Intel® Server Control
User's Guide

Version 3.5.2

Legal Information

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About Intel® Server Control Software

✏ **NOTE**

> This section describes the Intel® Server Control (ISC) server-management package. See page 16, Using the Intel Server Control Console for information about using the ISC Console.

Introducing Intel Server Control

Intel Server Control (ISC) software is a package that provides tools to manage remote servers. The components of ISC are described in the following paragraphs.

Intel Server Control Components

The following components are part of Intel Server Control:

Intel Server Control Console: The ISC Console is a management console that provides basic server management functions. It allows you to run Platform Instrumentation Control (PIC), Direct Platform Control (DPC), DMI Explorer, and Client System Setup Utility (CSSU). The ISC Console provides you with the ability to discover servers with ISC management tools.

The ISC Console is automatically installed whenever any of the other ISC components is installed.

See page 16, Using the Intel Server Control Console for information about the Console interface.

Platform Instrumentation Control (PIC): PIC provides real-time monitoring and alerting for server hardware sensors. PIC communicates via a LAN connection to the Platform Instrumentation (PI) software on the Server, using standard DMI/RPC protocols.

See page 7, Platform Instrumentation Control for summary information, or click the Help button in the PIC Console for detailed information.

Direct Platform Control (DPC): DPC is a server management tool that gives you access to a remote server when it is online or offline, when the operating system is hung, or when it's powered off. When you receive notice that a server has malfunctioned (via a page, for example), you can use DPC to investigate the cause of the alert, to initiate corrective action, and to restart the server into normal operation.

DPC communicates either with the Emergency Management Port (EMP) or the Total Cost of Ownership (TCO) port on the server. EMP access is a serial link, either via modem or a direct serial connection. The TCO port provides LAN access.

Client System Setup Utility (CSSU): CSSU allows you to run the System Setup Utility (SSU) for a managed server from a remote location. It communicates via a channel opened by DPC.

See page 9, Client System Setup Utility for summary information, or click the Help button in the Client SSU for detailed information.

DMI Explorer: DMI Explorer shows attribute values for each DMI-compliant component, and manages third-party DMI-compliant components. ISC installs the DMI Explorer browser in the ISC Console.

See page 10, DMI Explorer for summary information.

LAN-Alert Viewer and Manager: The LAN-Alert Manager sends and receives alerts over a LAN connection as opposed to pages that are sent over a serial connection. The manager running on a server executes as a service and sends out alerts packaged as SNMP traps using a UDP/IP protocol. The manager running on a client decodes LAN alerts received from a managed server. The LAN-Alert Viewer is the user interface running on a client that lets you monitor these types of alerts.

LAN-Alert is a Java-based component that can run on Windows NT[†] or Windows[†] 2000 systems. Refer to the help system that is part of LAN-Alert for more information.

Finding the Right Tool

This table is a summary that will help you find the right tool to use for any server condition. Read the tool descriptions that follow the table for more information.

Managed Server Status	Potential Remote Tasks	Access	Tools Available
The operating system is running and the server is online. Applications are running.	Update Sensors Receive Alerts Shutdown	LAN	Platform Instrumentation Control (PIC)
Operating System is running but the server is offline or otherwise malfunctioning.	Inspect Remedy Restart	LAN/ Local/ Modem	Direct Platform Control (DPC)
The server runs its BIOS and Power-On Self-Test successfully.	Redirect Console Boot Service Partition	LAN/ Modem	Direct Platform Control (DPC) Client System Setup Utility (CSSU)
The server is off, hung, or won't boot. (Standby power enabled)	View history Update F/W or BIOS Examine state Restart	LAN/ Modem	Direct Platform Control (DPC) Client System Setup Utility (CSSU)

Managing Remote Servers

Server Management Basics

The Intel Server Control components provide a means to communicate with a managed server, and to perform administrative tasks and troubleshooting from a remote client.

The next table shows the typical tasks that a system administrator might do. They include normal system administration, setting up system alerts so that an administrator is notified when something on the server needs attention, and acting in response to alerts or errors.

Administer	• Monitoring system status • Tracking system history • Managing system assets
Alert	• Configure sensor thresholds • Configure alert actions • Respond to alerts received from the managed server • Configure Predictive Failure Notification
Act	• Restoration • Diagnosis • Updating the system • Configuration • Repair

The tools used for the various server management tasks are described below, under **Server Management Tools**. See page 12 for a description of the available system management consoles. The different methods for communicating with a managed server are described on page 13, Connecting to a Remote Server.

Server Management Tools

There are several tools available for server management, each for a different purpose or for use in a different condition. Tools are sometimes used together, or in sequence, to perform server management tasks.

The available tools for remote server management, described in the following paragraphs, include:

Platform Instrumentation Control
Direct Platform Control
Client System Setup Utility
The Service Partition
DMI Explorer
LAN Alert Viewer

Platform Instrumentation Control

Platform Instrumentation Control (PIC) connects to servers running Microsoft Windows NT[†], Windows[†] 2000, NetWare[†], Red Hat[†] Linux[†], or UnixWare[†], and provides real-time monitoring and alerting for server hardware sensors. PIC communicates via a LAN connection to the Platform Instrumentation (PI) on the server, using standard DMI/RPC protocols.

ISC installs Platform Instrumentation on the managed server and console software on a client workstation. 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 Platform Instrumentation on multiple servers and Console software on multiple clients.

PIC integrates into the enterprise and workgroup management consoles, as well as into the Intel Server Control Console. PIC relies on the management console to discover servers over the LAN. It also forwards changes in the server state to the management consoles for appropriate alert handling.

What is Platform Instrumentation?

Platform Instrumentation consists of the server-resident software used to monitor and control the server when the operating system is online. The instrumentation retrieves data from the operating system as well as from the Platform Management Technology (hardware, firmware and BIOS), and communicates with management tools using Desktop Management Interface 2.0 (DMI 2.0).

Platform Instrumentation also provides instrumentation data for the servers connected through the Intelligent Chassis Management Bus (ICMB). This allows PIC to use the Platform Instrumentation on one server to access the Platform Management Technology on another server/chassis. This is useful when the target server is not fully operational (such as when the OS is down) and cannot be reached directly by the PIC, or when the target server is running an OS that is not supported by the Platform Instrumentation.

Any change in the server state generates a DMI indication. A Local Response Agent responds by taking actions such as:

- Powering off the server
- Resetting the server
- Generating an NMI
- Beeping the system speaker
- Logging to a disk
- Broadcasting a message on the network
- Displaying a message on the system console
- Paging the administrator.

You can use Platform Instrumentation Control to:

- View consolidated server health information
- Manage non-Intel-based systems via the Intelligent Chassis Management Bus (ICMB)
- 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
- View system event log, system hardware inventory, BIOS and system slot information. If the server has a SCSI controller and/or LAN adapter, you can also view their status.

You can use PIC to track system status and manage hardware conditions, such as:

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

Direct Platform Control

Direct Platform Control (DPC) is a server management tool that gives access to a remote server when it is online or offline, when the operating system is hung, or when it's powered off. When you receive notice that a server has malfunctioned (via a page, for example), you can use DPC to investigate the cause of the alert, to initiate corrective action, and to restart the server into normal operation.

DPC communicates either with the Emergency Management Port (EMP) or the Total Cost of Ownership (TCO) port on the server. EMP provides serial communication, via modem or a direct serial connection. TCO provides LAN access.

DPC uses a redirected text-based console. Since DPC does not communicate with the server operating system, it can be used to manage the server even if the server's operating system and primary processors are not working. Because the server's emergency management hardware works on 5V standby power, DPC can be used to communicate with and control a powered-down server.

DPC integrates into a variety of management consoles, as well as the ISC Console. DPC relies on the management console or ISC Console to discover servers over the LAN.

Using DPC, you can

- Reboot a server
- Restart a server that's powered off
- View the System Event Log (SEL) for information about recent server activity
- View Sensor Data Records (SDRs) for information about sensor characteristics
- Review Field Replaceable Unit (FRU) inventories
- View current Remote Sensor Access (RSA) information

Client System Setup Utility

Use the Client SSU when you need to:

- View and modify the assignment of resources (ports, memory, IRQ's, DMA)
- Modify the server's boot device order or security settings
- Change the server configuration settings
- Save the server configuration
- View or clear the System Event Log (SEL)
- View Field Replaceable Unit (FRU) information
- View the Sensor Data Record (SDR) table

To specify a system configuration, SSU uses the information provided by:

- The baseboard CFG file
- Configuration registers

The Client SSU stores configuration values in flash memory. These values take effect when you boot the server.

Start a Client SSU session by requesting a service boot through the Emergency Management Port. As the service environment boots, a network stack and agent are started and communication switches to the required protocol.

The Client SSU integrates into the ISC Console and enterprise system management consoles.

What is the Service Partition?

The Client System Setup Utility (CSSU) relies on the server's Service Partition. The Service Partition is installed on a separate file system partition, and includes the ROM-DOS operating system and System Setup Utility (SSU). CSSU provides a standard communication stack that can be used over a modem, serial port, or LAN to provide remote control of the SSU or any other compatible utility.

The Service Partition may also be used with a redirected text-based console.

Once the utilities and the tests are completed on the Service Partition, the system can be rebooted. The BIOS reverts back to normal boot order after the reboot.

DMI Explorer

You can use DMI Explorer to view attribute values for each DMI-compliant component, and to manage third-party DMI-compliant components.

The DMI Explorer can be installed as a tool available from the ISC Console. Select "Install DMI Explorer" when you are installing the ISC software.

LAN-Alert Manager and Viewer

The LAN-Alert feature enables a server to proactively alert administrators of critical system failures and state changes regardless of the state of the server's operating system or the server's management software.

LAN-Alert Manager

The LAN-Alert Manager, when executing on a server, interfaces with the Baseboard Management Controller (BMC) to create SNMP traps and send them out over the LAN using a UDP/IP protocol. When the manager executes on a client that is monitoring servers, the manager senses and decodes these traps for viewing by the LAN-Alert Viewer.

With the LAN-Alert feature you can detect and sense the following:

- Temperature Sensor out of range
- Voltage Sensor out of range
- Chassis Intrusion (Security Violation)
- Power Supply Fault
- BIOS: Uncorrectable ECC error
- BIOS: POST Error Code
- Boot Failures
- Fatal MCA
- Watchdog Timer reset, power down, or power cycle
- System restart (reboot)
- Fan failures

The server's BIOS setup lets you configure the following:

- The trap destination as a specific IP address or an address of a specific IP subnet.
- The Host IP Configuration data such as the IP address, default gateway, and subnet mask
- The Platform GUID
- Alert event filters.

LAN-Alert Viewer

The LAN-Alert Viewer is a Java-based console that provides the capability to manage LAN Alerts.

In order for the LAN-Alert Viewer to receive alerts, the Windows SNMP service needs to be installed. Following are the instructions on how to install the service on both Windows NT and 2000.

Windows NT

1. Open the Control panel and select the network applet.

2. Select the **Services** tab and click on the **Add** button.

3. Select the **SNMP Service** and click on the **Ok** button.

Windows 2000

1. Open the Control panel and select the **Add/Remove Programs** applet.

2. Click on the **Add/Remove Windows Components** icon.

3. Click the **Management and Monitoring Tools** check box and then the **Next** button.

The viewer presents information regarding:

- Server IP
- Sensor Info
- Event Info
- Sensor Device
- Sensor Number
- Event Severity

The Alert Viewer supports the following actions:

- Configure—Allows you to configure different notification and viewer options.
- Acknowledge—Sets the selected alerts' "status" to Acknowledge. This means you have seen and are aware of the alert.
- Delete—Removes the selected alert from the list of alerts.
- Close—Closes the viewer.
- Select All—Selects all alerts, for performing actions on all alerts.
- View Details—Launches the detailed view of the selected alert(s).

For information on how to use the LAN-Alert feature, refer to the online help system installed as part of the component.

Enterprise System Management Consoles (ESMCs)

You can run ISC components from the ISC Console itself or from within an Enterprise System Management Console (ESMC). Any of these will provide automatic discovery of servers, server security, and LAN-based and/or phone-page alerts.

ESMCs are used in an enterprise-wide environment to manage a complex organization of networks. They may include performance monitoring, load balancing, optimization, report generation and traffic analysis. ISC will work with any of the following ESMCs:

- H-P OpenView† Network Node Manager (NNM)

- CA Unicenter† TNG

To use the ISC tool modules with an ESMC, select the appropriate Integration Agent when you are installing the ISC software.

OpenView

The H-P OpenView Network Node Manager Console automatically detects servers running the ISC Platform Instrumentation software. ISC-enabled servers display on the network map, and an "Intel Server Control" applet is added as an option in the Tools menu.

Unicenter TNG

Unicenter TNG automatically detects servers running the ISC Platform Instrumentation software if the ISC discovery service is enabled. The service can be started either from the Auto Discovery dialog or from the Windows NT Services applet. The discovery service creates a new "Intel Server Control" object for each ISC-enabled server. The ISC objects display under "ISC World View."

Connecting to a Remote Server

There are several methods for connecting to a server for management. A key to effective management is to configure your system with methods that will allow you to communicate with the server in conditions ranging from fully functional to powered-off. The available connections are:

- Analog telephone modem
- Local Area Network (LAN)
- Intelligent Chassis Management Bus (ICMB)
- Local Direct connection

The connection methods are described in the following paragraphs.

Telephone

A telephone/modem connection may be used to communicate with a managed server.

A telephone connection is particularly useful when the managed server is not communicating with the local area network, such as when the server is hung or powered-off.

Using a telephone line to connect to an unpowered server requires that the modem connected to the server be powered on.

From the Console

With a modem installed in both the client console system and the remote server, you can connect to the server using DPC or Client SSU.

Using the modem connection via the Direct Platform Control (DPC), you can

- Reset the remote server's power
- Reboot the remote server using the service partition

✎ NOTE

Direct Platform Control is an optional application that may not be installed on this system. Look for the DPC icon in the right-hand pane of the ISC Console. To install DPC, rerun the installation program on the ISC CD-ROM.

From the Remote Server

The remote server may be set up to send messages to your console via the telephone connection.

Setting Up a Telephone Connection

Using a telephone connection requires:

- A modem on both the managed server and the client workstation.
- A server with on-board emergency management features.

In order to use a telephone/modem link to a server, you must configure a serial connection on both the managed server and the client workstation.

LAN

The "normal" method of communicating with a managed server is via a network connection. All of the server-management tools will work via a network connection.

A network connection is dependent upon the network working. When LAN communication is not possible, use the telephone/modem link to connect to the managed server.

ICMB

ICMB may be used to communicate with platforms with operating systems or architectures that are not otherwise supported by the server management tool applications.

Using the ICMB connection requires that you have a functioning LAN connection to a server that is connected via ICMB to the managed server.

Setting Up an ICMB Connection

An ICMB connection requires:

- A managed server with an ICMB interface.
- A server with an ICMB interface, connected to the server management console.

See the Product Guide for the managed server for information about setting up an ICMB connection.

Direct Connection

With a direct serial link connection to the managed server, you can use the System Setup Utility to set up and configure the server, and manage hardware components.

Setting Up a Direct Connection

The direct connection method has the same requirements as the telephone/modem method described previously. Connect the managed server and the workstation client using a null-modem serial cable. Refer to the Product Guide for the managed server for information about configuring the serial port.

Paging an Administrator

Platform Event Paging (PEP)

Platform Event Paging allows the managed server to alert a system administrator of critical system failures and state changes, independent of the state of the operating system or server management software. Platform Event Paging uses a numeric paging service via an external modem.

Platform Event Paging can generate pages during pre-boot and post-boot states—the only requirement is that the Baseboard Management Controller (BMC) is functional.

The managed server's SSU setup provides a configuration for the paging string and event filters. The paging string contains all the information to connect to the pager and the message to send. The Platform Instrumentation Control tool also has a dialog for configuring the same paging string.

When notified by a page, an administrator can use the server management tools to remotely view server health/status, system logs, and current configuration; reconfigure, reset or power off /on the server; or execute off-line diagnostics to further analyze the condition of the server.

Pages can be configured for the following events:
- Temperature Sensor out of range
- Voltage Sensor out of range
- Chassis Intrusion [Security Violation]
- Power Supply Fault
- BIOS: Uncorrectable ECC error
- BIOS: POST Error Code
- FRB Failures
- Fatal NMI (NMI from source other than Front Panel NMI or Uncorrectable ECC Error)
- Watchdog Timer reset, power down, or power cycle
- System restart (reboot)
- Fan failures

Server Event Notifications

The server's Local Response Agent can be configured to shut down a server, broadcast messages, make a local alarm beep, send a page to an administrator, and other actions. Use the Platform Instrumentation Control tool to configure an LRA page. See page 8 for more information about Platform Instrumentation.

Using the Intel Server Control Console

ISC Console Controls

The ISC Console provides basic server management functions. It allows you to run Platform Instrumentation Control (PIC), Direct Platform Control (DPC), DMI Explorer, and Client System Setup Utility (CSSU). The ISC Console provides you with the ability to:

- Discover ISC servers
- Discover management tools on discovered servers
- Launch the management tools on the managed servers

Intel Server Control Console Main Screen

The following figure shows the Intel Server Control Console.
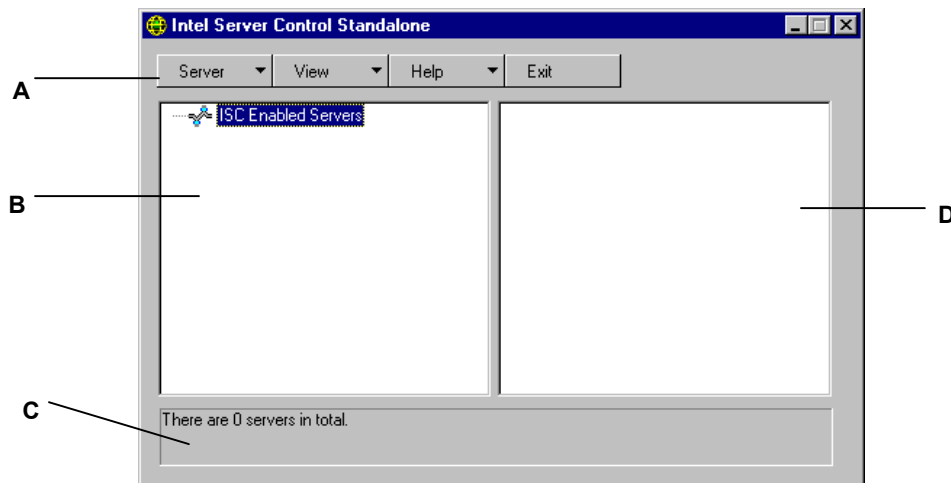
A	Button bar
B	Navigation Pane
C	Status Bar
D	Tool Pane

ISC Console Button Bar

The ISC Console includes a navigation pane (tree view) on the left and a tool pane (list or icon view of tools) on the right. Servers that are discovered are added to the tree view. When you select a server from the tree, the tool pane shows a list of supported "tools" running on that server. Launch the supported tool by double-clicking on the icon in the tool pane.

The Button Bar includes the following options:

Item	Options
Server Menu	**Discover:** Start server discovery
	Add: Manually add a server to the tree
	Delete: Delete the selected server from the tree
	Delete All: Delete all servers from the tree
	Stop Discovery: Stops server discovery
View Menu	**List View:** View the tool list as a list
	Icon View: View the tool list as icons
Help Menu	**Contents:** Accesses ISC Console help topics
	About ISC Console: Displays ISC Console version information
Exit	Exit ISC Console

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.

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

Information on servers discovered by 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 to update the tool list for that server.

Add

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

To add a server with an IP address, do the following steps:

1. On the Button Bar, click the Server > Add menu selection.
2. Choose a radio button for the IP label.
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.
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.

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 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.

Stop Discovery

Stops the discovery process. Only valid during a discovery.

View Menu Options

Icon View/List View

Changes the format of the icons in the Tool Pane.

The Navigation Pane

The Navigation pane shows a tree view of servers with management tools that have been discovered. The tree view has expansion icons ("+" or "-") appearing to the left. The tree can be expanded to list managed servers or collapsed to hide managed servers.

The 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 the tool icon in the tool pane.

The DPC or CSSU application icons will not appear in the tool list for servers discovered by the ISC console application unless the ISC platform instrumentation (PI) software is running on the server during discovery or an entry for the server exists in the DPC or CSSU phonebook.

The 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 discovery. During discovery the status bar displays the number of ISC servers and the number of servers being discovered. When the number of servers being discovered equals zero, discovery is complete.