

# Intel® Server Control User's Guide

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# About Intel Server Control

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## NOTE

This section describes the **Intel Server Control (ISC) server-management package**. See **Using the Intel Server Control Console** if you are looking for information about using the ISC Console.

## Introducing Intel Server Control

Intel Server Control (ISC) 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 Intel Server Control 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, Client System Setup Utility (CSSU), and Remote Diagnostics.

The ISC Console will run by itself, within a web browser or under Microsoft Management Console. The ISC Console provides you with the ability to discover servers with ISC management tools.

The ISC Console is installed whenever one of the other components is installed.

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

**Platform Instrumentation Control (PIC):** Platform Instrumentation Control (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 Platform Instrumentation Control for summary information, and click the Help button in the PIC Console for detailed information.

**Direct Platform Control:** Direct Platform Control 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 with the Emergency Management Port (EMP) on the server. The access path is via modem or via direct serial connection.

**Remote Diagnostics:** Remote Diagnostics consists of Modular Test Architecture (MTA) diagnostic tests on the managed server's Service Partition. These tests can be used to validate and isolate problems in the server. The tests are controlled via a text-based console redirected to the client workstation from DPC.

See Direct Platform Control and Remote Diagnostics for summary information, and click the Help button in the DPC Console for detailed information.

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

See Client System Setup Utility for summary information, and 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 DMI Explorer for summary information.

## Finding the Right Tool

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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 for more information.

<b>Managed Server Status</b>	<b>Potential Remote Tasks</b>	<b>Access</b>	<b>Tools Available</b>
The operating system is running and the server is online. Applications are running.	Update software Shutdown	LAN	Platform Instrumentation Control DMI Explorer
Operating System is running but the server is offline or otherwise malfunctioning.	Inspect Remedy Restart	LAN/ Local	Platform Instrumentation Control
The server runs its BIOS and Power On Self Test successfully.	Redirect Console Boot Service Partition	POTS	Direct Platform Control Client System Setup Utility Remote Diagnostics
The server is off, hung, or won't boot. (Standby power enabled)	View history Run hardware diagnostics Update drivers Examine state Restart	POTS	Direct Platform Control Remote Diagnostics

# Managing Remote Servers

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## 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.

<b>Administer</b>	<ul style="list-style-type: none"><li>• Monitoring system status</li><li>• Tracking system history</li><li>• Managing system assets</li></ul>
<b>Alert</b>	<ul style="list-style-type: none"><li>• Configure sensor thresholds</li><li>• Configure alert actions</li><li>• Respond to alerts received from the managed server</li><li>• Configure Predictive Failure Notification</li></ul>
<b>Act</b>	<ul style="list-style-type: none"><li>• Restoration</li><li>• Diagnosis</li><li>• Updating the system</li><li>• Configuration</li><li>• Repair</li></ul>

The tools used for the various server management tasks are described below, under **Server Management Tools**. See **Management Consoles** later in this chapter for a description of the available management consoles. The different methods for communicating with a managed server are described in **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**

#### **Remote Diagnostics**

#### **DMI Explorer**

## Platform Instrumentation Control

Platform Instrumentation Control (PIC) works with Microsoft Windows NT<sup>†</sup>, NetWare<sup>†</sup>, and UnixWare<sup>†</sup> server systems, 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 with Desktop Management Interface 2.0 (DMI 2.0) commands.

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 can not 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
- Shutting down 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 they are implemented on the server, you can also view SCSI controller status and LAN adapter 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 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 with the Emergency Management Port (EMP) on the server. The access path is via modem or via direct serial connection. DPC also works via a redirected text-based console. Since DPC does not communicate with the server-resident 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
- Run Remote Diagnostics on a managed server's Service Partition

## 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 management consoles.

## The Service Partition and Remote Diagnostics

Remote Diagnostics are available on a service partition on a hard drive on the managed server.

To use the remote diagnostics, a system manager needs to connect to the server with Direct Platform Control then reboot to the service partition. After the server reboots, the remote diagnostics become available and the system manager can use them for testing server hardware.

### What is the Service Partition?

Both the Client System Setup Utility and Remote Diagnostics rely on the server's Service Partition. The Service Partition is installed on a separate file system partition, and includes the ROM-DOS operating system, SSU and Diagnostics agents/tests. It provides a standard communication stack that can be used over a modem or a serial port to provide remote control of the SSU, diagnostics 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.

### Remote Diagnostics

Remote Diagnostics consists of Modular Test Architecture (MTA) diagnostic tests resident on the Service Partition. The tests can be controlled via a menu maintained on the Service Partition and a text-based console redirected to the client workstation.

## 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.



## Management Consoles

Server management tools such as Platform Instrumentation Control, Direct Platform Control, and the Client System Setup Utility run as components within a server management console. Server management consoles provide the basic functions of establishing connections with remote systems, displaying server or network status, and launching the tool applications.

Server management consoles range from basic versions that are used with single servers to complex versions that are used with complex enterprise-wide network systems.

## Server Management Consoles

Server Managers are used in small-office environments to manage a single server or a small number of servers. Server Managers provide the tools to find servers on a network (“discovery”), view multiple servers, receive LAN-based alerts from the remote servers, and control the security of the server.

The Intel Server Control Console provides a straightforward and inexpensive Server Management Console when used by itself, within an ActiveX-enabled web browser, or Microsoft Management Console.

## Workgroup Management Consoles

Workgroup Management Consoles are used in small-business or department environments to manage a network of servers. They may include autodiscovery of servers, enhanced security, paging alerts, and report generation.

Intel LANDesk® Server Manager (LDSM) is a Workgroup Management Console. To use the ISC tool modules with LDSM, select the LDSM Integration Agent when you are installing the ISC software. When LDSM establishes a connection with a server that is running the ISC Platform Instrumentation software, a “Intel Server Control” launch point is added to the snap-in branch of the LDSM navigation tree. LDSM may also add “Intel Server Control” as an option in the “Snap-In” branch, depending upon the version of LDSM.

## Enterprise Management Consoles

Enterprise Management Consoles are used in an enterprise-wide environment to manage a complex organization of networks. They may include performance monitoring, load balancing, optimization, and traffic analysis.

HP OpenView NNM† and CA Unicenter TNG† are enterprise management consoles. To use the ISC tool modules with an enterprise management console, select the appropriate Integration Agent when you are installing the ISC software.

## OpenView

The HP 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 to 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

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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:

- Telephone
- Local Area Network (LAN)
- Intelligent Chassis Management Bus (ICMB)
- Local Direct

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 a battery-backed-up management card be installed in the server.

## 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, and upon the operating system and networking application working correctly on the managed server.

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

With a direct connection to the managed server via a serial link, you may use the System Setup Utility to set up and configure the server, perform BIOS and other firmware upgrades, manage hardware components, and perform off-line diagnostics. On servers running Windows NT, you may also use Platform Instrumentation Control to monitor server health, configure alerts, set thresholds, and monitor the system logs.

## Setting Up a Direct Connection

The direct connection method is the same 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

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## 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—all that is required is that the Baseboard Management Controller is functional and there is power to the system.

The managed server's BIOS 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 "What is Platform Instrumentation?" for more information.

# Using the Intel Server Control Console

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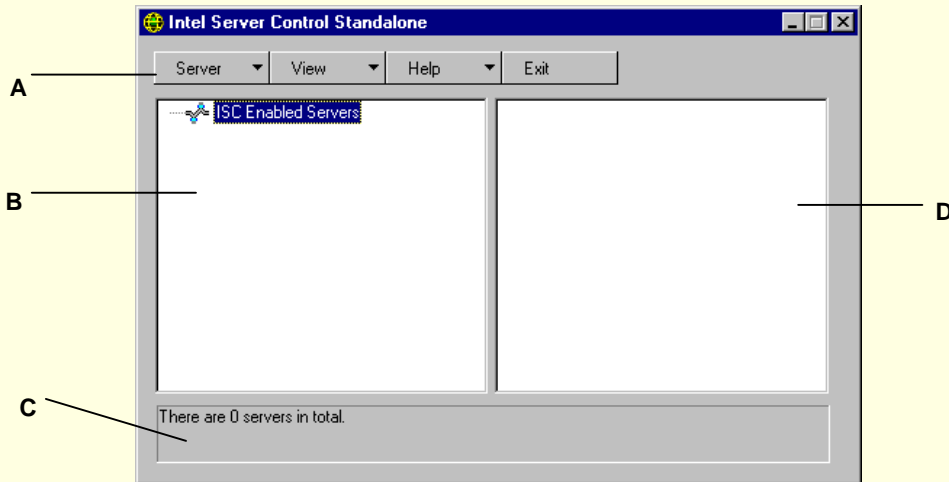
## ISC Console Controls

The Intel Server Control Console is a lightweight management console that provides basic server management functions. It allows you to run Platform Instrumentation Control (PIC), Direct Platform Control (DPC), DMI Explorer, Client System Setup Utility. The ISC Console will run by itself, within a web browser or under Microsoft Management Console. 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 Tool Pane
- D Status Bar

## 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. Launch the supported tool from the presentation pane by double-clicking on the icon.

The Button Bar includes the following options:

Item	Options
Server Menu	<b>Discover:</b> Start server discovery <b>Add:</b> Manually add a server to the tree <b>Delete:</b> Delete the selected server from the tree <b>Delete All:</b> Delete all servers from the tree
View Menu	<b>List View:</b> View the tool list as a list <b>Icon View:</b> View the tool list as icons
Help Menu	<b>Contents:</b> Accesses ISC Console help topics <b>About ISC Console:</b> 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.

## 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 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.