StorageTek Library Attach for Window Servers

Installation and Operations

Version 1.4.3

Part Number: 316137901
May 2010, Revision AA

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StorageTek Library Attach for Windows Servers Installation and Operations Guide
Part Number: 316137901

Summary of Changes

EC released document table

EC	Date	Edition	Revision	Description
001630	May 2010	First	AA	In this release software enforcement of the right-to-use license is no longer employed in Library Attach and no longer checks for a valid license key

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Preface

Oracle's StorageTek Library Attach (LibAttach) for Windows Servers is a client application that enables Windows networks to use StorageTek's storage libraries. LibAttach provides the connection between Windows and StorageTek ACSLS, StorageTek Library Manager (using the StorageTek ACS adapter), or StorageTek Library Station, through a TCP/IP network.

Related Documentation

The following list contains the names and order numbers of publications that provide additional information about *the product.*

The online documentation is available at:

`http://docs.sun.com/app/docs/prod/`*`filename`*

The following books provide more information about this software product:

- *LibAttach Integrator's Pack* (available for LibAttach integrators only)

Documentation Website

Function	URL
Documentation	
Customer:	`http://docs.sun.com`
Employee:	`http://docs.sfbay.sun.com/`

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Book Title, part number

Product Overview

1

StorageTek LibAttach for Windows Servers is a client application that enables Windows networks to use StorageTek's storage libraries. LibAttach provides the connection between Windows and ACSLS, StorageTek Library Manager (using the StorageTek ACS adapter), or StorageTek Library Station, through a TCP/IP network.

LibAttach Benefits

LibAttach enables Windows networks to take advantage of the many mainframe-class storage solutions available with the StorageTek libraries. These storage solutions can provide the following benefits:

- Unattended network backups
- Centralized data storage and management
- Scaleability
- Data security and integrity
- Cost savings
- Firewall security

How LibAttach Works

LibAttach runs as a service on a Windows computer. Each Windows computer seeking connection to the StorageTek libraries must have a LibAttach license.

In order for a Windows application to communicate with LibAttach it must have been integrated with the Automated Cartridge System Application Programming Interface (ACSAPI). The ACSAPI is provided with the LibAttach Integrator's Pack, a separate product. See the *ACSAPI Programmer's Guide* for details.

LibAttach receives StorageTek library requests from Windows applications and translates them into Open Network Computing remote procedure call (ONC RPC) packets for transmission across the network to ACSLS or LibraryStation. ONC RPC is an industry-standard RPC implementation that can communicate with many versions of UNIX and Windows.

In turn, LibAttach receives acknowledgment and response messages from ACSLS and LibraryStation, and routes them to the appropriate Windows client application.

Installing LibAttach

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This chapter provides information and procedures for:

Preparing for the Installation

Before beginning the LibAttach installation, you should:

- Check with your system administrator to gather the following information: servers that should be shut down and window applications that should be running.
- Verify that your computer meets the following hardware and software requirements:

Hardware and Software	Requirements
Microprocessor	• Intel 32-bit x86 (or compatible) • Intel 64-bit ia64 (Itanium) • AMD 64-bit (Opteron or Athlon64) • Intel 64-bit EM64T
Operating Systems	• Windows 2000 Server/Advanced Server with service pack 4 • Windows Server 2003 with service pack 2 32-bit x86 • Windows Server 2003 with service pack 2 64-bit ia64 • Windows Server 2003 with service pack 2 64-bit AMD64 • Windows Server 2008 32-bit x86 • Windows Server 2008 64-bit ia64 • Windows Server 2008 64-bit AMD64
Memory (RAM)	Same requirements as operating system
Disk space	8 MB

Note: Installing and running LibAttach on workstation-class operating systems is not supported. If you install and then run Configurator on a workstation, you receive a warning that your computer does not meet the minimum software requirements.

- Obtain either the host name or the IP address of the ACSLS or LibraryStation server.
- Verify that all programs using the LibAttach services are halted if this is a reinstallation. This is to prevent conflicts when the setup program stops LibAttach services.
- You must remove any prior version of LibAttach before installing LibAttach 1.4.3.
- You can quit the installation at any time by clicking the Cancel button. To rerun the installation later, simply follow this procedure again from the beginning.

Installing LibAttach

1. Insert the Library Attach CD.

   Note: A window appears if the system detects you are running in a 64-Bit environment. In this case, you select which version of LibAttach you wish to install (32-bit or 64-bit). Check with your IT department to verify the version you need; choosing the incorrect version results in your media application being unable to communicate with the library server.

   The LibAttach installation CD contains installation packages for the three architectures supported by LibAttach.

   Processors which support x86 are nearly all Intel and Intel-compatible 32-bit processors (AMD and Cyrix). Processors which support ia64 are the Intel Itanium and Itanium2. Processors which support AMD64 are the AMD Athlon 64 family, AMD Opteron family, Intel Pentium 4 with EM64T, Intel Xeon with EM64T, and Intel Core 2 family.

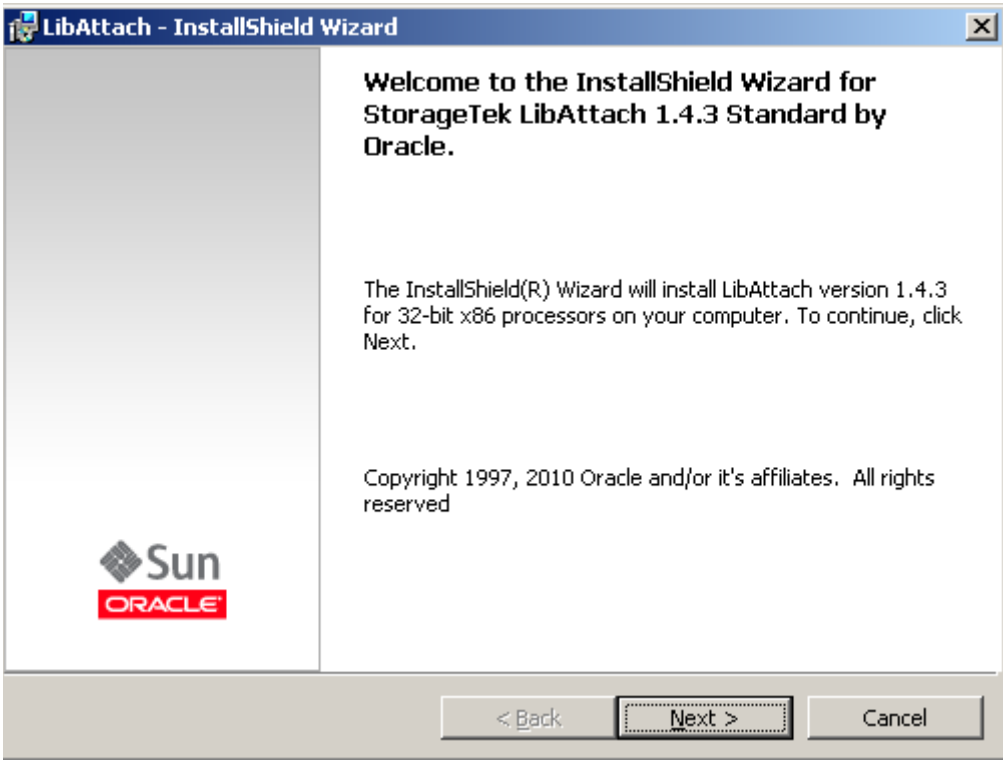
   The processors which can run 64-bit applications (either ia64 or AMD64) can also support running 32-bit x86 applications, either through emulation (on ia64) or natively (on AMD64).

   Depending upon your installation, you may be running 32-bit applications on a 64-bit architecture. In this case, you must install the 32-bit version of LibAttach. In other words, the "bitness" of LibAttach must match the "bitness" of your media application.

   After your selection the LibAttach 1.4.3 screen appears.

   The setup program prepares the InstallShield. The Welcome screen appears.

Figure 1. Welcome Window

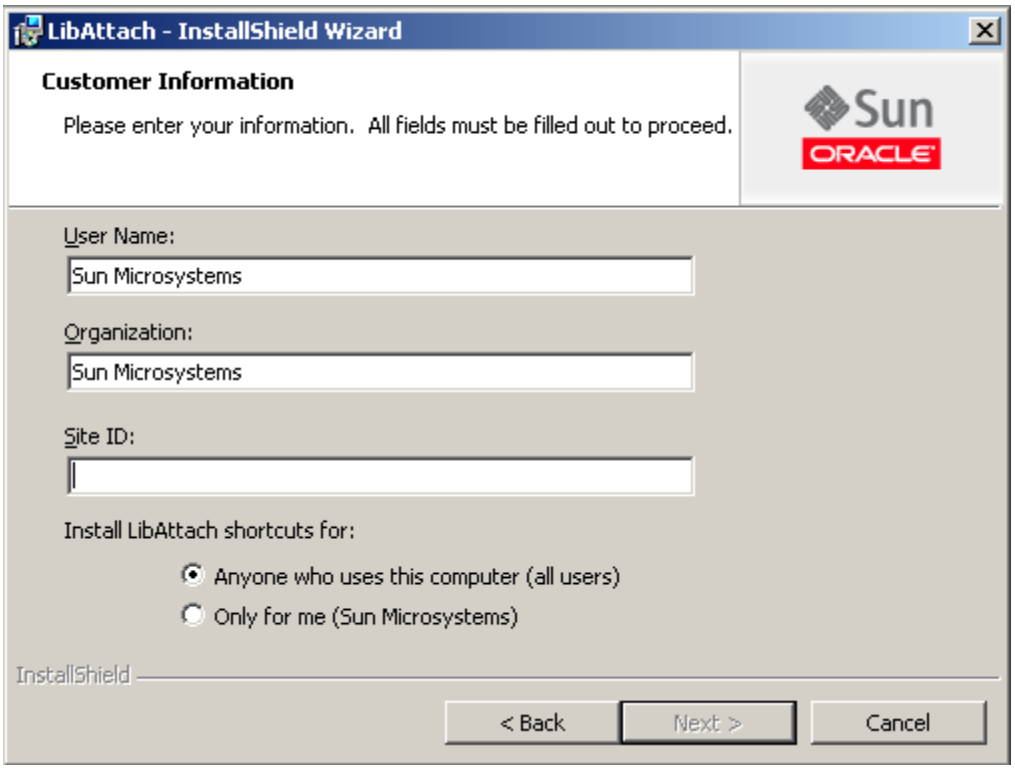


In this example, you are installing LibAttach on a 32-bit x86 processor. This window should match the processor on which you are installing.

2. Read the Welcome message and click `Next`

   A window similar to the following appears

Figure 2. Customer Information



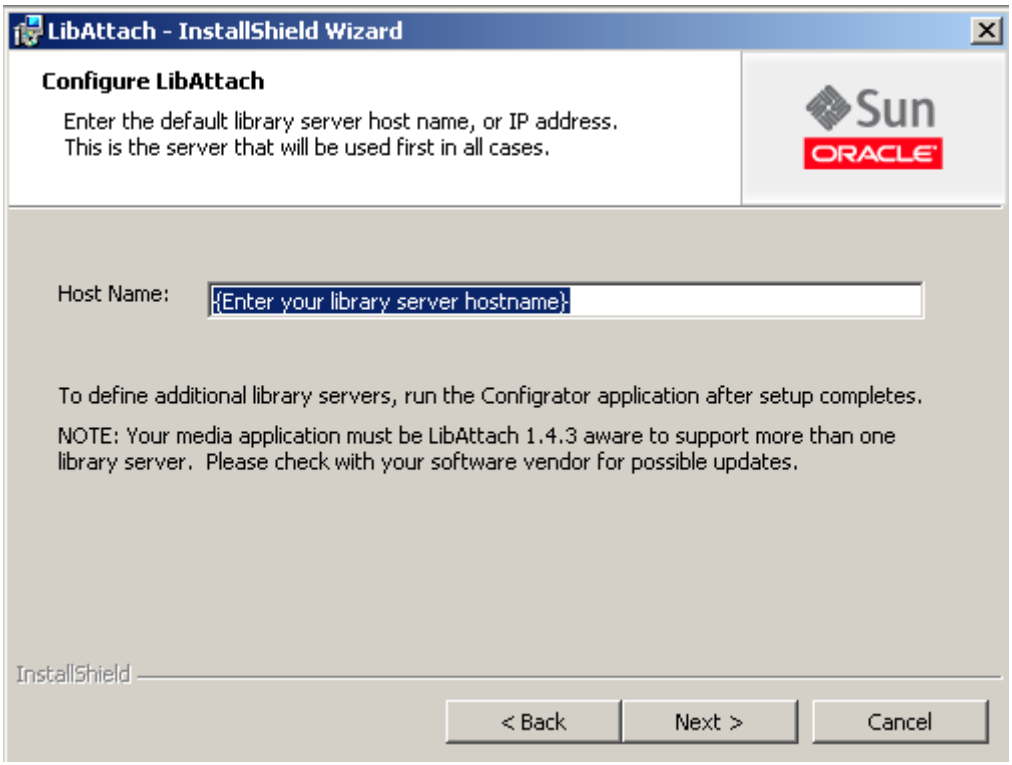
3. Enter your User Name, Organization, and Site ID.

   You must enter a site ID before continuing. If you do not have a Site ID, enter **9999** to proceed.

4. Select the type of shortcut.
5. Click `Next`.

   The following window appears.

Figure 3. Configure LibAttach

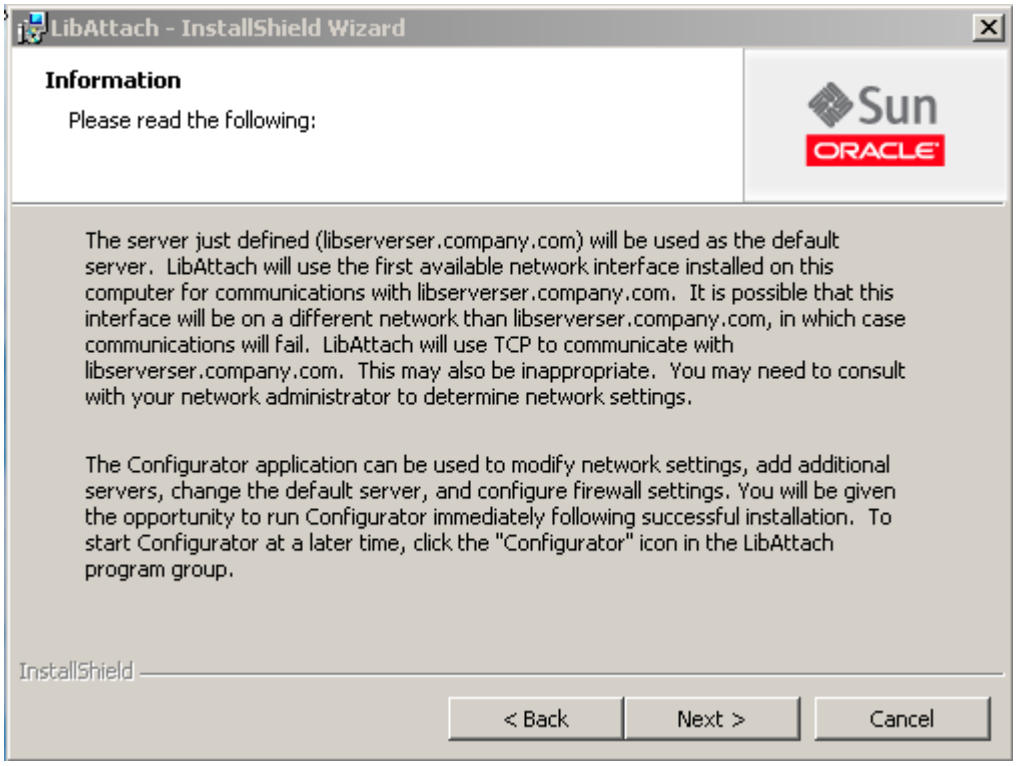


6. Enter the default library server host name or IP address.

   The Host Name contains the host name of the library server to which you want you client software to interface. This field can be either the name of the host or the IP address for the host. The name must match a valid machine on your network. The field is mandary, and may contain only one entry.

   After clicking `Next`, the following window appears.

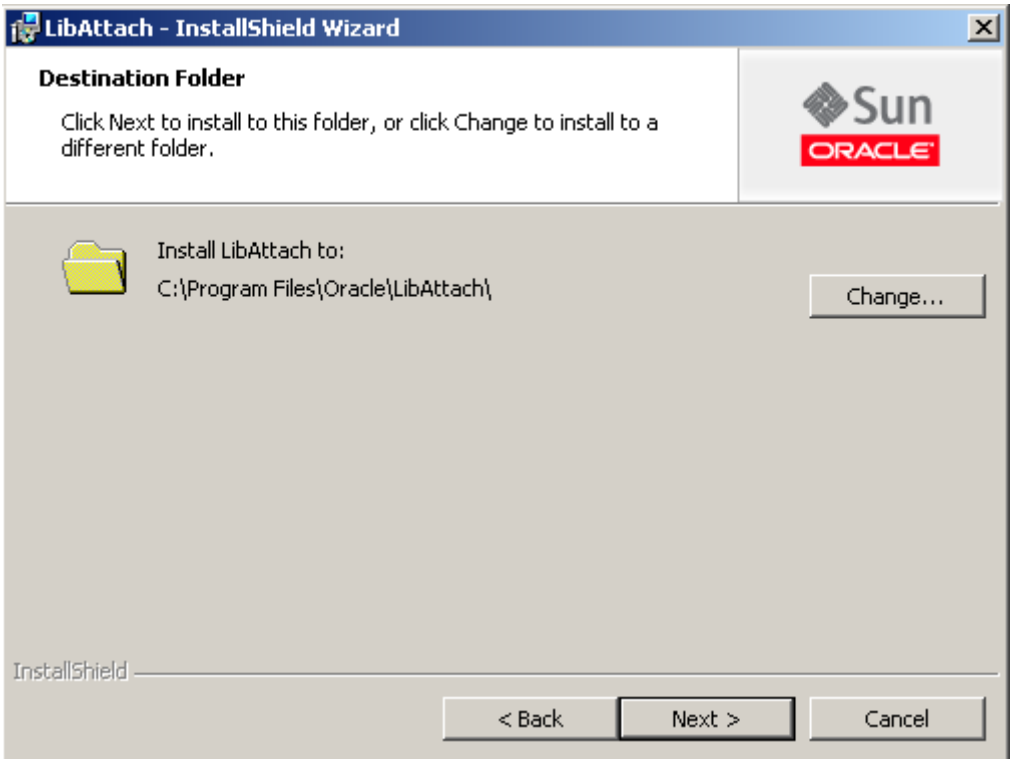
Figure 4. Server Information



7. Click `Next`.

   The following window appears.

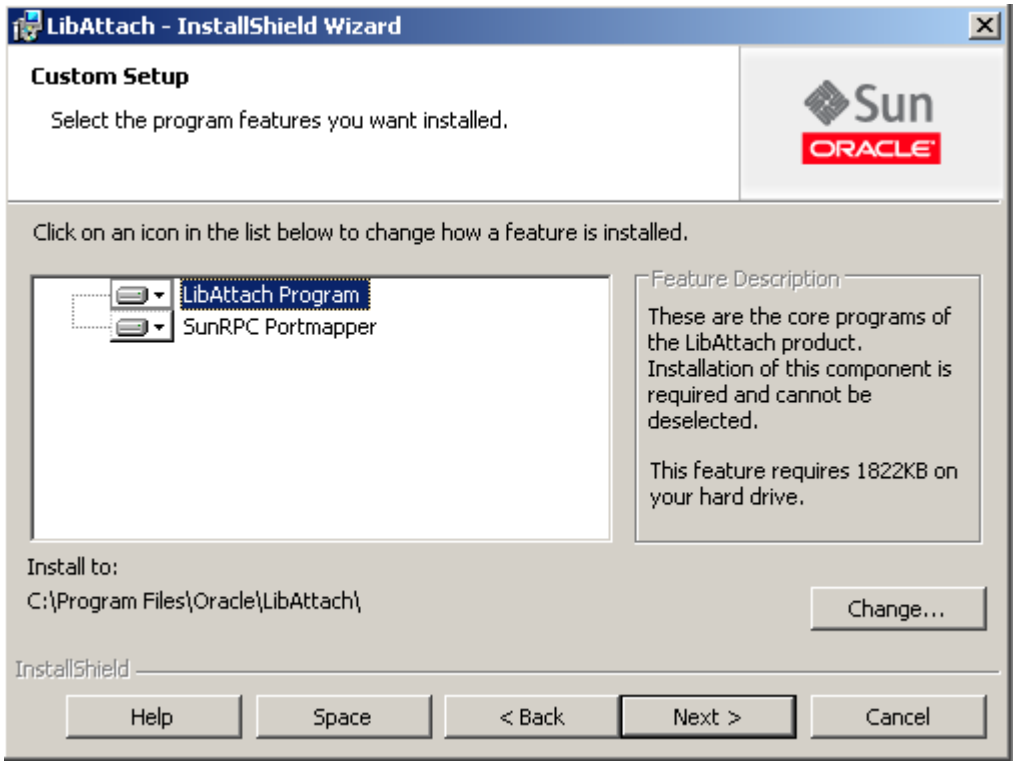
Figure 5. Choose Destination Location Window



8. Click `Next`.

   The following window appears.

Figure 6. Custom Setup



9. Select LibAttach Program and click `Next`.

   The LibAttach packages and the SunRPC Portmapper is installed.

   You can only have one portmapper running.

   Note: If you have a portmapper installed and want to use it for your connection, you must first:

   a. Click the down arrow next to SunRPC Portmapper.

   b. Select “This feature will be not be available” in the icon box.

      An X will appear in the icon box next to SunRPC Portmapper. The SunRPC Portmapper will be disabled.

   c. Select LibAttach Program.

   Note: Click `Help` to display the description for the icons for this screen.

   Click `Space` to change the disk space requirements.

   A Ready to Install window displays the settings you have entered and chosen in the preceeding windows.

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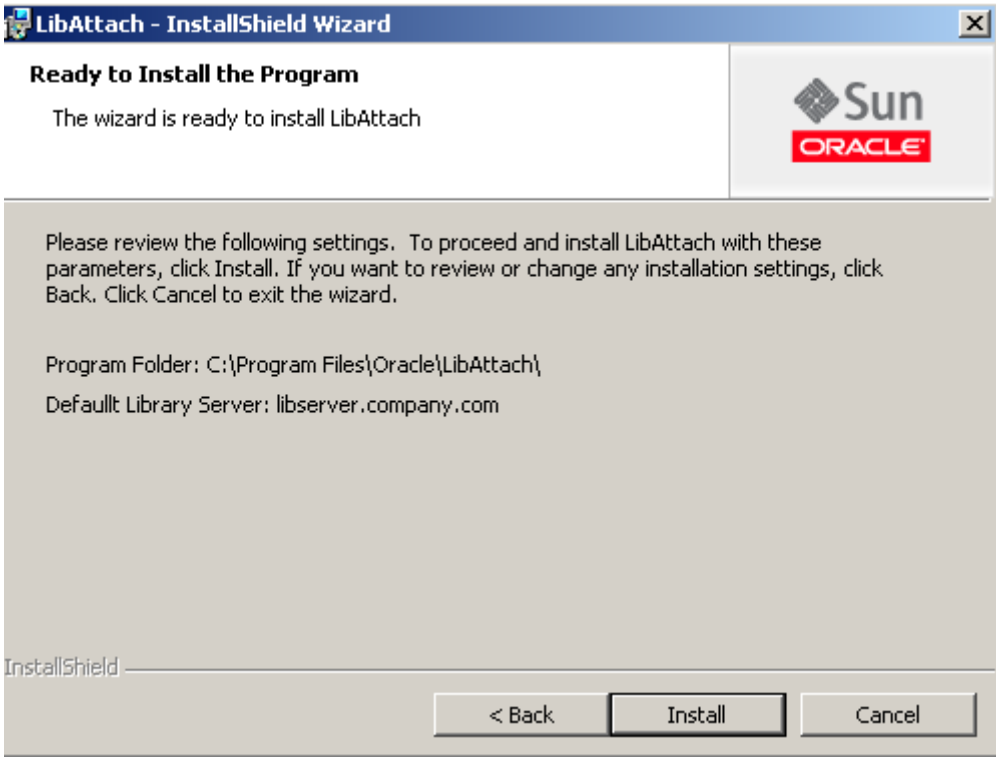
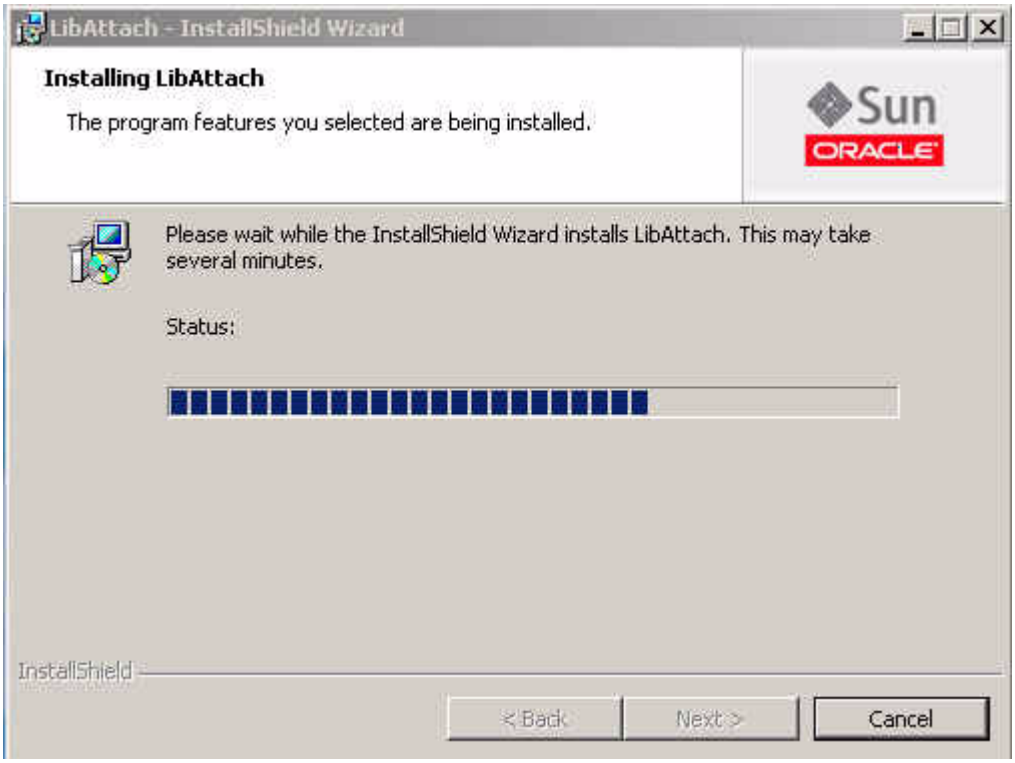
Figure 7. Ready to Install Window



10. Confirm that the entries are correct, then click `Install`.

    The following window appears.

Figure 8. Installation Status Bar



The installation program copies the program executable files to your computer. No action is necessary.

The following window appears.

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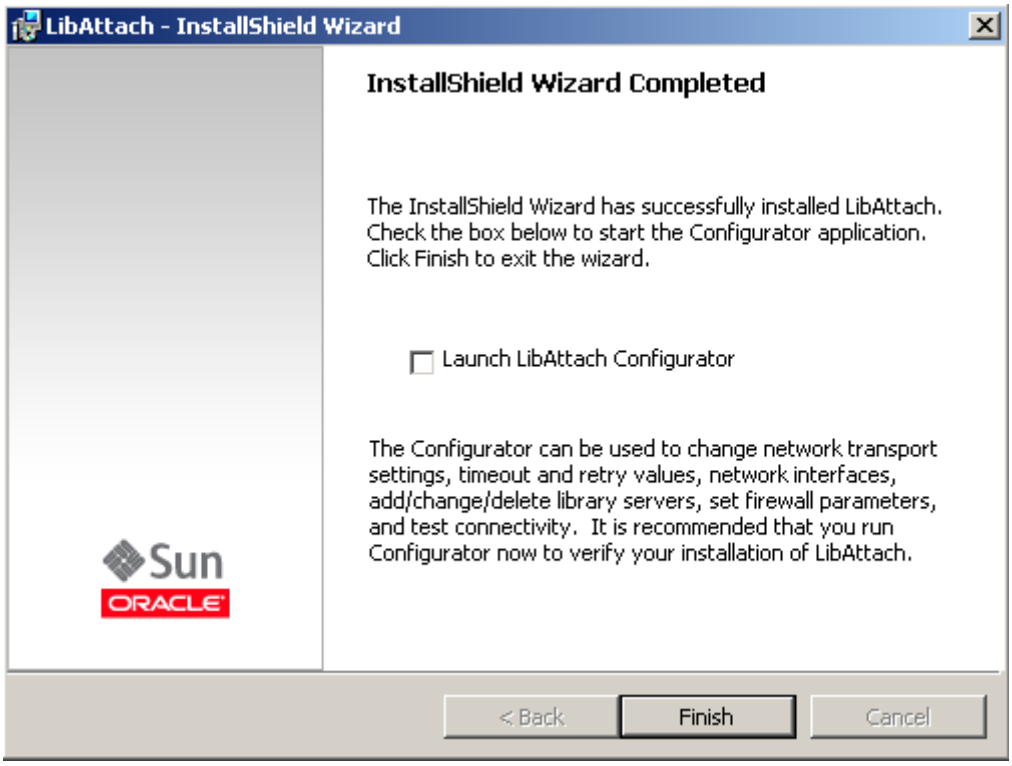
Figure 9. Installation Complete Window



Note: The installation is now complete, but it is highly recommended that you now launch the Configurator.

11. To do this click in the Launch LibAttach Configurator box and click Finish.

    Refer to "Using the Configurator" on page 17 for detailed information for setting up the Configurator.

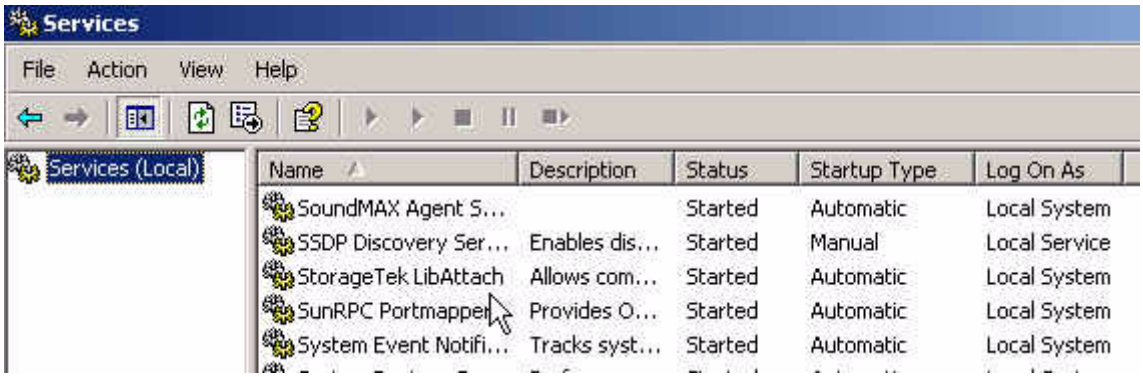
    Note: Click `Cancel` to abort the uninstall process.

Starting the LibAttach Service

During installation, the LibAttach service is configured to start up automatically when your computer is booted. There may be situations, however, where you need to start the service manually (for example, you have explicitly configured the service to start manually, or you have previously stopped the service manually). To do this:

1. Select `Control Panel -> Administrative Tools -> Services.`

   The Services window appearss.



2. Right click on LibAttach, then click Start.

   The service starts.

Uninstalling LibAttach

You may want to remove LibAttach if are no longer using it on your computer or if you want to change the directory where it is installed.

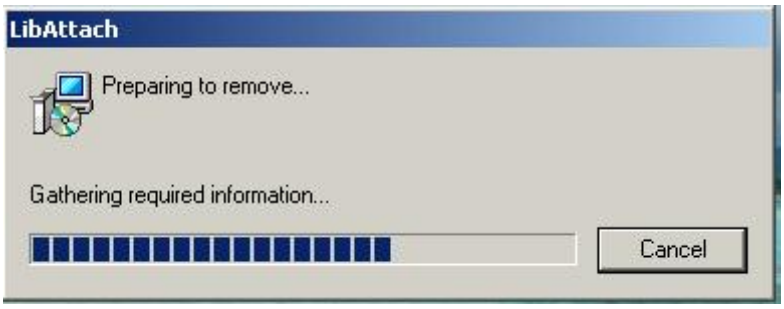
To do this:

1. Select Start -> All Programs -> Oracle -> LibAttach -> Uninstall LibAttach.

   The following window appears.

2. Click `Yes`.

   The following window appears.



Note: Click `Cancel` to abort the uninstall process.

Using the Configurator

3

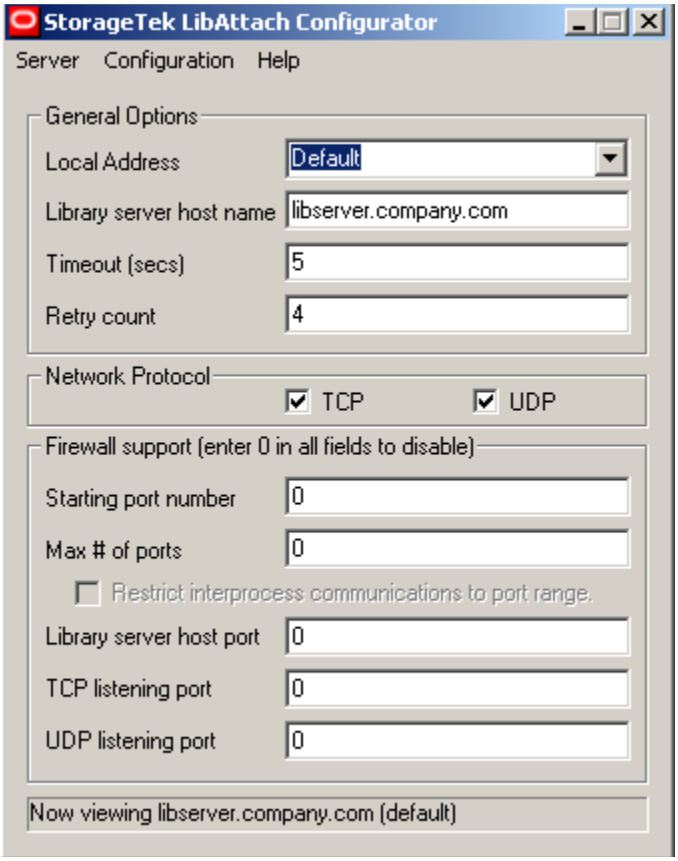
This chapter describes how to use the Configurator to set up your environment. Provided are procedures for:

Starting the Configurator

You can start or access the configuration in one of two ways:

- When you launch the Configurator during installation.
- By clicking `Start -> All Programs -> Oracle -> LibAttach Configurator`

The following window appears:



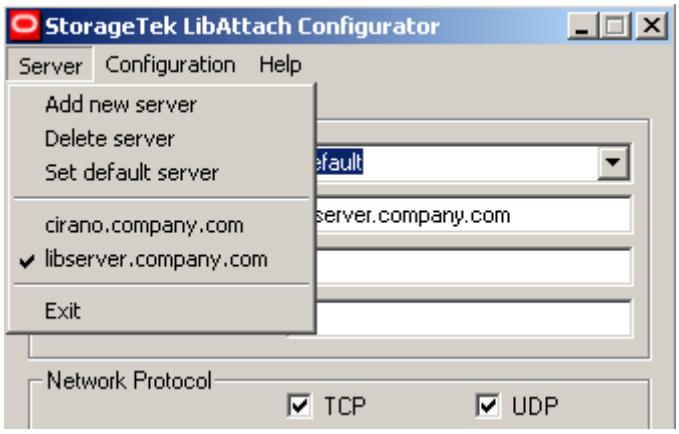
Using the Configurator Menus

The configurator is comprised of three drop down menus:

- Server
- Configuration
- Help

Using the Server Menu Options

The Server drop down menu provides the following selections:



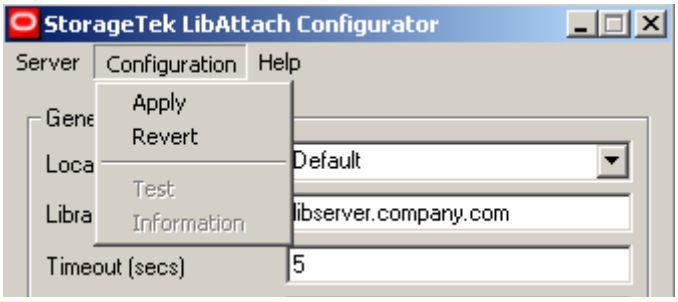
Select:

- `Server -> Add new server` - to add a new server
- `Server -> Delete a server` - to delete an existing server
- `Server - Set default server` - to set a default server from a list of available servers

Using the Configuration Menu Options

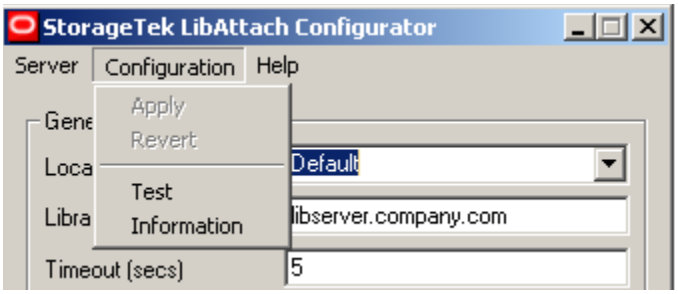
The Configuration Menu drop down menu provides the following selections:

- `Configuration -> Apply` - to save changed settings
- `Configuration -> Revert` - to return to the previous configuration settings. You cannot do this if you have already applied changes



- `Configuration -> Test` - to test connectivity to the server and configuration

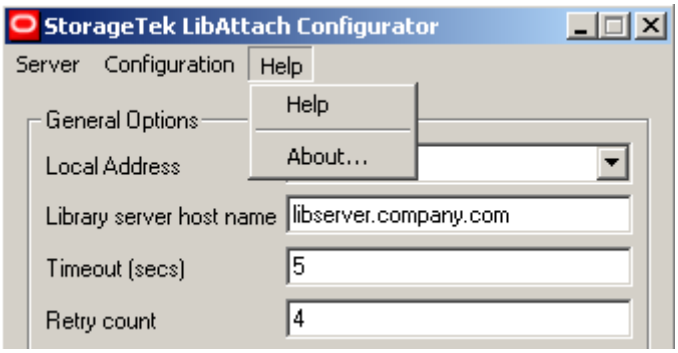
- `Configuration -> Information` - to view LibAttach process information



The items on this menu change with the operation being performed. When viewing servers (not making changes), the Test and Information items are enabled. If the currently viewed server is altered in any way, or if a new server is being added, then the Test and Information items are disabled, and Apply and Revert are enabled.

Help Menu Choices

The Help drop down menu provides the following selections:



Select:

- `Help -> Help` - to view and print help about the Configurator.
- `Help -> About` - to view a statement regarding trademark and the LibAttach version number

Setting General Options

The Configurator allows you to set up the following options:

- Local address
- Library server host name
- Timeout value

- Retry value

To set general options:

1. Click Start->All `Programs >Oracle >LibAttach > Configurator.`
2. Enter your local address information.

   This is a required field. Local address is a drop down menu, which is populated by a list of all addresses for all active network interfaces on the local server. You can select:

   - Default to allow Windows to select the address for you. If default is selected, LibAttach attempts to match the network interface for communications with the defined library server. The interface that is the default is determined by the order as established in the Windows network control panel applet. This field is mandatory, and may contain only one entry.

     The default local address is “Default”.

   - A specific address from the drop down menu for the service to use. The service then selects the appropriate network interface card (NIC) for the address. This allows you to specify which adapter to use to communicate with the ACSLS host.

   For servers that participate in multiple networks, this field is very important. An improperly selected address in this field can prevent all communications to your library server. You may need to consult with your network administrator for help.
3. Enter your Library Server Host Name.

   This contains the host name of the ACSLS (or other) host to which you wish to interface. The value of this field may be either the name of the host or the IP address for the host. If this field does not contain a valid address, LibAttach will attempt to find the IP address by doing a DNS lookup, or searching the hosts file on the machine on which it is installed. This field cannot be blank.
4. Enter the timeout value or accept the default.

   The time out value is the time, in seconds, LibAttach should wait for a response to a request it has sent to ACSLS, Library Manager, or a Library Station. If LibAttach does not receive a response within the specified time, it resends the request, until the Retry count has been reached.
5. Enter the retry value or accept the default.

   The Retry value is the number of times LibAttach attempts to resend a request before discarding it.

   The values of Timeout and Retry should be set in conjunction with each other. The default values are adequate for most sites; however, in the

situation of a remote ACSLS or LibStation server, or very slow or dirty network, these values may need to be adjusted. The messages may take the form:

```
csi_rconnect(): status: STATUS_NI_FAILURE; failed: connect()
Could not connect to remote host libserver.company.com:8020
```

The following should be taken into consideration when adjusting the values for Timeout and Retry:

- When changing values to timeout and retry values, make small adjustments to one parameter at a time in small increases.
- The product of timeout and retry should be kept as small as possible.
- You should try to make the values of timeout and retry approximately equal to those on the ACSLS server.
- You may need to increase retry and/or timeout values. If ACSLS is frequently unavailable, you may need to lower values of timeout and retry to prevent unnecessary retries.

6. Set up your network protocol.

Setting the Network Protocol

The Network Protocol check boxes specify the network transport that LibAttach is to use to send and receive requests and responses.

1. Choose at least one protocol.

   Which ever protocol you select, you must ensure the server is configured to send and receive requests using the same protocol. If you check both protocols, LibAttach uses TCP. If you select:

   - TCP - an acknowledgement is sent for each packet received. This increases reliability, but also increases network traffic.
   - UDP - an acknowledgement is not sent; packets are assumed to arrive correctly.

2. Set up firewall support.

Setting up Firewall Support

Check with you system administrator before setting up your firewall.

Overview

The Configurator allows you to set up firewall support by entering:

- Ports (starting port number and max number of ports)

Several singular ports, and a range of ports, must be opened on the firewall for communications between LibAttach and the Library Server. If you define more than one library server, each library server must have its own set of ports. There is currently no checking of static port settings among servers.

- Port ranges

  The range of ports must be opened on the firewall for communications between LibAttach and the Library Server. You may need to contact your network administrator for these values.

  The range of ports is required, because the interface between LibAttach and the library server is asynchronous. Each request to the library opens a new port, and each response back from the library server opens yet another port. Therefore, a typical transaction between LibAttach and the library server opens at least three ports. If the firewall also blocks return traffic, static ports may be defined for LibAttach to listen on for responses.

- Ports assigned in a pool

  There must be enough ports in the pool (defined as starting port plus max # of ports) to accommodate the level of activity for this server. As described above, a typical library server transaction consumes three ports. After a port has been consumed, it remains in a wait state for up to two minutes before becoming available again. The ports are consumed out of the pool in a circular manner, meaning least-recently used will be next used. This helps alleviate the problem, but on a very active server, it is possible that all the ports will be consumed, and all ports in the pool will end up in the wait state. When this happens, LibAttach will be unable to communicate with the library server. The symptom of this condition will appear as warning messages in the Windows event log. The messages take the form:

```
cl_ipc_xmit() [2263]: cannot bind to local static port 22022 (10048)
```

  Where: The number 2263 is the ID number of the running LibAttach process responsible for communications with a library server. This number is important for determining which server connection is having trouble.

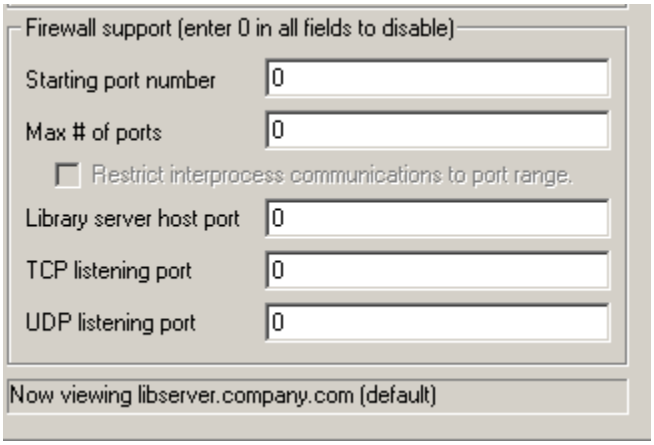
  The solution is to increase the number of ports in the pool. An alternative to increasing the number of ports is to decrease the wait state time in Microsoft Windows.

- Whether to restrict LibAttach to using only the pre-defined range of ports for its interprocess communications
- Library server host port
- If your firewall blocks return traffic from the library server, select:

- TCP listening port
- UDP listening port

Setting Firewall Support

To turn on the firewall-secure option, enter the following information.



1. Enter the starting port number

   This is the first port number opened on the firewall.

2. Enter the Max # of ports

   This is the number of ports that have been opened on the firewall. LibAttach uses ports from this pool in a circular manner.

3. Click to restrict interprocess communications to port range.

   CAUTION: You would only select this option of restricting IPC ports to a port range if your system uses TCP port filtering. If you are not using TCP port filtering, it is highly recommended that you do not enable this setting, as it may interfere with the operation of your client application.

   If you have enabled port filtering on this server, check this box to force LibAttach to use only the pre-defined range of ports for its interprocess communications. Then, you must open this range of ports in the Port filtering tab in the Network control panel. If in doubt, leave this box unchecked.

   if you have not entered a starting port and a max number of ports in the previous two fields, this box cannot be checked. Also, you many have to restart your media application for this setting to take effect.

4. Enter the Library Server Host Port

If the firewall blocks RPC (this is quite common), the library server must be set up with a static port for communications from clients. For example, in ACSLS this is called the CSI Host Port, and is configured on the server. Enter that port number here. When this value is specified, LibAttach will not attempt any communications using UDP port 111.

The following two fields are used if your firewall also blocks return traffic from the library server.

5. Enter the TCP Listening Port

   This is the port number on which LibAttach listens for TCP responses from the Library serve This port must also be opened in the firewall. If TPC is unchecked in Network protocol, this field has no meaning.

6. Enter the UDP Listening Port

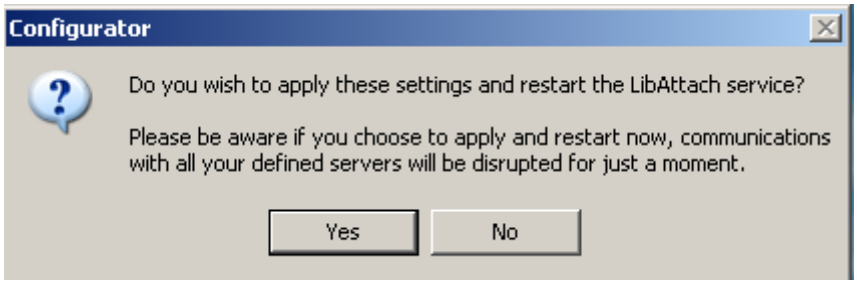
   Enter the number of ports to which LibAttach will listen for UDP responses from the Library server. This port must also be opened in the firewall. If UDP is unchecked in Network protocol, this field has no meaning.

   Note: With most firewalls, UDP is disabled across all ports, in which case the UDP check box in Network protocol should be unchecked, and this field should be “0”.

   To disable all firewall-related communication functions for the current library server, enter zeros in all the fields.

7. Click Configuration > Apply.

   The following message appers.



8. Click Yes.

Setting Up Multiple Library Servers

LibAttach 1.4.3 provides the ability to simultaneously connect to and communicate with more than a single library server. Applications must be LibAttach 1.4.3-aware to support multiple library servers. Please contact your application software vendor for more information.

This section discusses how to:

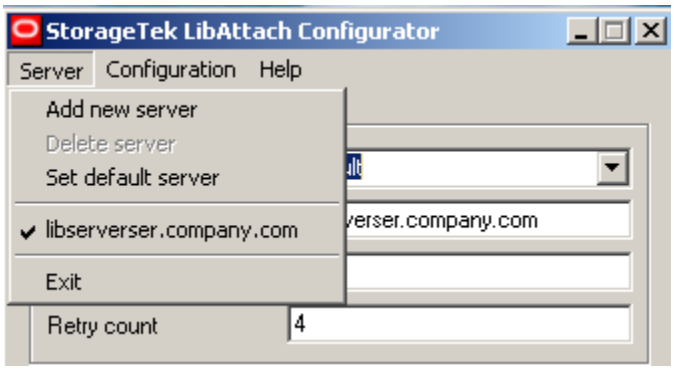
- Add a new library server
- Change an existing server
- Delete an existing server
- Set a new default server

Adding a New Server

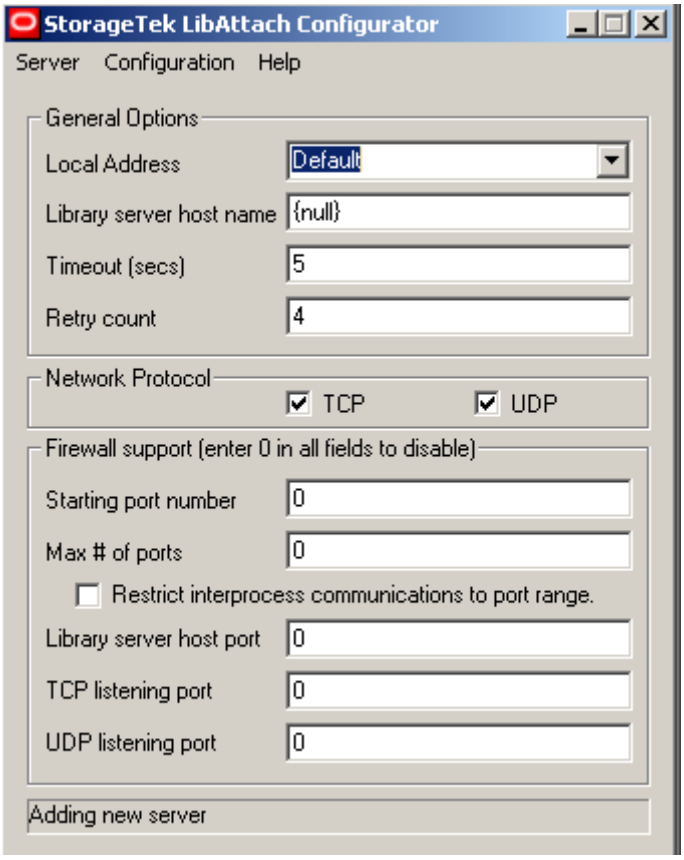
To add a new server:

1. Click `Server -> Add new server`.

Figure 10. Adding a new server



The following window appears.



2. Enter your information in the appropriate fields.
3. Click `Configuration -> Apply`.

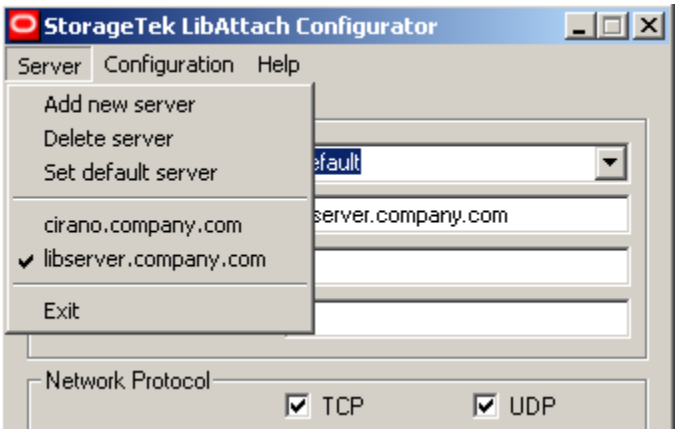
   You need to restart the LibAttach service. This is mildly disruptive and your client will lose connectivity to your defined library server(s) for a moment. Once the server has been successfully added, it will also be added to the Server menu. You may define up to a maximum of ten library servers. Once ten servers have been defined, the `Add new server` menu item is disabled.

   Note: Click `Configuration -> Revert` to cancel the operation.

Changing an Existing Server

To change an existing server:

1. Click `Server` and choose the server from the list of defined servers on the menu as shown in the following figure.



In this figure there are two servers currently defined, libserver.company.com and cirano.company.com. The check beside libserver.company.com indicates that this server is the one currently being viewed. If cirano.company.com were selected for viewing, the check mark would move to that server.

2. Make any desired changes and click `Configuration -> Apply`.

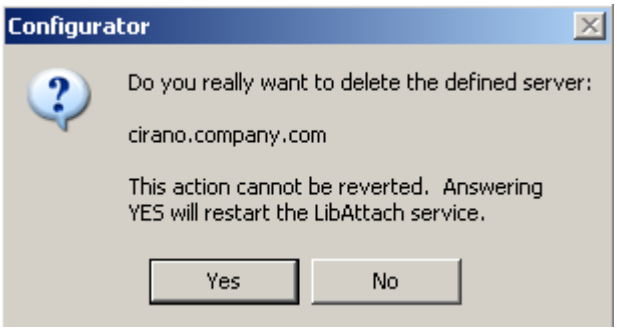
Note: Click `Configuration -> Revert` to undo all changes to this server. You can also abandon the changes by selecting a different server, or by exiting the program.

Deleting an Existing Server

To delete an existing server from a list of available servers:

1. Click `Server` and from the list of servers, select the server to be deleted.
1. Click `Server -> Delete server` at the delete window.

   The following window appears.



2. Click Yes to delele.

   Note: The deletion cannot be undone, and you cannot delete the default server. If only the default server is defined, the Delete server menu item is disabled.

Setting a New Default Server

The initial default server is defined when you installed LibAttach. The default server is the server that is used by applications that are not LibAttach 1.4.3 aware (they do not specify a server when issuing library commands).

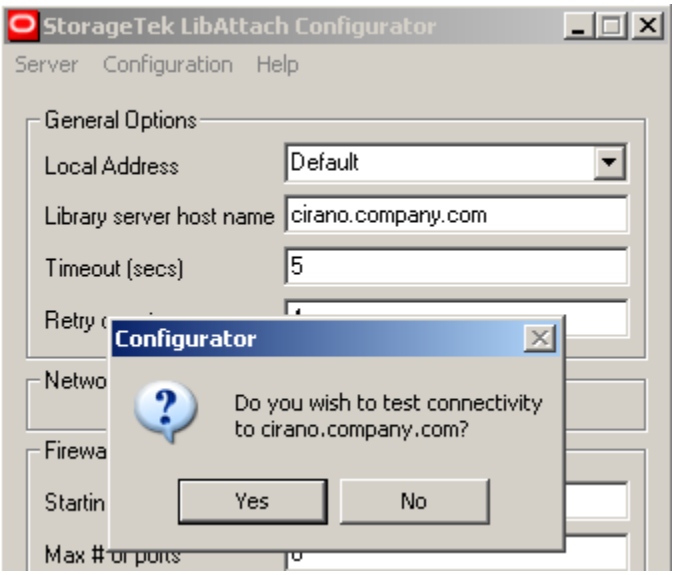
To select a different server as the default:

1. Click `Server` and from the list of servers, select the server you want as the default.
2. After selecting the server, Click `Server -> Set default server.`

Testing Server Settings

After changes have been applied and the LibAttach server has been restarted you have the option of validating your settings and connectivity. To do this:

1. Click `Configuration -> Test.`



2. If the test is successful, a confirmation message appears with the number of free cells and tape drives.

   If not, you receive a failed message.

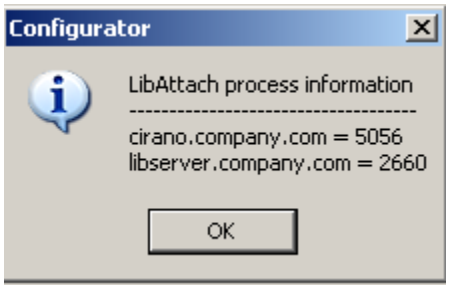
Viewing Library Server Processes

Each defined library server has its own dedicated LibAttach process. The maximum number of library servers that may be defined is ten, so the maximum number of LibAttachs processed is also ten. Each process consumes about 2.5 MB of memory and is assigned a process ID by Windows. If problems arise with a library server, you see messages in the Windows event log, and/or the LibAttach event logger, and its process ID.

To view a library process:

1. Click `Configuration -> Information.`

   The following window appears.



In this example, two library servers have been defined, with process IDs of 5056 and 2660. If you were receiving messages that alerted you to trouble from process 2660, you would know that LibAttach is having difficulties communicating with the server *libserverser.company.com*. You could then take appropriate corrective action.

Process IDs change with each restart of the LibAttach service.

Using the Event Logger

4

The event logger is used to monitor communications between LibAttach and the library server (ACSLS, Library Station, or Library Manager) to which it is connected

This chapter provides information on:

Getting Started

This section describes:

- What you need to do to set up your event logging as discussed on page 33.
- Using the event logger as discussed on page 33.
- Using the event logger menu options as discussed on pages 35 and 35.

Setting up your event log

The first time you set up the event logger, you need to perform the following steps:

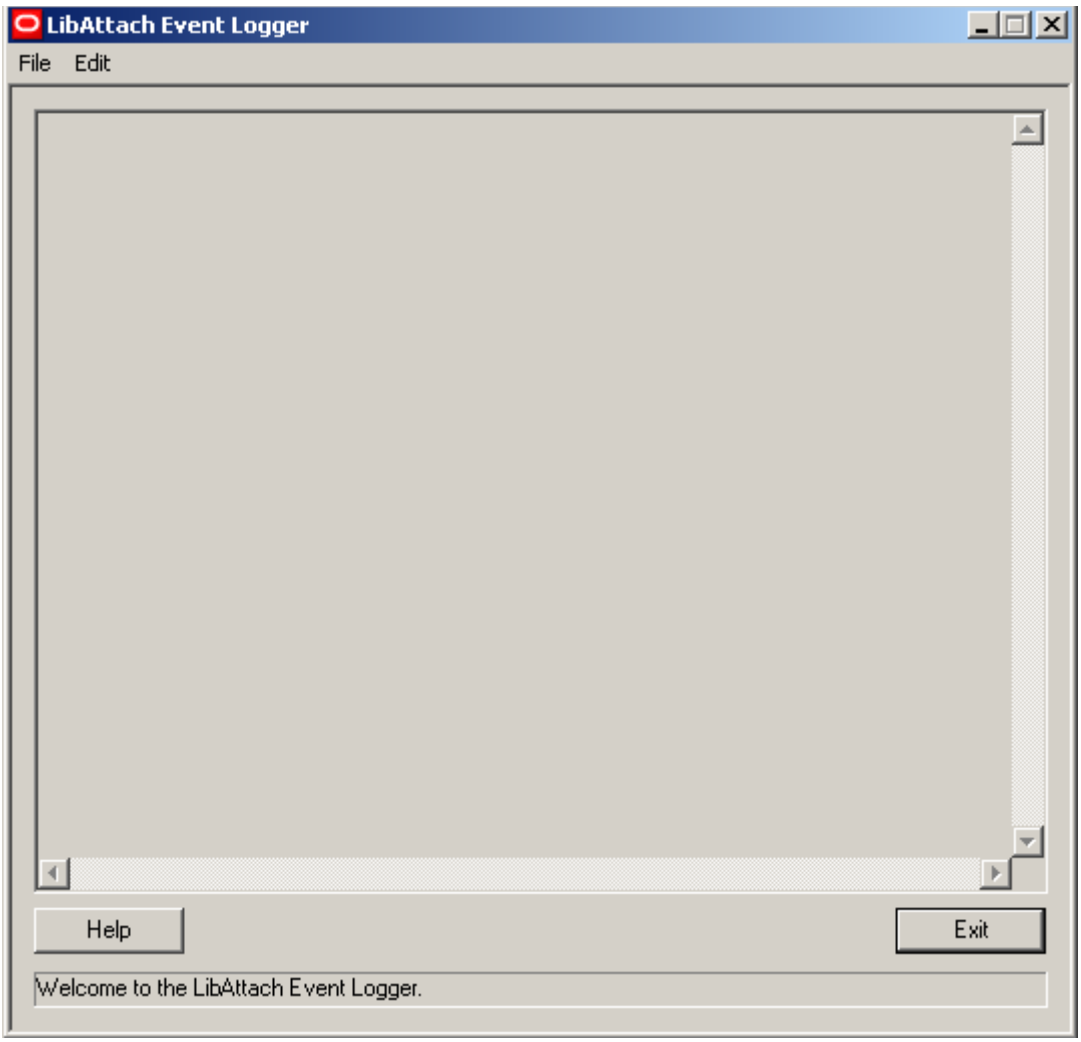
1. Start the event logger as discussed on page 33.
2. Start tracing as discussed on page 38.
3. Start the decoding of trace files as discussed on page 40.

Using the Event Logger

To start the LibAttach event logger:

1. Click Start->`All Programs->Oracle->LibAttach->Event Logger`.

   The main Event Logger window appears.



The large empty block in the center is called the progress window, and this is where events appear.

- The `Help` button generates on-line help.
- The `Exit` button quits the program.

  You can also click `File -> Exit`.
- The status bar appears below the `Help` and `Exit` buttons.

Using the Logger Menus

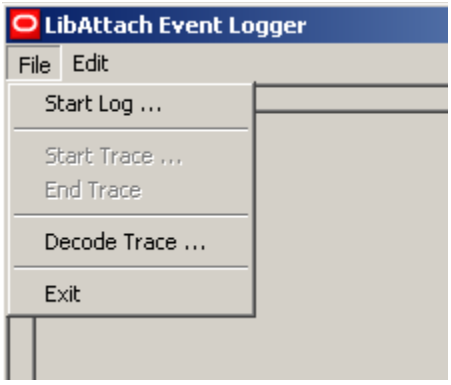
The event logger is an exception logger, which means that only errors and other program anomalies will generate events.

The event logger is comprised of two drop down menus:

- File menu
- Edit menu

Using the File Menu Option

The File drop down menu provides the following selections:



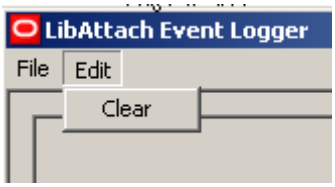
- `File -> Start Log...` starts event logging.
- `File -> Start Trace ...` starts monitoring.

  Tracing monitors not only event logging, but captures every packet of information sent across the network to the library server. Using this function greatly aids in your diagnostic efforts.
- `File -> End Trace ...` stops monitoring.
- `File -> Decode Trace ...`translates the trace format from binary format to a readable format, such as a text file.
- `File -> Exit` stops event logging.

  You can also do this by clicking the `Exit` button above the status bar.

Using the Edit Menu Option

The Edit drop down box provides the following selection:



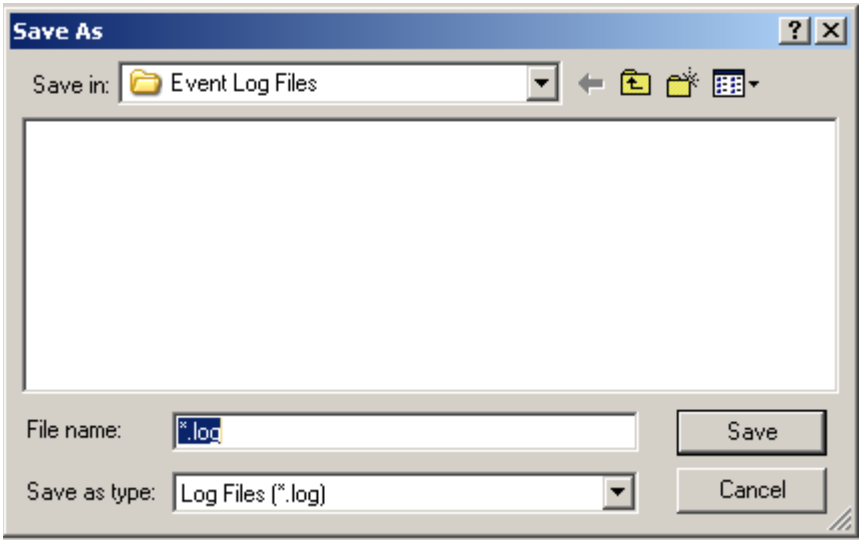
Selecting `Edit -> Clear ...` clears the display.

Event Logging

When you first start up the Event Logger, it is idle. To begin logging events:

1. Click `File -> Start Log ...`

   The following window appears.



2. Enter a file name for the log file in the File name field.

   This log may be stored on any valid local or network file system.

   - If you choose a file that already exists, new events will be appended to this existing file.
   - If you do not want to append to the existing file:

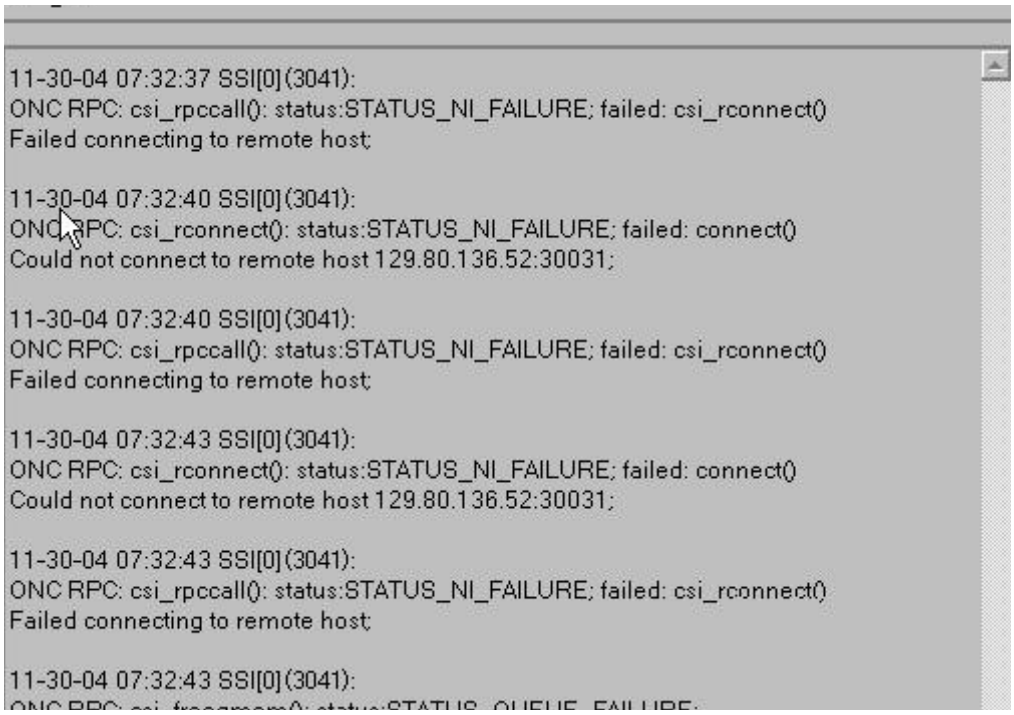
     a. You must right-click the existing file and choose `Delete`.

     b. After the file has been deleted, click `Save`.

   The status bar of the Event Logger window shows that logging has begun to the file you've just chosen.

Once event logging had begun, the progress window remains empty until an event occurs. Remember, that the event logger is an exception logger and only errors and other program anomalies will generate events.

The events appear in the progress window as shown in the following figure:



Note: The progress window can be cleared by clicking `Edit -> Clear`.

The construction of the message provides the following information:

- The first line contains:
  - The date and time the message was generated.
  - The source of the message (always SSI).
  - The process ID that generated the message.
- Each running LibAttach process responsible for communications with a library server is assigned a unique process ID by Windows. You can relate a process ID to a running LibAttach service, and a configured library server by using the Configurator. In this example the process ID is 3041.
- The next line contains the:
  - Protocol (always ONC RPC)
  - Internal function where the fault occurred.

- Status generated by the fault.
- Additional information further detailing the fault.

Note: Remember, a properly functioning LibAttach installation will not generate any errors.

Stopping the Event Logging

To stop logging, exit the program by either clicking the `Exit` button, or clicking `File -> Exit`.

Tracing

Tracing monitors not only event logging, but captures every packet of information sent across the network to the library server. Using this function greatly aids in your diagnostic efforts.

- Servers

  When you start tracing, all servers that have been defined begin tracing. If the server(s) is busy there will be a vast amount of trace information. You can see which server is generating trace information by identifying the process ID located on the first line of each trace message. You can then relate a process ID to a running LibAttach service, and to a configured library server by running the Configurator.

- API Trace - LibAttach and a client application

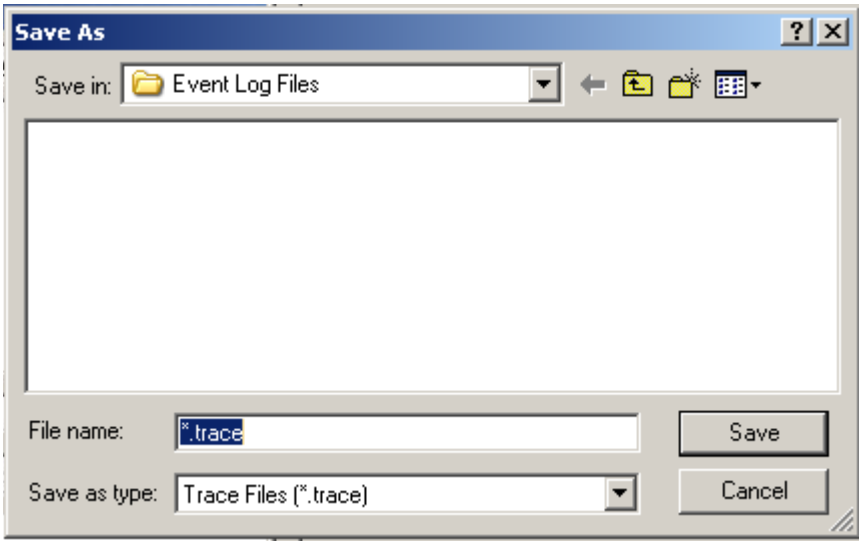
  LibAttach also includes the ability to trace transactions between itself and a client application. Whenever tracing is active, all client application accesses are logged to the file you choose when you started tracing. This file is approximately 1/6th the size of the regular trace file. This file can help diagnose disconnects and other difficulties between LibAttach and a client application. API requests can be generated by any number of client applications, but only one trace file can be created. This file is a plain text file which means no decoding is necessary.

Starting Tracing

To start tracing using the Event Logger:

1. Click `File -> Start Trace …`

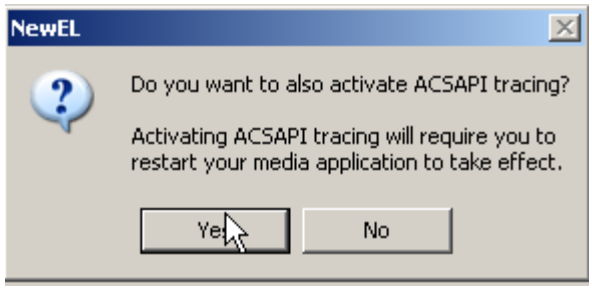
   The following window appears.



2. Enter a file name for the trace file in the File name field and click `Save`.

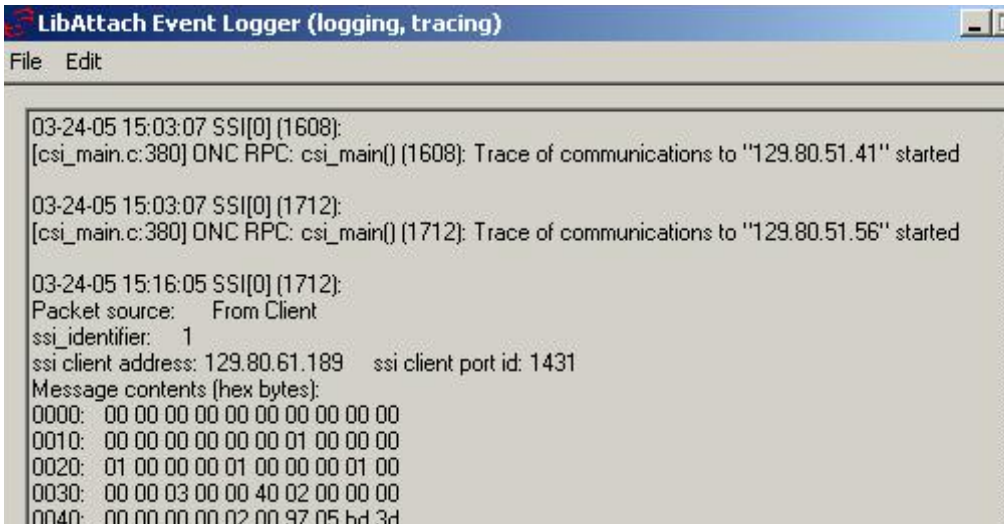
   This file can be stored on any valid local or network file system. If you choose a file that already exists, new trace information is appended to the existing file. The status bar of the window shows that tracing has begun to the file you chose. The trace log contains more information than the event log.

   The following message appears:



3. Make your selection.

   Trace log information appears in a window similar to the following:



Stopping Tracing

Tracing can be stopped at any time by clicking `File -> End Trace`.

■ Decoding Trace Files

The trace files are binary in format. To translate them into readable form:

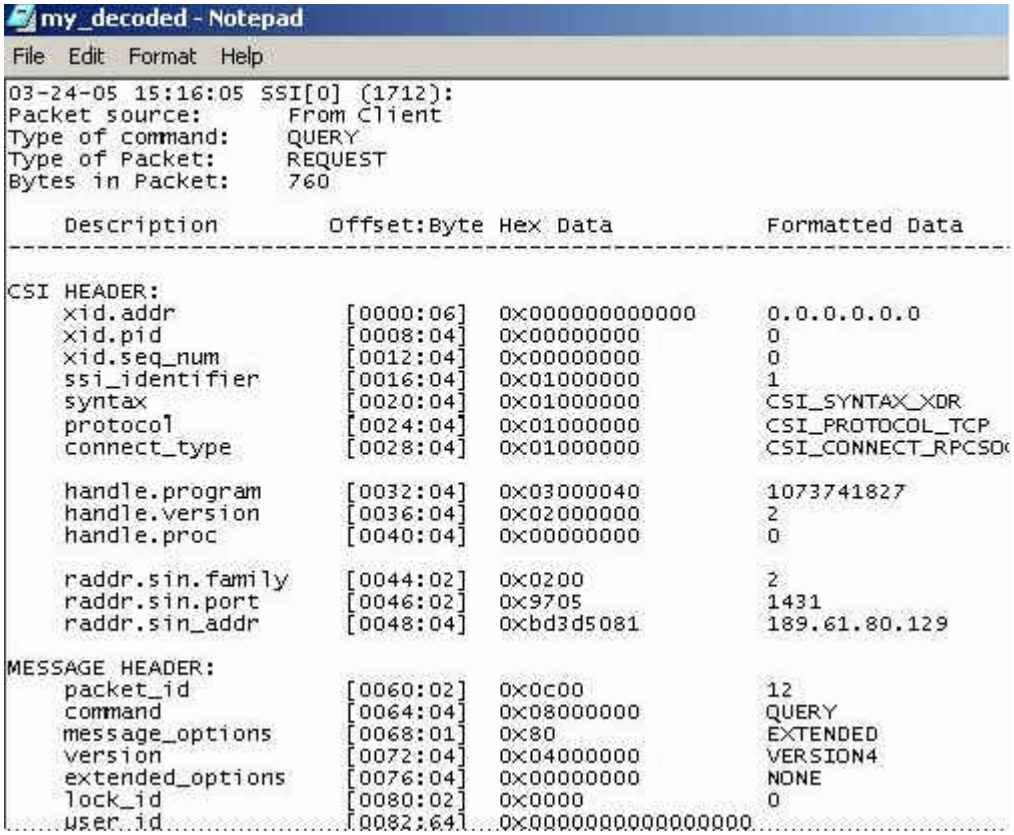
1. Click `File -> Decode Trace …`
2. Select the trace file (that was previously created) to be decoded.
3. Choose a text file name to contain the decoded trace information.

   The decode process begins immediately as shown in the following figure.

   You can cancel decoding at any time by clicking `Cancel`.
4. Click `OK` to view the decoded message in the trace.

   When done, the decoded trace will be shown in the Windows notepad, as shown in the following figure. In this example the process ID is 1712.

   Note: Very large trace decodes cannot be viewed in notepad, and must be viewed with another text editor, such as Microsoft Word



In this example the process ID is 1712.

Note: You can use the Configurator application to relate a process ID to a running LibAttach service and to a configured library server.

Deleting an Existing File Name

You can choose to delete an existing log or trace file name by performing the following steps:

1. Access your log file or trace file.
2. Right-click the file name.
3. Select Delete.
4. Click `Yes` at the confirmation message.

Registry Updates

A

This appendix describes the changes to the Windows Registry made by LibAttach.

Subkey Location

The Registry entries used and updated by LibAttach are found in the `HKEY_LOCAL_MACHINE\Software\Oracle`. Each defined server then creates a subkey.

How the Registry is Updated

The keys and value entries are created and set during LibAttach installation, specifically by the data you enter in the Configure LibAttach screen.

To change most of the value entries you can either rerun the installation (the preferred method) or use the Registry editor, REGEDT32.

Configurator Screen

The following table shows which Registry value entries are set by which parameters on the Configurator LibAttach screen.

Registry Value Entry	Screen Parameter
`CSI_CONNECT_AGETIME`	N/A — does not appear on screen
`CSI_HOSTNAME`	ACSLS or LibraryStation host name
`CSI_RETRY_TIMEOUT`	Timeout
`CSI_RETRY_TRIES`	Retry count
`CSI_TCP_RPCSERVICE`	RPC Protocols: TCP/IP
`CSI_UDP_RPCSERVICE`	RPC Protocols: UDP
`RestartCount`	N/A — does not appear on screen
`SocketName`	N/A — does not appear on screen
`TraceValue`	N/A — does not appear on screen
`Type`	N/A — does not appear on screen
`FixedPortForTCP`	TCP listening port

Registry Value Entry	Screen Parameter
FixedPortFor UDP	UDP listening port
FixedPortsCurrent	N/A
FixedPortsMAX	Max number of ports
FixedPortsStart	Starting port

Note: A 0 (zero) value indicates previous behavior or that firewall configuration is off.

The Registry values not found on the Configurator LibAttach window are described below. Normally, these values should be left at their defaults and not changed through the Registry editor.

Connect age time

When LibAttach receives a request from an application, it strips the IPC header from the request and stores it in a queue before attaching a new IPC header and forwarding the request.

This parameter specifies how many seconds LibAttach should keep the IPC header in its queue waiting for a response from ACSLS or LibraryStation before discarding the header.

Use the following guidelines when setting this parameter:

- LibAttach's Connect age time value must be greater than the product of the timeout and retry count values set for the ACSLS or LibraryStation server. Likewise, the connect age time value for ACSLS or LibraryStation must be greater than the product of the Timeout and Retry count values set for LibAttach.
- The Connect age time value should not be set higher than necessary. Increasing the value of this field unnecessarily delays the ability of LibAttach to detect network or ACSLS/LibraryStation server failures.

Restart count

The number of times spawned processes are restarted if they are abnormally terminated.

This parameter is not used by LibAttach.

Socket name

The socket on which LibAttach listens for requests from applications. An application must send requests to this socket in order for LibAttach to receive them.

Normally this value should be left at the default.

Trace value

This value is set by the toggle_trace command. “0” indicates that packet tracing is turned off; “1” indicates that tracing is turned on. See “Using the Event Logger” on page 33 for detailed information.

Type

The LibAttach component ID. This value is used in the IPC packet to identify LibAttach as the originator of a request. This information is used by ACSLS and LibraryStation.

CAUTION: This value should never be changed from the default.

Troubleshooting

B

If you encounter a problem with the LibAttach software, you can take several simple steps to help isolate and possibly solve the problem yourself. This chapter details these steps. We recommend you work through the steps in this chapter before calling software support.

Even if you cannot solve the problem yourself, these steps will help you gather the information software support needs to address the problem most efficiently.

ACS Not Responding to Submitted Commands

If you are unable to submit commands to an ACSLS host, follow the steps below.

1. Determine the network configuration. To do this, identify and write down the following host names:
   - The LibAttach server
   - The ACS server (the server on which the ACSLS, StorageTek Library Manager, or Library Station software is installed)
   - The host to which the tape drive is connected
2. On the LibAttach server, bring up the Services window and verify that the StorageTek LibAttach and SunRPC Portmapper services are running.

   If either service is not running you need to start it before proceeding.
3. Verify that the LibAttach server can communicate with the ACSLS or LibraryStation server. To do this, issue the following command from a Command Prompt or MS-DOS console window on the LibAttach server:

   ```
   ping acs_host
   ```

   where *acs_host* is the ACSLS or LibraryStation host name you identified in Step 1.

   If the server does not respond, you need to establish the network connection before proceeding.
4. Display network interface parameters for the LibAttach server, including the IP and MAC addresses. To do this, issue the following command from a Command Prompt or MS-DOS console window on the LibAttach server:

   ```
   ipconfig /all
   ```

If any of the parameters are incorrect, you need correct them before proceeding.

5. Display message routing information for messages travelling between the LibAttach and ACS servers. To do this, issue the following command from a Command Prompt or MS-DOS console window on the LibAttach server:

   ```
   tracert acs_host
   ```

   where *acs_host* is the ACSLS or LibraryStation host name you identified in Step 1.

   If you notice any problems, you need to correct them before proceeding.

6. Check the Windows event log for LibAttach messages. To do this, double-click the “Event Viewer” in the “Administrative Tools” group.

   Upon successful start-up, LibAttach makes at least three entries in the event log:

   1. `svc_main` – LibAttach service initialized
   2. `svc_main` – LibAttach ready
   3. `csi_main` – SSI ready (one per defined server)

   The SunRPC Portmapper also writes one entry to the log on a successful start-up:

   ```
   The service was started.
   ```

CAUTION: All of these entries should be preceded by the blue circle -I “Information” icon. If you find any LibAttach messages with yellow “warning” or red “failure” icons, a serious error occurred within LibAttach. Contact StorageTek software support.

Hint: Refer to your Windows documentation for help using the Windows Event Viewer.

Glossary

A

ACS — See automated cartridge system**.**

ACS event logger (ACSEL) — The software component that receives messages from other ACSLS components and writes them to an event log.

ACS library manager (ACSLM) — The software component that validates and routes library requests and responses.

ACS library software (ACSLS) — Manages ACS library contents and controls ACS library hardware to mount and dismount cartridges on ACS cartridge drives.

address — In a data communications network, the symbolic identifier used to route messages to a terminal or node. An address depends on the types of telecommunications or networking protocols being used.

automated cartridge system (ACS) — The library subsystem consisting of one LMU, and one to 24 Lessens connected to that LMU.

automated library — See library.

B

browse — To look through a list of directories, files, or computers.

C

click — To quickly press and release a mouse button.

client — A computer that accesses shared network resources provided by another computer (the server). See also server.

client system interface (CSI) — The software component, resident on the server system, that translates and routes messages between the ACS library manager and LibAttach.

control path — Allows client applications to gain access to tape cartridges by interacting with ACSLS.

CSI — See client system interface.

CSI variables — Environment variables defined on the server system and used to define various options to fine-tune communications between LibAttach and the CSI.

D

data path — Allows client applications to read and write data to a cartridge.

device driver — A program that enables a piece of hardware (device) to communicate with the computer’s operating system.

domain name system (DNS) — The Internet naming system that orders a sequence of names to identify host sites. Names are ordered in a hierarchy, from specific to general, separated by periods. Some domains in the Internet are .com (commercial), .edu (educational), .gov (U.S. Government), and .mil (U.S. military).

double-click — To rapidly press and release a mouse button twice without

moving the mouse. Double-clicking carries out an action, such as starting an application.

E

environment variable — A UNIX feature used to customize features and functions of the operating environment.

event — A significant occurrence in the system or an application that requires users to be notified or an entry to be added to a log.

event log — A file, maintained by the ACSEL, that contains messages describing library and ACSLS events.

event logger — See ACS event logger.

H

host — A computer that is attached to a network.

host name — The identifying name given to a computer.

I

internet — Used as a descriptive term, a collection of interconnected packet-switching networks.

Internet — Used as a formal name, a worldwide collection of networks that are interconnected and not administered by any single authority. Internet networks communicate using TCP/IP.

internet protocol (IP) — A protocol that defines a common layer over networks so that a packet of information can move across different networks to reach its final destination.

IP address — A unique number that identifies each host in a network.

L

LAN — See local area network.

LibAttach — A software component, resident on a Windows NT client system, that translates and routes messages between client applications and the CSI.

library — A library is composed of one or more ACSs, attached 4480 cartridge drives, volumes in the ACSs, and the ACSLS software that controls and manages the ACSs.

local area network (LAN) — A computer network in which any component in the network can access any other component. The network covers a physically limited area. This is the type of interface between an LMU and attached LSMs.

N

network adapter — Equipment that provides an electrical and logical interface between a network and specific attached equipment.

network interface (NI) — An interface between the server system and the client systems that maintains network connections and controls the exchange of messages. The NI is resident on the server system and each client system.

node — A device at a physical location on a network that performs a control function and influences the flow of data in the network. Can also refer to the points of connection in the links of a network.

O

ONC — Open Network Computing.

Open Systems Interconnection (OSI) — A software architecture model of the International Organization for Standardization. The OSI model provides

standards for the interconnection of data processing systems.

P

packet — A group of information in a fixed format that is transmitted as a unit over communications lines.

path — The location of a file within the directory tree.

protocol — A set of agreed-upon rules and conventions governing the formats and processes used in data communications. Protocols control the exchange of information between systems, including the format, timing, and error control of transmissions on a network.

R

RPC — Remote Procedure Call. A message-passing facility that allows a distributed application to call services available on various computers in a network.

Registry — A Windows NT database containing information about a computer's configuration.

S

server — A computer that provides a network service, such as disk storage or file transfer. See also client.

server system — In Nearline operations, the part of the library that is the residence for ACSLS or LibraryStation. The server system acts as an interface between a library and client systems.

service — In Windows NT, a process that performs a specific system function and often provides an application programming interface (API) for other processes to call. Windows NT services are RPC-enabled, meaning their API routines can be called from remote computers.

T

TCP/IP (transmission control protocol/ internet protocol) — An Internet standard protocol that enables communication between the same or different computers on a network. The transmission control protocol is connection-oriented; it monitors the correct transfer of data between computers. The Internet protocol is stream-oriented; it breaks data into packets and sends them to a network within the Internet.

U

UDP (user datagram protocol) — A protocol at the same layer as TCP that does not acknowledge transmission. UDP is therefore unreliable.

UNIX — An operating system originally developed by Bell Laboratories (now UNIX Systems Laboratories, Inc.) and used by a variety of computer systems.

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