xSeries Systems Management

IBM

IBM Diagnostic Data Capture 1.0 Installation and User's Guide

> **Note**
>
> Before using this information and the product it supports, read the general information in Appendix C, "Notices," on page 35.

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About this book

This book describes IBM® Diagnostic Data Capture 1.0. You can use this product to monitor and analyze memory dumps for supported IBM @server® xSeries® servers.

How this book is organized

Chapter 1, "Introducing Diagnostic Data Capture," on page 1 contains an overview of Diagnostic Data Capture, including its components and features.

Chapter 2, "Installing Diagnostic Data Capture," on page 7 details the system requirements for Diagnostic Data Capture. This chapter also describes how to install and uninstall Diagnostic Data Capture on management servers and client systems.

Chapter 3, "Configuring the management server," on page 17 describes how to add and remove client systems to and from the management server, how to stop monitoring a client system, and how to configure memory dump settings for the management server.

Chapter 4, "Managing memory dumps," on page 25 describes notifications of memory dumps, location of memory dump files, how to analyze and manage memory dump files, and the log files that are generated by Diagnostic Data Capture. This chapter also explains how to uncompress memory dump files.

Appendix A, "Terminology summary and abbreviation list," on page 31 contains a summary of Diagnostic Data Capture terminology and a list of abbreviations that are used in Diagnostic Data Capture documentation.

Appendix B, "Getting help and technical assistance," on page 33 contains information about accessing IBM Support Web sites for help and technical assistance.

Appendix C, "Notices," on page 35 contains product notices and trademarks.

The "Glossary" on page 37 provides definitions for terms that are used in Diagnostic Data Capture documentation.

Notices that are used in this book

This book contains the following notices designed to highlight key information:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or difficult situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

Diagnostic Data Capture documentation

The Web site for Diagnostic Data Capture provides the *Diagnostic Data Capture 1.0 Installation and User's Guide* in Adobe Acrobat Portable Document Format (PDF).

You can also obtain this document from the IBM Support Web site at http://www.ibm.com/pc/support/.

Additionally, the *Remote Supervisor Adapter II, User's Guide* might be of interest. You can obtain this documentation from the IBM Support Web site.

Diagnostic Data Capture resources on the World Wide Web

The following Web pages provide resources for understanding, using, and troubleshooting IBM xSeries servers and products.

IBM Support page

http://www.ibm.com/pc/support/

This is the IBM Support Web site for IBM hardware and systems-management software. For systems-management software support, click **Systems management**.

IBM Systems Management Software: Download/Registration page

http://www.ibm.com/pc/us/eserver/xseries/systems_management/dwnl.html

Use this Web page to download IBM systems-management software, including IBM Director.

IBM xSeries Systems Management page

http://www.ibm.com/pc/ww/eserver/xseries/systems_management/index.html

This Web page presents an overview of IBM systems management and IBM Director.

IBM ServerProven® page

http://www.ibm.com/pc/us/compat/index.html

This Web page provides information about IBM hardware compatibility with IBM systems-management software.

Chapter 1. Introducing Diagnostic Data Capture

IBM Diagnostic Data Capture is a program that captures, analyzes, and manages memory dumps that are generated from operating-system failures on supported xSeries systems. With these features, Diagnostic Data Capture can help you reduce problem-determination time and enable trend analysis.

Diagnostic Data Capture uses the features of Microsoft® Windows® 2003 and the Remote Supervisor Adapter II to capture all memory dumps. By using the Remote Supervisor Adapter II as a secondary memory dump logging device, Diagnostic Data Capture is able to acquire memory dumps that occur on multiple servers. Diagnostic Data Capture transfers these memory dumps to a remote server so you can debug the memory dump without directly accessing the server that originated the memory dump.

Diagnostic Data Capture has two software components that are installed on different servers in your network:

- Diagnostic Data Capture Server is installed on the server that you want to use as the *management server*. This component provides a system tray control, a graphical user interface, and a listener service. For more information, see "Diagnostic Data Capture Server" on page 3.
- Diagnostic Data Capture Client Driver is installed on every *client system* that you want to monitor for memory dumps. For more information, see "Diagnostic Data Capture Client Driver" on page 6.

Figure 1 on page 2 provides an overview of a server network that uses Diagnostic Data Capture.

All Remote Supervisor Adapter IIs are connected to the management server through an Ethernet LAN

Management server

Diagnostic Data Capture Server installed; storage for memory dumps from client systems

Client systems

Client systems

Diagnostic Data Capture Client Driver installed on each client system
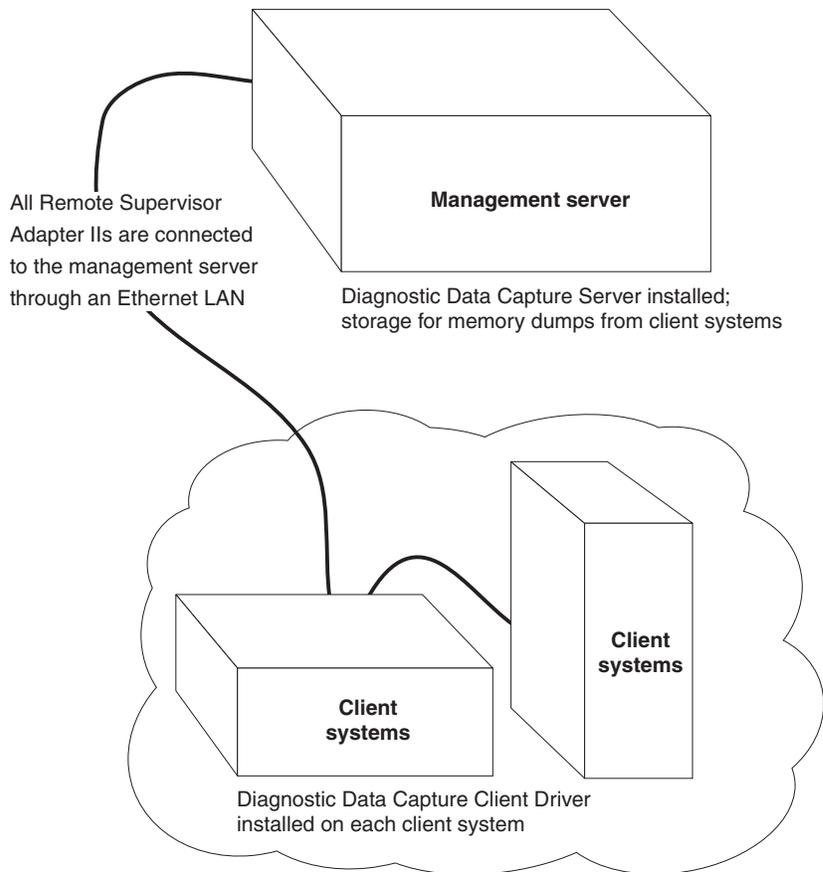
Figure 1. Overview of Diagnostic Data Capture

Notes:

1. Service-processor networks that are using Dynamic Host Configuration Protocol (DHCP) must also use Domain Name Service (DNS). If the network uses only DHCP, Diagnostic Data Capture Server configures static Internet protocol (IP) addresses for the service processors on the client systems and for the management server.

   This becomes a problem when the IP address of a service processor or the management server expires. When this happens, you must add the client system to the management server again. Otherwise, Diagnostic Data Capture can no longer collect memory dumps from that client system.

2. The management server and the service processors on the client systems must all be members of the domain that includes the DNS server. Otherwise, Diagnostic Data Capture Server configures static IP addresses for the service processors on client systems and for the management server. When DHCP renews the IP addresses for these servers, Diagnostic Data Capture Server will be unable to communicate with the service processors. Alternatively, you can configure all service processors and the management server to use static IP addresses outside of the DHCP network.

Diagnostic Data Capture Server

Diagnostic Data Capture Server provides a system tray control, a graphical user interface, and a listener service. Together, these components provide all the functionality of Diagnostic Data Capture on the management server.

System tray control

After you install Diagnostic Data Capture Server, the system tray on the management server includes a Diagnostic Data Capture system tray control. This system tray control is identified by the ![icon] icon when the listener service is running. (When the listener service is stopped, the ![icon] icon is used for the system tray control.) By right-clicking the icon for this system tray control, you can access features of Diagnostic Data Capture Server as shown in Figure 2.
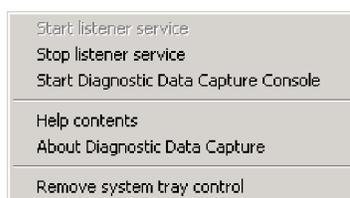
Figure 2. Diagnostic Data Capture system tray control menu

If you do not want this system tray control in your Windows task bar, complete the following steps to remove it:

1. Right-click the Diagnostic Data Capture system tray control.
2. Click **Remove system tray control**.

Diagnostic Data Capture Console

Diagnostic Data Capture Console provides a graphical user interface that you can use to perform the following functions:

- Identify client systems that the management server monitors for memory dumps
- Configure port and directory path settings for Diagnostic Data Capture Server
- View and analyze memory dumps that are collected from client systems
- Access the help system for Diagnostic Data Capture

Diagnostic Data Capture Console uses the Microsoft Debugging Tools for Windows to open and analyze memory dump files.

Note: Debugging Tools for Windows is not part of Diagnostic Data Capture. You must obtain this software directly from Microsoft. For more information, see "Installing Debugging Tools for Windows on the management server" on page 12.

Starting Diagnostic Data Capture Console

Complete the following steps to start Diagnostic Data Capture Console:

1. Right-click the Diagnostic Data Capture system tray control.
2. Click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

You can also start Diagnostic Data Capture Console by clicking **Start → Programs → IBM Diagnostic Data Capture → IBM Diagnostic Data Capture Console**.

The "Diagnostic Data Capture" window

After you start Diagnostic Data Capture Console, the "Diagnostic Data Capture" window opens and displays two panes. These panes provide a graphical user interface for configuring client systems and managing memory dumps. Figure 3 shows a typical "Diagnostic Data Capture" window.

Figure 3. "Diagnostic Data Capture" window

The left pane identifies all the client systems that have been configured on the management server. For each row, Diagnostic Data Capture indicates whether it is monitoring the client system (if it is, the **Listen** check box is selected for the client system), the host name of the client system, and the IP address of the client system. For more configuration information, see "Adding client systems to the management server" on page 17.

The left pane also indicates whether the listener service is running and whether Diagnostic Data Capture can communicate with the service processor of each client system as follows:

- If all the **Listen** check boxes with check marks in the left pane have a normal white background, the listener service is running and Diagnostic Data Capture can communicate with the service processors in all the client systems.
- If all the **Listen** check boxes with check marks have a red background, the listener service is stopped and Diagnostic Data Capture cannot communicate with any service processors in the client systems.
- If some **Listen** check boxes with check marks have a white background and some **Listen** check boxes with check marks have a red background, the listener service is running, but Diagnostic Data Capture cannot communicate with the service processors on those client systems indicated by the red background on the **Listen** check boxes. This situation can happen when the service processor in a client system is powered-off.

For more information about the listener service, see "Listener service" on page 5.

The right pane lists the memory dumps that have been gathered for the management server and the memory dump reports that have been created. Each row lists one memory dump or memory dump report. For each row, Diagnostic Data Capture indicates the file name, the size of the file, and the file modification date.

By default, Diagnostic Data Capture Server stores the files shown in the right pane in the c:\DDC\Memory_Dumps directory. For information about changing this directory, see "Configuring default settings for the management server" on page 21.

For more information about the location and naming convention that is used for memory dumps, see "Finding memory dumps collected from client systems" on page 25.

Help system for Diagnostic Data Capture

The help system for Diagnostic Data Capture describes all components and features of Diagnostic Data Capture, including the client driver, listener service, and system tray functionality. The help system is provided in hypertext markup language (HTML) files.

Use one of the following methods to access the help system:

- Start Diagnostic Data Capture Console; then, click **Help** → **Contents** in the "Diagnostic Data Capture" window. Diagnostic Data Capture displays the table of contents for the help system.
- Right-click the Diagnostic Data Capture system tray; then, click **Help contents**. Diagnostic Data Capture displays the table of contents for the help system.
- Display an individual task window in Diagnostic Data Capture Console, for example, the "Configuration settings" window; then, click **Help**. On those windows, Diagnostic Data Capture displays context-specific help topics.

Use the links within a help topic and at the bottom of each help topic to navigate the help system that is provided for Diagnostic Data Capture.

Listener service

The listener service runs in the background as an operating-system service. After you install Diagnostic Data Capture Server, the listener service starts on the management server. Further, the listener service automatically starts each time the management server is started. When the listener service is running, it performs the following functions:

- Listens to a designated port on the network for notifications that a memory dump has occurred on a client system. For information about designating the port that is used by the listener service, see "Configuring default settings for the management server" on page 21.
- After a notification occurs for a client system, retrieves the memory dump from the client system and saves it to disk on the management server.
- After the memory dump is transferred to the management server, notifies Diagnostic Data Capture Server that a new memory dump is available. For details, see "Memory dump notifications" on page 25.

You can determine whether the listener service is running or stopped by examining the icon for the Diagnostic Data Capture system tray control. Table 1 describes the icons that are used.

Table 1. System tray control icons for the listener service

Icon	Description
	The listener service is running.
	The listener service is stopped.

From the "Diagnostic Data Capture" window, you can determine the status of the listener service by examining the **Listen** check box for each client system that is configured. If the **Listen** check boxes with check marks have a normal white background, the listener service is running. If the **Listen** check boxes with check marks have a red background, the listener service is stopped.

You can also determine the status of the listener service by examining the services that are available to the operating system on the management server. The Diagnostic Data Capture listener service is identified as the IBMDDCService. To access Windows services from the Control Panel, double-click **Administrative Tools** and double-click **Services**.

Starting the listener service

Complete the following steps to start the listener service:

1. Right-click the Diagnostic Data Capture system tray control.
2. Click **Start listener service**.

Stopping the listener service

Complete the following steps to stop the listener service:

1. Right-click the Diagnostic Data Capture system tray control.
2. Click **Stop listener service**.

Diagnostic Data Capture Client Driver

Diagnostic Data Capture Client Driver is the component of Diagnostic Data Capture that is installed on each supported client system that you want to monitor with Diagnostic Data Capture Server. For information about the supported client systems, see "Requirements for client systems" on page 8.

The client driver performs the following functions:

- Registers with the operating system as a device driver.
- Uses the service processor as a secondary dump device so it can receive memory-dump data.
- Sends the memory dump to the listener service on the management server.

Chapter 2. Installing Diagnostic Data Capture

This chapter provides information about system requirements, supported servers and operating systems, and instructions for installing and uninstalling Diagnostic Data Capture 1.0.

System requirements

Diagnostic Data Capture has different requirements for management servers and client systems.

Requirements for management servers

You can use Diagnostic Data Capture Server on any management server that is running one of the following operating systems:

- Microsoft Windows XP Professional (Service Pack 1 or later required)
- Windows 2000 Professional, Server, and Advanced Server (Service Pack 3 or later required)
- Windows Server 2003, Standard, Enterprise, Datacenter, and Web Editions

Diagnostic Data Capture Server requires a variable amount of disk space that is based upon these factors:

- The number of client systems that you plan to configure for the management server.
- The amount of memory on each client system.
- The type of memory dump configured for each client system.

   Complete memory dumps are as large as the amount of memory in the system, kernel memory dumps are smaller and contain only kernel and active process memory, and small memory dumps, which are limited to 64 KB.

- The frequency of memory dumps that you anticipate for each client system.
- How long you want to retain the memory dumps on disk.

For example, if a client system is configured to produce full memory dumps and that system has 1 GB of memory, any memory dump from that system will be 1 GB. If you have 10 such systems configured for one management server, that management server needs 10 GB of disk space for one memory dump from each client system. If you anticipate that these systems will produce approximately one memory dump per week and you intend to keep these memory dumps on disk for only four weeks, you need 40 GB of disk space.

Notes:

1. You must make sure that the management server has enough disk space for the memory dumps from the client systems. If there is not enough disk space, Diagnostic Data Capture Server is unable to write the memory dump to disk on the management server.

2. A client system that is configured for full memory dumps can create a memory dump file that is equal to the amount of physical memory in the client system. However, the operating system can limit a full memory dump on some systems because of the amount of installed physical memory. Diagnostic Data Capture cannot affect this operating-system limitation.

Requirements for client systems

You can use Diagnostic Data Capture Client Driver with xSeries 345 servers that have a Remote Supervisor Adapter II service processor. These servers must be running Windows Server 2003 (Standard, Enterprise, Datacenter, or Web Edition).

Diagnostic Data Capture Client Driver requires a very minimal amount of disk space.

Downloading Diagnostic Data Capture from the World Wide Web

Complete the following steps to download Diagnostic Data Capture from the IBM Web site:

1. Go to http://www.ibm.com.
2. Click **Support & Downloads**.
3. Click **Downloads & drivers**.
4. In the **Enter search terms** field, type `Diagnostic Data Capture` and click Submit.
5. Click **Systems Management - Diagnostic Data Capture 1.0**.
6. Click the file link for the executable file to download the file.

   Additionally, you can download the ddc100_readme.txt file and the *Diagnostic Data Capture 1.0 Installation and User's Guide* from this Web page.
7. Copy the downloaded file to a local drive on each management server and client system on which you want to install Diagnostic Data Capture.

Installing Diagnostic Data Capture Server

Diagnostic Data Capture Server is the management component of Diagnostic Data Capture. When it is installed on a server, it provides Diagnostic Data Capture Console and the listener service. You have to install this component on only one server in your network.

Complete the following steps to install Diagnostic Data Capture Server:

1. From the system on which you want to install Diagnostic Data Capture Server, run the executable file that you downloaded.

   Note: The operating-system account that is used to install Diagnostic Data Capture Server must have at least local administrator authority.

   The Diagnostic Data Capture Setup program starts, and the "Welcome to the InstallShield Wizard for Diagnostic Data Capture" window opens.
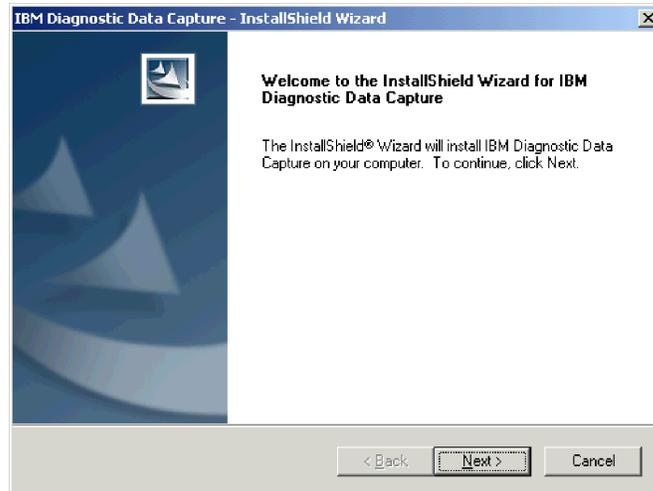
Figure 4. "Welcome to the InstallShield wizard" window

2. Click **Next**. The "License Agreement" window opens.
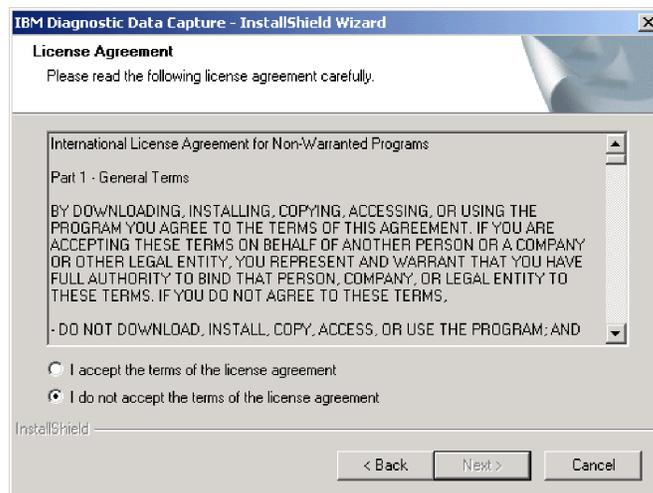
Figure 5. "License Agreement" window

3. Read the license agreement; then, click **I accept the terms in the license agreement** and click **Next**. The "Select Features" window opens.
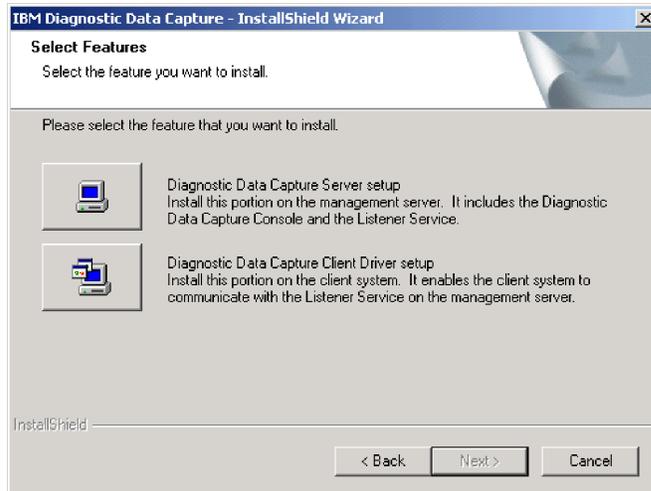
Figure 6. "Select Features" window

4. Click the icon next to Diagnostic Data Capture Server. The "Added steps for Diagnostic Data Capture Server install" window opens.
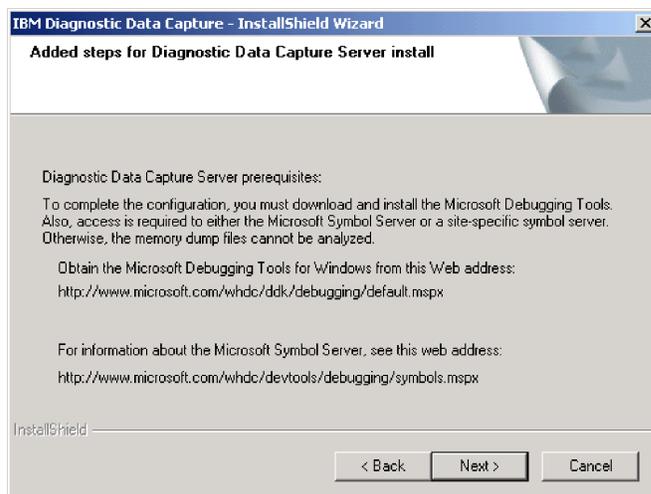
Figure 7. "Added steps for Diagnostic Data Capture Server install" window

5. If necessary, write down the Web addresses for the Microsoft Debugging Tools for Windows and the Microsoft Symbol Server. For more information, see "Completing the installation on a management server" on page 12.

6. Click **Next**. The "Choose Destination Location" window opens.
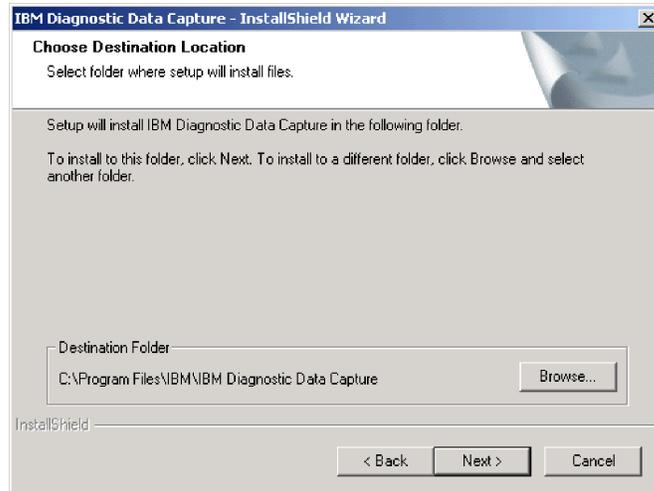
Figure 8. "Choose Destination Location" window

7. Click **Next**. The "Setup Status" window opens.
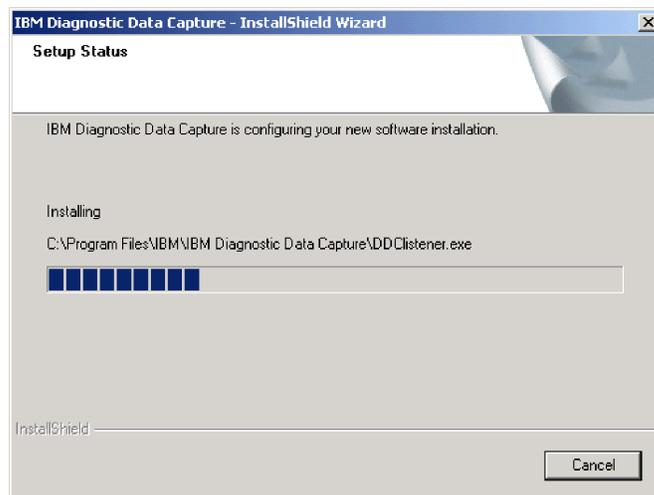
Figure 9. "Setup Status" window

When the installation is completed, the "InstallShield Wizard Complete" window opens.
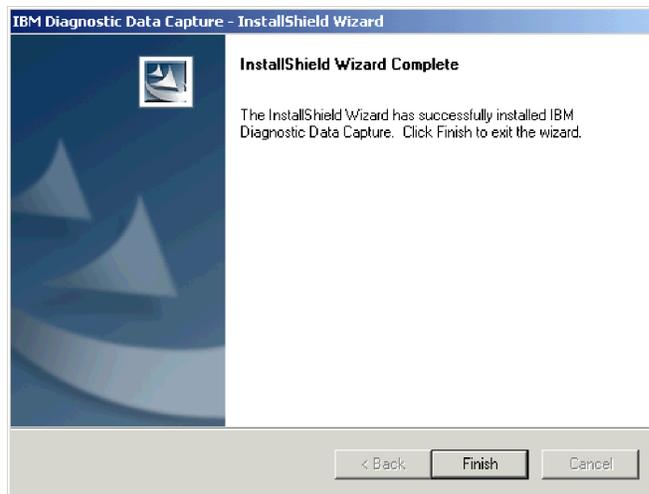
Figure 10. "InstallShield Wizard Complete" window

8. Click **Finish**.

Completing the installation on a management server

Before you can use Diagnostic Data Capture Server to analyze memory dumps that are captured from client systems, you must download and install the Microsoft Debugging Tools for Windows onto the management server that you are using. Additionally, you must understand how Diagnostic Data Capture Server uses the Microsoft Symbols Server.

Installing Debugging Tools for Windows on the management server

Complete the following steps to download and install the Microsoft Debugging Tools for Windows software:

1. Go to http://www.microsoft.com/whdc/devtools/debugging/default.mspx.
2. Click the link for the current release of the Debugging Tools for Windows 32-bit versions.
3. Follow the instructions to download and install the debugging tools on the management server. Diagnostic Data Capture was tested for use with version 6.2.13.1 from 18 July 2003. Later versions of the debugging tools might work, however, changes to commands and command syntax could affect the operation of Diagnostic Data Capture.

Using the Windows Symbol Server on the management server

By default, Diagnostic Data Capture configures the management server to use the Microsoft Windows Symbol Server that is accessed over the Internet. This symbol server provides the Windows symbol files that are needed when a memory dump file is analyzed with the Debugging Tools for Windows. For more information about the Microsoft Symbol Server, see http://www.microsoft.com/whdc/devtools/debugging/symbols.mspx.

If your management server does not have Internet access, you can configure Diagnostic Data Capture Server to use a site-specific symbol server. For details, see "Configuring default settings for the management server" on page 21.

Installing Diagnostic Data Capture Client Driver

Diagnostic Data Capture Client Driver provides the client driver component of Diagnostic Data Capture. When the client driver is installed on a server, it captures memory dumps that can be sent to Diagnostic Data Capture Server. This component of the product must be installed on every system in your network that you plan to monitor with Diagnostic Data Capture.

Note: Only windows that are unique to the installation of Diagnostic Data Capture Client Driver are illustrated in the following procedure. If a window is not shown, see "Installing Diagnostic Data Capture Server" on page 8 for an example of the window.

Complete the following steps to install Diagnostic Data Capture Client Driver:

1. From the system on which you want to install Diagnostic Data Capture Client Driver, run the executable file that you downloaded.

   Note: The operating-system account that is used to install Diagnostic Data Capture Client Driver must have at least local administrator authority.

   The Diagnostic Data Capture Setup program starts, and the "Welcome to the InstallShield Wizard for Diagnostic Data Capture" window opens.

2. Click **Next**. The "License Agreement" window opens.

3. Read the license agreement; then, click **I accept the terms in the license agreement** and click **Next**. The "Select Features" window opens.

4. Click the icon next to Diagnostic Data Capture Client Driver. The "Added steps for Diagnostic Data Capture Client Driver" window opens.
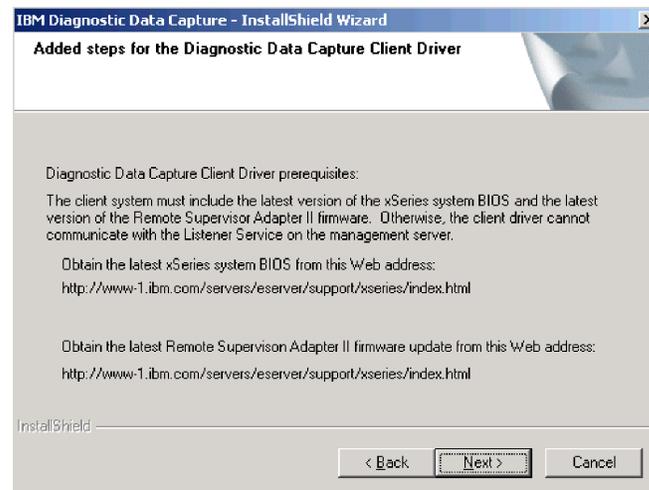
Figure 11. "Added steps for Diagnostic Data Capture Client Driver" window

5. If necessary, write down the Web addresses for the latest xSeries system basic input/output system (BIOS) and the latest Remote Supervisor Adapter II firmware. For more information, see "Completing the installation on a client system" on page 14.

6. Click **Next**. The "Setup Status" window opens, and the client driver component is saved with the other operating-system drivers, usually in c:\windows\system32\drivers.

During the installation, the "Security Alert - Driver Installation" window opens. This window opens because Microsoft does not provide the client driver for Diagnostic Data Capture.

Figure 12. "Security Alert - Driver Installation" window

7. Click **Yes** to proceed with the client driver installation.

    When the installation is completed, the "InstallShield Wizard Complete" window opens.

8. Click **Finish**.

Completing the installation on a client system

Before you can use the Diagnostic Data Capture Client Driver to monitor a client system for memory dumps, you must make sure that the client system includes the latest versions of this software:

*   xSeries system BIOS
*   Remote Supervisor Adapter II firmware

Otherwise, the client driver that is provided by Diagnostic Data Capture cannot communicate with the listener service on the management server.

Complete the following steps to download and install this software:

1. Go to http://www.ibm.com/servers/eserver/support/xseries/index.html.
2. Click **Downloads** to open the "Downloads & Drivers" page.
3. Under the "For any product" portion of the page, in the **Family** list, select **xSeries 345**.
4. Click **Continue**.
5. In the **View by document type** list, select **Downloads and drivers**.
6. In the **Filter by category** list, select **BIOS**.
7. Click the name of the latest BIOS code for the selected family and download the code.
8. Return the Web browser to the Support page for the selected family.
9. In the **Filter by category** list, select **Remote Supervisor Adapter II**.

10. Click the name of the latest firmware for the Remote Supervisor Adapter II from this list and download this firmware.
11. From the management server where you installed Diagnostic Data Capture Server, run the two executable files that you downloaded.
12. Follow the installation instructions as directed.

Uninstalling Diagnostic Data Capture

Complete the following steps to uninstall Diagnostic Data Capture:

1. If Diagnostic Data Capture Console is running, close it.
2. Click **Start → Settings → Control Panel**. The "Control Panel" window opens.
3. Double-click **Add/Remove Programs**. The "Add/Remove Programs" window opens.
4. Click **IBM Diagnostic Data Capture**.
5. Click **Remove**. The InstallShield wizard for Diagnostic Data Capture starts, and the "Welcome" window opens.
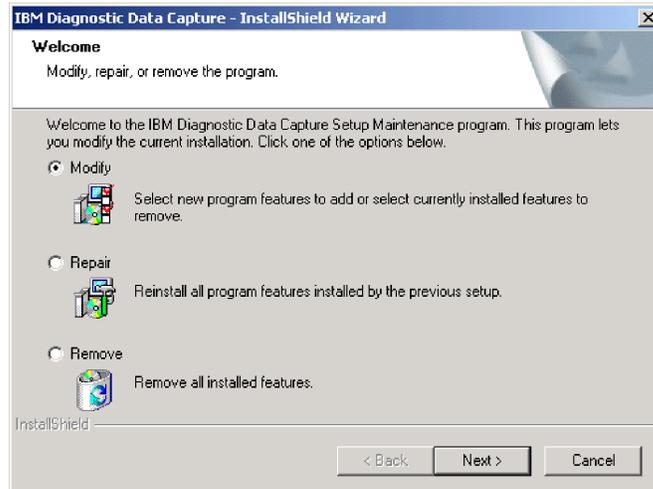
Figure 13. "Welcome" window

6. Click **Remove**; then, click **Next**.
7. When prompted about the uninstallation not removing any memory dump files or the client system list, click **OK**.
8. When prompted to remove Diagnostic Data Capture and all of its features, click **Yes**. After Diagnostic Data Capture has been uninstalled, the "Maintenance Complete" window opens.
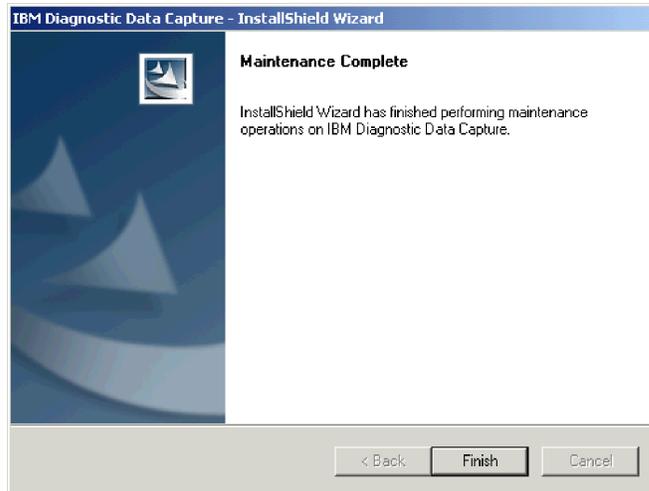
Figure 14. "Maintenance Complete" window

If any of the Diagnostic Data Capture files are in use during the uninstallation, you must restart your server to remove these files. In this case, the "Maintenance Complete" window notifies you of this information.
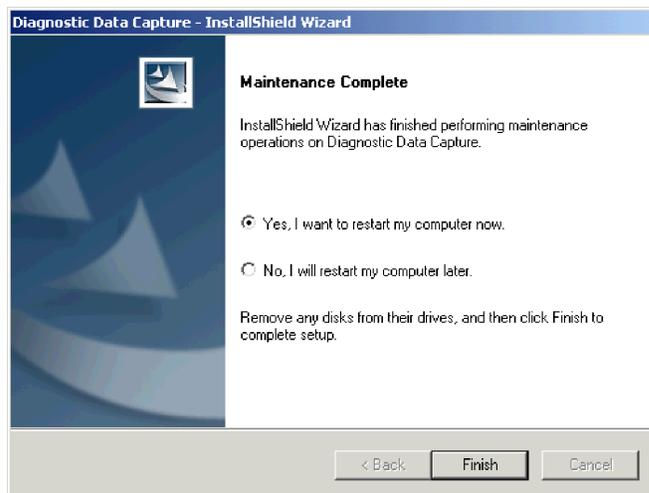
Figure 15. "Maintenance Complete" window when a restart is required

9. Click **Finish** to restart the server or select **No, I will restart my computer later** and click **Finish**.

Chapter 3. Configuring the management server

This chapter describes how to add client systems to the management server and how to configure the management server with various memory dump settings.

Adding client systems to the management server

You must add the host name or IP address of the service processor in each client system to the management server before Diagnostic Data Capture can monitor and collect memory dumps from that client system. When you do so, Diagnostic Data Capture uses the service processor of the client system as a secondary dump device. This enables the Diagnostic Data Capture Client Driver to notify the service processor of memory dump events that the listener service on the management server can act upon.

You can add client systems in several different ways. Regardless of the method that you choose to add a client system to the management server, the client systems will be added to those already configured for the management server. Further, the newly added client systems are monitored for memory dumps. If you do not want to monitor a newly added client system, see "Stopping monitoring of a client system for memory dumps" on page 20.

Note: You can add a client system to the management server when the client system does not have the Diagnostic Data Capture Client Driver installed. However, no memory dumps are collected from that client system until you also install the client driver on that client system.

Adding client systems by host name

Complete the following steps to add client systems by host name:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.
2. Click **File → Add service processor by host name**. The "Add service processor by host name" window opens.
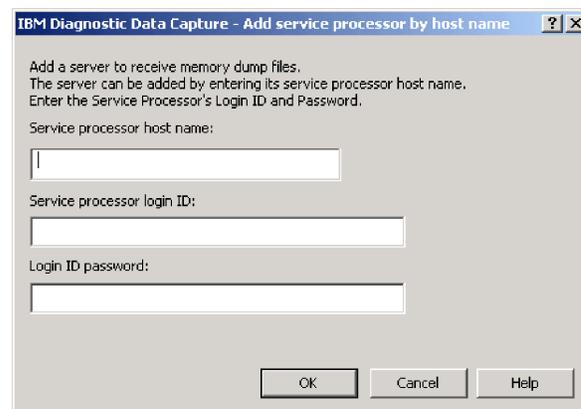
Figure 16. "Add service processor by host name" window

3. In the **Service processor host name** field, type the host name of the service processor on the client system that you want to monitor. For example, type `myhost` or `myhost.city.com`.

4. In the **Service processor login ID** field, type the login ID for the service processor.

5. In the **Login ID password** field, type the password for the login ID that you used.

6. Click **OK**. It can take several seconds for Diagnostic Data Capture Server to validate the host address when you are adding a client system.

Adding client systems by IP address

Complete the following steps to add client systems by IP address:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. Click **File → Add service processor by IP address**. The "Add service processor by IP address" window opens.
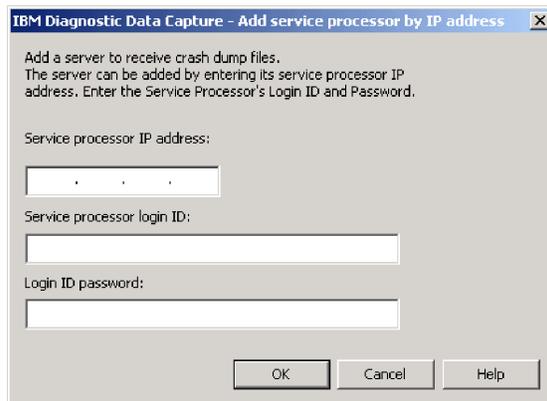
Figure 17. "Add service processor by IP address" window

3. In the **Service processor IP address** field, type the IP address of the service processor on the client system that you want to monitor. For example, type an IP address in the format `xxx.xxx.xxx.xxx`.

4. In the **Service processor login ID** field, type the login ID for the service processor.

5. In the **Login ID password** field, type the password for the login ID that you used.

6. Click **OK**. It can take several seconds for Diagnostic Data Capture Server to validate the host address when adding a client system.

Importing a file of client systems

Complete the following steps to import a comma-separated values (CSV) file that identifies client systems to monitor:

1. Use an ASCII text editor, for example, Microsoft WordPad or Visual SlickEdit, to create a CSV file that lists either the host names or the IP addresses of the client systems that you want to monitor.

   For example, you could create a file called clientlist.csv that identifies the client systems that you want to monitor. The following example shows portions of a file that defines client systems by host name:

   ```
   financials.city.com,financials.com,financials
   operations.city.com,operations.com,operations
   ```

   The following example shows portions of a file that defines client systems by IP address:

   ```
   255.255.255.255,100.100.100.10
   ```

2. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

3. Click **File → Import file of service processor hosts**. The "Import file of service processor hosts" window opens.
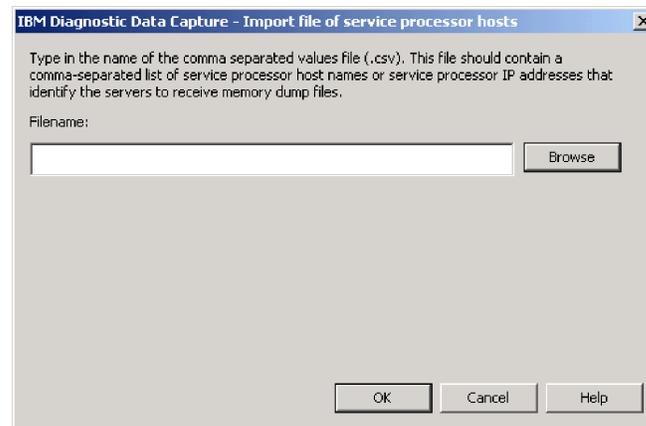
Figure 18. "Import file of service processor hosts" window

4. In the **Filename** field, type the full path name of the CSV file that identifies the client systems that you want to monitor. Alternatively, click **Browse** to navigate to the file. Click the file name and click **Open**.

5. Click **OK**.

   Diagnostic Data Capture reads through the CSV file to add the designated client systems. For each client system that is added to the management server, the "Service Processor Login ID and Password" window opens.
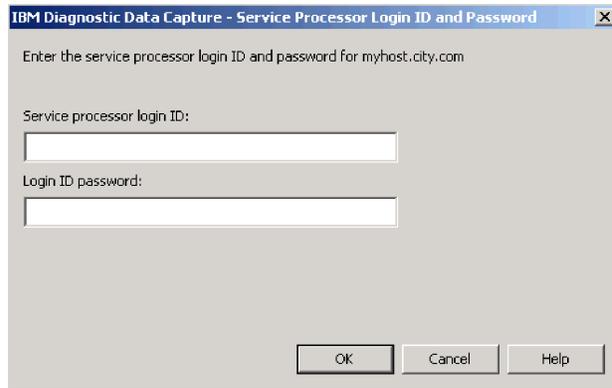
Figure 19. Importing a file of client systems: "Service Processor Login ID and Password" window

6. In the **Service processor login ID** field, type the login ID for the indicated service processor.

7. In the **Login ID password** field, type the password for the login ID that you used.

8. Click **OK**. Alternatively, you can click **Cancel** to skip the indicated service processor and proceed to the next service processor in the CSV file. It can take several seconds for Diagnostic Data Capture Server to validate the host address when you are adding a client system.

9. Repeat steps 6 through 8 until there are no more client systems to add.

Stopping monitoring of a client system for memory dumps

Complete the following steps to stop monitoring a client system for memory dumps:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. In the Listen column in the left pane, clear the check box for the client system. To begin monitoring the client system again, select the check box.

Updating the login ID or password for a service processor in a client system

If the login ID or password of the service processor in a client system changes, you must communicate this change to Diagnostic Data Capture Server. Otherwise, the listener service will be unable to obtain memory dumps from that service processor.

Complete the following steps to update the login ID or password for a service processor in a client system:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. In the left pane, right-click the row for the client system; then, click **Update login ID and password**. The "Service Processor Login ID and Password" window opens.
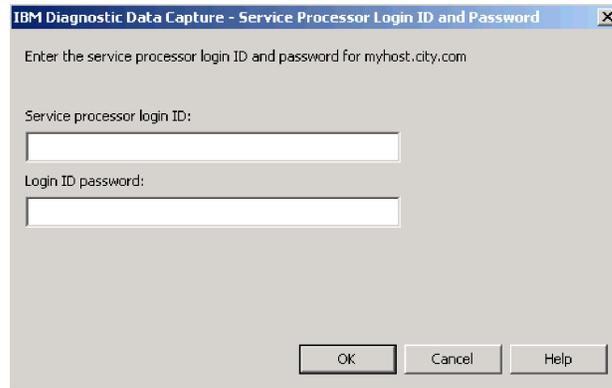
Figure 20. Updating the login ID or password: "Service Processor Login ID and Password" window

3. In the **Service processor login ID** field, type the login ID for the indicated service processor.

4. In the **Login ID password** field, type the password for the login ID that you used.

5. Click **OK**.

Deleting a client system from the management server

Complete the following steps to delete a client system from the management server:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. In the left pane, right-click the row for the client system; then, click **Delete service processor**. A window opens prompting you to confirm the deletion.

3. Click **Yes** to remove the configuration of the client system from the management server.

Configuring default settings for the management server

Diagnostic Data Capture Server is preconfigured with default values for the configuration settings on the management server. You can view or change the configuration settings by using the "Configuration settings" window.

Complete the following steps to view or change the configuration settings for Diagnostic Data Capture Server:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. Click **Options → Configuration settings**. The "Configuration settings" window opens.
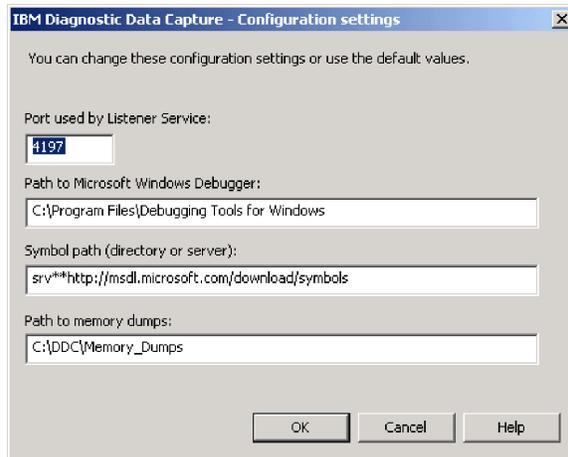
Figure 21. "Configuration settings" window

3. If necessary, change the values in any of the fields.

Port used by Listener Service
> By default, the listener service uses port 4197 to copy memory dumps from the client systems to the management server. The port number that is configured for the management server must be the same port number that is configured for the service processor of each client system that you plan to use. The port number must be a number from 1025 through 65535. It can take several seconds for Diagnostic Data Capture to update the port number that is used by the listener service.

Path to Microsoft Windows Debugger:
> By default, Diagnostic Data Capture Server looks for the Debugging Tools for Windows in the c:\Program Files\Debugging Tools for Windows directory. If the debugging tools are in a different directory, update this field with that directory path.

Symbol path (directory or server)
> By default, Diagnostic Data Capture Server uses the Microsoft Symbol Server, which is accessed over the Internet as needed during analysis of a memory dump file. Alternatively, you can set up and use your own symbol server by downloading all the Microsoft Windows Symbols into a local directory and designating that directory in the **Symbol path** field.
>
> **Note:** Diagnostic Data Capture cannot verify the accuracy of the directory or server path that you enter in the **Symbol path** field. For this reason, you must make sure that you have entered it correctly. Otherwise, Diagnostic Data Capture will be unable to analyze memory dump files.
>
> For more information about the Microsoft Symbol Server, see http://www.microsoft.com/whdc/devtools/debugging/symbols.mspx.

Path to memory dumps

By default, the directory under which to save memory dumps that are gathered from client systems is the \DDC\Memory_Dumps directory on the system drive of the management server. If you change this to a directory on a network share, you must make sure that the management server itself (not a specific user account) has valid permissions to write to the network share. Otherwise, Diagnostic Data Capture will be unable to save memory dumps to the path that you designate.

4. Click **OK**.

Chapter 4. Managing memory dumps

Use Diagnostic Data Capture to manage memory dumps on supported xSeries systems. This chapter provides information about the following topics:

- Memory dump notifications
- Finding memory dumps collected from client systems
- Managing memory dumps with Diagnostic Data Capture Console
- Examining event log files from client systems
- Uncompressing memory dump files

Memory dump notifications

When the listener service is running and a memory dump occurs on a configured client system, Diagnostic Data Capture displays a message in Diagnostic Data Capture Console to notify you as shown in Figure 22.

Figure 22. Memory dump notification message

To close this message, click **OK**.

When a memory dump occurs, Diagnostic Data Capture Server also displays a notification icon on top of the Diagnostic Data Capture system tray control. The ![icon] icon is removed automatically when you close the memory dump notification message.

Finding memory dumps collected from client systems

When memory dumps are copied to the management server, they are copied to a directory that is unique to each client system. The following naming convention is used for these memory dump directories:

d:*dump_directory*\\UUID

where

- *d* is the drive letter of the hard disk drive where the memory dump files are written. By default, this is the system drive directory.
- *dump_directory* is the directory where the memory dump files are written. By default, this is \DDC\Memory_Dumps. For information about changing this directory, see "Configuring default settings for the management server" on page 21.
- *UUID* is the universal unique identifier (UUID) that is used to identify the service processor in the client system, for example, a4e9ea9c43b44a128ffe38c8bae8f9ff.

Within each client system directory on the management server, the listener service uses the following naming convention for memory dump files that it copies from the client system:

MemDump_*YYYYMMDD_HHMMSS*.dmp

where
- *YYYYMMDD* is the year, month, and date when the memory dump file was created. For example, the date 20040503 means the file was created 3 May 2004.
- *HHMMSS* is the hour, minute, and second when the memory dump file was created. For example, the time 161648 means that the file was created at 48 seconds past 4:16 p.m.

For example, the file name for a memory dump could be C:\DDC\Memory_Dumps\ a4e9ea9c43b44a128ffe38c8bae8f9ff\MemDump_20040423_104837421.dmp.

For information about using Diagnostic Data Capture Console to view these memory dump files, see "Analyzing a memory dump to create a memory dump report" on page 27 and "Viewing a memory dump report created from analysis of a memory dump file" on page 27.

Sometimes the management server does not have sufficient disk space for Diagnostic Data Capture to uncompress a memory dump file after it has been transferred from a client system. In this case, you must manually uncompress the file before you can manage it in Diagnostic Data Capture Console. For more information, see "Uncompressing memory dump files" on page 29.

Managing memory dumps with Diagnostic Data Capture Console

From the Diagnostic Data Capture Console, you can perform the following management functions:
- Open a memory dump in Debugging Tools for Windows
- Analyze a memory dump to create a memory dump report
- View a memory dump report created from analysis of a memory dump
- Save a file under a different name
- Delete a file from the management server

Opening a memory dump in Debugging Tools for Windows

Complete the following steps to open a memory dump in the "Debugger Command" window provided by Debugging Tools for Windows:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.
2. In the left pane, click the name of the client system that contains the memory dump file that you want to open. The right pane lists all the files that Diagnostic Data Capture has saved for that client system.
3. In the right pane, right-click the name of the memory dump file that you want to open; then, click **Open**.

Diagnostic Data Capture opens the file in the "Debugger Command" window of the Debugging Tools for Windows. For information about using Debugging Tools for Windows or any of the prompts that it displays, see the documentation provided for it by Microsoft.

Analyzing a memory dump to create a memory dump report

Complete the following steps to analyze a memory dump and create a memory dump report:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. In the left pane, click the name of the client system that contains the memory dump file that you want to analyze. The right pane lists all the files that Diagnostic Data Capture has saved for that client system.

3. In the right pane, right-click the name of the memory dump file that you want to analyze; then, click **Analyze**. The "Analyze memory dump" window opens.
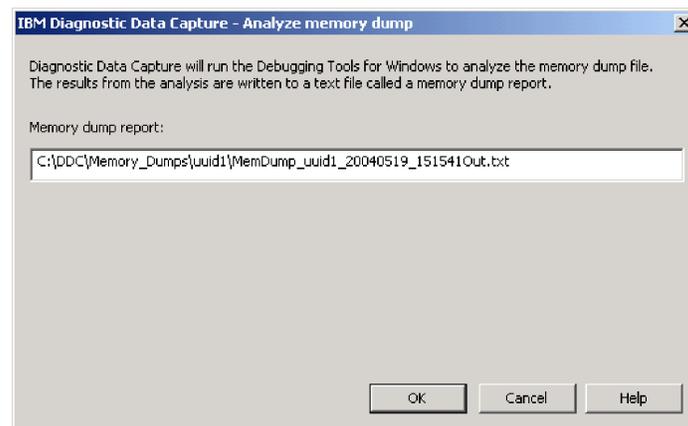
Figure 23. "Analyze memory dump" window

4. In the **Memory dump report** field, type the name that you want to use for the text report that is generated from the analysis of the memory dump. By default, the name of the memory dump file is used. Diagnostic Data Capture Server generates a text file that contains the memory dump report and displays its name in the "Diagnostic Data Capture" window.

5. Click **OK**.

Viewing a memory dump report created from analysis of a memory dump file

Complete the following steps to view a memory dump report from Diagnostic Data Capture Console:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.

2. In the left pane, click the name of the client system that contains the memory dump report that you want to view. The right pane lists all the files that Diagnostic Data Capture has saved for that client system.

3. In the right pane, right-click the name of the text file that contains the memory dump report that you want to view; then, click **Open**. Diagnostic Data Capture opens the selected text file in Microsoft Notepad.

Saving a file with a different name

Complete the following steps to save a memory dump file or memory dump report with a different name:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.
2. In the left pane, click the name of the client system that contains the file that you want to save with a different name. The right pane lists all the files that Diagnostic Data Capture has saved for that client system.
3. In the right pane, right-click the name of the file that you want to save with a different name; then, click **Save as**.

Deleting a file from the management server

Complete the following steps to delete a file from the management server:

1. Right-click the Diagnostic Data Capture system tray control; then, click **Start Diagnostic Data Capture Console**. The "Diagnostic Data Capture" window opens.
2. In the left pane, click the name of the client system that contains the file that you want to delete. The right pane lists all the files that Diagnostic Data Capture has saved for that client system.
3. In the right pane, right-click the name of the file that you want to delete; then, click **Delete**.

Examining event log files from client systems

Every time Diagnostic Data Capture collects a memory dump from a client system, it also collects the event log from the service processor on that client system. The event log file is saved to the management server in the same directory as its corresponding memory dump file. That is, the event log file is saved to the following directory:

d:*dump_directory**UUID*

where

- *d* is the drive letter of the hard disk drive where the memory dump files are written. By default, this is the system drive directory.
- *dump_directory* is the directory where the memory dump files are written. By default, this is \\DDC\\Memory_Dumps. For information about changing this directory, see "Configuring default settings for the management server" on page 21.
- *UUID* is the universal unique identifier (UUID) that is used to identify the service processor in the client system, for example, a4e9ea9c43b44a128ffe38c8bae8f9ff.

Diagnostic Data Capture names these event log files with the following naming convention:

FirmLog_*YYYYMMDD_HHMMSS*.log

where
- *YYYYMMDD* is the year, month, and date when the log file was created. For example, the date 20040507 means the file was created 7 May 2004.
- *HHMMSS* is the hour, minute, and second when the log file was created. For example, the time 145542 means that the file was created at 42 seconds past 2:55 p.m.

Figure 24 shows a portion of the event log from a client system.

```
System log cleared by user USERID.
Remote Login Successful. Login ID:''USERID' from CMD mode client at IP@=1.23.45.67'
Recovery System error log full
```

Figure 24. Sample event log from a client system

You can use any ASCII editors to view the event log file, although some, like Microsoft WordPad and Visual SlickEdit, handle the line returns and special characters in these event logs better than others like Microsoft Notepad.

The transferred event logs are the same event logs that you can view by using the Web interface to remotely access the service processor on a client system. For information about using this alternative method, see the *Remote Supervisor Adapter II: User's Guide*.

You can examine the messages in the event log to help solve any problems that you might be having while capturing memory dumps. For example, if a memory dump occurs for a client system and there is insufficient disk space available on the management server, Diagnostic Data Capture Client Driver logs a message to the event log. For information about disk space requirements, see "System requirements" on page 7.

Uncompressing memory dump files

Sometimes the management server does not have sufficient disk space for Diagnostic Data Capture to uncompress a memory dump file after it has been transferred from a client system. In this case, you must manually uncompress the file before you can manage it in Diagnostic Data Capture Console.

Note: Before you manually uncompress a memory dump file, you must free up sufficient disk space on the management server.

A compressed memory dump file is written to the same directory as the uncompressed memory dump files. The file naming convention is also the same except .gz is the file extension that is used for a compressed memory dump file. For more information on the dump directory and the file naming convention, see "Finding memory dumps collected from client systems" on page 25.

Use the **minigzip** command from a command prompt to manually uncompress a .gz file and create its corresponding .dmp file. This command has the following syntax:

minigzip -d *memory_dump_file_name*.dmp.gz

where
- *memory_dump_file_name* is the name of the file that contains the compressed memory dump that you want to uncompress.

After the memory dump has been uncompressed and is created with the .dmp extension, you can manage it using Diagnostic Data Capture Console.

Appendix A. Terminology summary and abbreviation list

This appendix provides a summary of Diagnostic Data Capture terminology and a list of abbreviations that are used in this documentation.

Diagnostic Data Capture terminology summary

The hardware in a Diagnostic Data Capture environment is referred to in the following ways:

- A *management server* is a server on which Diagnostic Data Capture Server is installed.
- A *client system* is a system on which Diagnostic Data Capture Client Driver is installed.

The following software concepts are applicable to Diagnostic Data Capture:

- *Diagnostic Data Capture Server* is the server-side component of Diagnostic Data Capture. When it is installed on a management server, it provides Diagnostic Data Capture Console and the listener service.
- *Diagnostic Data Capture Console* is the graphical user interface on the management server that provides configuration and management features for memory dumps gathered from client systems.
- The *listener service* is the feature of Diagnostic Data Capture Server that monitors client systems for memory dumps, saves the memory dumps to the management server, and notifies the management server that a new memory dump is available.
- The *system tray control* is the feature of Diagnostic Data Capture Server that provides management functionality for Diagnostic Data Capture in the Windows task bar.
- *Diagnostic Data Capture Client Driver* is the client-side component of Diagnostic Data Capture. When the client driver is installed on a server, it captures memory dumps that can be sent to Diagnostic Data Capture Server.

Abbreviation list

The following table lists abbreviations that are used in the Diagnostic Data Capture documentation.

Abbreviation	Definition
BIOS	basic input/output system
CSV	comma-separated value
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
GB	gigabyte
KB	kilobyte
HTML	hypertext markup language
IP	Internet protocol
PDF	Portable Document Format
UUID	universal unique identifier

Appendix B. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM® products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD or in the IntelliStation *Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/intellistation/.

You can find service information for your IBM products, including supported options, at http://www.ibm.com/pc/support/.

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Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, go to http://www.ibm.com/services/, or go to http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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Glossary

B

basic input/output system (BIOS). The personal computer code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard. The Configuration/Setup Utility program is a menu-driven utility that is part of the BIOS code that comes with a server. You can start it with F1 during a specific point in the server startup (by watching the screen for a message about it).

BIOS. See basic input/output system.

C

client system. The server on which Diagnostic Data Capture Client Driver is installed. The IP address of the service processor in a client system is configured in the Diagnostic Data Capture Console so that the management server can use the listener service to capture and analyze memory dumps from the client system.

D

Debugging Tools for Windows. Tools provided by Microsoft that can analyze memory dump files from systems running the Windows operating system.

Diagnostic Data Capture. The IBM stand-alone program that can capture, analyze, and manage memory dumps that are generated from operating system failures on supported xSeries systems. It includes two components: Diagnostic Data Capture Server and Diagnostic Data Capture Client Driver.

Diagnostic Data Capture Client Driver. The client driver component of Diagnostic Data Capture. When the client driver is installed on a server, it captures memory dumps that can be sent to Diagnostic Data Capture Server.

Diagnostic Data Capture Console. The graphical user interface on the Diagnostic Data Capture Server that provides configuration and management features for memory dumps gathered from client systems.

Diagnostic Data Capture Server. The management component of Diagnostic Data Capture. When it is installed on a server, it provides the Diagnostic Data Capture Console and the listener service.

L

listener service. The feature of Diagnostic Data Capture Server that monitors client systems for memory dumps, saves the memory dumps to the management server, and notifies the management server that a new memory dump is available.

M

management server. The server on which IBM Diagnostic Data Capture Server is installed.

memory dump. The means by which the computer system records its state at the time of a failure.

memory dump report. The text file created by Diagnostic Data Capture Console that contains the analysis of a memory dump. The information in this file is created by Microsoft Windows Debugging Tools.

N

notification icon. The icon that is displayed over the system tray control icon for Diagnostic Data Capture in the Windows task bar to indicate that a memory dump has occurred for one of the client systems configured in Diagnostic Data Capture Server.

port. An end point for communication between applications, generally referring to a logical connection. A port provides queues for sending and receiving data. Each port has a port number for identification. When the port number is combined with an IP address, it is called a socket address.

R

Remote Supervisor Adapter. An IBM service processor. It is built into the system board of some xSeries servers and is available as an optional adapter for use with others. When it is used as an ASM gateway, the Remote Supervisor Adapter can communicate with all service processors on the ASM interconnect.

S

service processor. A hardware-based management processor that is used in IBM Netfinity® and xSeries servers. A generic term for Remote Supervisor Adapters, Advanced System Management processors, Advanced System Management PCI adapters, and integrated system management processors.

symbol server. A server that provides access to Windows symbol files needed during memory dump analysis. Diagnostic Data Capture can use the Microsoft Symbols Server over the Internet or a site-specific symbol server.

system tray control. The feature of Diagnostic Data Capture Server that provides management functionality for Diagnostic Data Capture in the Windows task bar.

U

universal unique identifier (UUID). A 128-bit character string guaranteed to be globally unique and that is used to identify components under management. The UUID enables inventory-level functionality and event tracking of client systems.

UUID. See universal unique identifier.

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