tree
	Delete: Delete the selected server from the tree
	Delete All: Delete all servers from the tree
View Menu	**Large Icons:** View the tool list with large icons
	Small Icons: View the tool list with small icons
	Options: Configure server/tool views
Tools Menu	**Launch Selected Tool:** Start the selected tool for the selected server
	Launch EMP: Start the Emergency Management Port Console Manager
Help Menu	**Help Topics:** Accesses ISC Console help topics
	About ISC Console: Displays ISC Console version information

Server Menu Options

Discover

You can discover multiple servers in a single step and add them to the server tree. Servers are discovered using a Ping Sweep mechanism supported on servers running TCP/IP.

To discover a range of servers with IP addresses, do the following steps:

1. On the Button Bar, click the Server->Discover menu selection.
2. Enter the starting address and ending address to be discovered. The starting address will default to the network subnet of the console machine starting at address 0. The ending range will default to the value 255, indicating that ISC will search the entire network subnet. If you change the default address value, enter the full IP address. Wild card characters are not allowed. For all IP addresses, the range of values allowed for any IP address segment is between 0 and 255.
3. Click <OK>.

The ISC Console will ping each server and test each server for all ISC-registered tools. If one or more of the tools is found, then the server will be added to the server tree. The server will appear under the appropriate OS-specific branch of the server tree, depending on which OS is running on the server. If the OS on the server cannot be determined, the server will be added under the Servers of Unknown Type branch.

During the discovery process, the status bar indicates ping status, those servers found, and those servers not responding.

Information on servers discovered through ISC is maintained across machine boots. When the ISC Console is run, servers discovered during previous sessions are displayed. You do not have to run discovery every time the ISC Console is launched.

If any of the tools supported by the ISC Console are installed or removed from any managed server, the ISC Console discovery process will need to be rerun on that server to update the tool list for that server.

Stop Discover

This selection ends the discovery process.

Add

You can manually add a server with an IP or IPX address to the ISC Console server tree.

To add a server with an IP or IPX address, do the following steps:
1. On the Button Bar, click the Server->Add menu selection.
2. Choose a radio button for either the IP label or the IPX/SPX label. The default is "IP address."
3. Enter the full address of the desired server. Wild card characters are not allowed. For all IP addresses, the range of values allowed for any IP address segment is between 0 and 255. For an IPX/SPX address, you must specify all 20 (8 and 12) characters that make up the Net and Node portions of an IPX/SPX address.
4. Click <OK>.

The ISC Console will test the specified server for all ISC-registered tools. If one or more of the tools is found, then the server will be added to the server tree. The server will appear under the appropriate OS-specific branch of the server tree, depending on which OS is running on the server. If the OS on the server cannot be determined, the server will be added under the Servers of Unknown Type branch.

Delete/Delete All

You can manually delete a server from the ISC Console server tree.

To delete a server, do the following steps:
1. Select a server or multiple servers from either the Windows NT Servers, NetWare Servers, UnixWare Servers, or Servers of Unknown Type branch in the server tree.
2. On the Button Bar, click the Server->Delete or Server->Delete All menu selection.
3. A confirmation dialog will be displayed. Click <OK>.

ISC will delete the server(s) from the server tree. To restore information about that server, you must rediscover the server using Server->Add or Server->Discover.

View Menu Options

Large Icons/Small Icons

Changes the size of the icons in the Tool Pane.

Options

The server tree view may be configured to display tool information in many configurations. You can show all the servers discovered, regardless of what tools are supported. You can display the set of servers that only support a single tool, or the set of servers supporting a combination of tools.

To view all tools on all discovered servers, do the following steps:
1. On the Button Bar, click the View->Options menu selection.
2. Click the radio button next to View All Tools.
3. Click <OK>.

To configure the server view for specific tools, do the following steps:
1. On the Button Bar, click the View->Options menu selection.
2. Click the radio button next to View Selected Tools Only.
3. Check the boxes in the tool list for the tools to be selected for display.
4. Click <OK>.

If View All Tools is selected, the ISC Console will display all discovered servers where one or more of the supported tools is found.

If View Selected Tools Only is selected, the ISC Console will only display those discovered servers that have the specified supported tools.

Tools Menu Options

Launch Selected Tool

Once you have discovered a server and the tools supported on that server, you can start the tool from the ISC Console.

To start a tool by using the menu options, do the following steps:
1. Select a server from either the Windows NT Servers, NetWare Servers, UnixWare Servers, or Servers of Unknown Type branch in the server tree.
2. Select the desired tool from the list view on the main dialog for the specified server.
3. On the Button Bar, click the Tools->Launch Selected Tool menu selection.

To start a tool from the Tool Pane, do the following steps:
1. Select a server from either the Windows NT Servers, NetWare Servers, UnixWare Servers or Servers of Unknown Type branch in the server tree.
2. Double-click on the desired tool in the Tool Pane.

Launch EMP

The Emergency Management Port (EMP) Console Manager is a supported tool in the ISC Console, but is not discovered on the server. EMP is a out-of-band management application that requires modem support on the console and the managed server, or a direct connection between the console and the managed server.

The following server control operations are available with the EMP Console Manager:

- Connecting to remote servers
- Powering the server on or off
- Resetting the server
- Switching the server console between EMP active and BIOS re-direct modes

The ISC Console provides a launch point for the EMP application through the menu options, but EMP will not appear as a supported tool under a selected server.

To start the Emergency Management Port Console Manager:

1. On the Button Bar, click the ToolsLaunch->EMP menu selection.

See the Release Notes for a list of baseboards that provide EMP support.

See the Product Guide for the managed server for information about using the EMP Console Manager.

Help Menu Options

Help Topics

Displays the online help dialog for the ISC Console.

About ISC Console Help

Displays the version number of the ISC Console.

Navigation Pane

The Navigation pane shows a tree view of servers with management tools that have been discovered. Servers are organized based on the operating system running on the server. ISC has tree branches for Windows NT Servers, NetWare Servers, UnixWare Servers, and a branch for servers where ISC could not determine the operating system type called Servers of Unknown Type. These branches have expansion icons ("+" or "-") appearing to the left of them. These branches can be expanded to list managed servers or collapsed to hide managed servers.

Tool Pane

When you select a server in the navigation pane, the tool pane displays a set of icons representing the management tools supported on that server. You can start the management tool for the managed server by double-clicking on the tool icon in the tool pane.

Status Bar

The status bar displays information about ISC Console operations, such as the number of servers found with valid addresses and number of servers not responding during a Discover.