

# *Solstice X.500 Client Toolkit Management*

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## *Preface*

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*Solstice X.500 Client Toolkit Management* introduces the components of the toolkit and contains information about how to configure and use the toolkit software to provide access to an X.500 directory service.

### *Who Should Use This Book*

Read this book if you are responsible for configuring a directory service component that includes the Solstice X.500 Client Toolkit, or for managing the toolkit software.

This book assumes that you have a basic understanding of X.500 directory service terms and concepts.

### *How This Book Is Organized*

**Chapter 1, “Overview”**, introduces the components of the Solstice X.500 Client Toolkit.

**Chapter 2, “Using x500clienttool”**, explains how to use the configuration utility `x500clienttool` to configure a directory user agent (DUA).

**Chapter 3, “Troubleshooting”**, explains how to use the trace utility, provides a list of error messages and recovery procedures, and contains information about the directory structure and files used by the Solstice X.500 Client Toolkit.

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## Related Books

The Solstice X.500 document set contains the following books:

- *Installing and Licensing Solstice X.500* explains how to install and license the toolkit.
- *Solstice X.500 Directory Management* explains how to use the server component of Solstice X.500, and contains information about configuring and managing a directory service.
- *Solstice X.500 Client Toolkit Management* (this book) explains how to use the tools provided with the toolkit, and how to manage the configuration database.
- *Solstice X.500 Client Toolkit XDS Reference* provides details of the XDS programming interface (API).
- *Solstice XOM Programming Reference* provides details of the XOM API, which is closely related to, and used by, the XDS API.

## What Typographic Changes Mean

The following table describes the typographic changes used in this book.

Table P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. machine_name% You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<div>machine_name% <b>su</b> Password:</div>
AaBbCc123	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
AaBbCc123	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be root to do this.

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## *Shell Prompts in Command Examples*

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

*Table P-2*    Shell Prompts

<b>Shell</b>	<b>Prompt</b>
C shell prompt	machine_name%
C shell superuser prompt	machine_name#
Bourne shell and Korn shell prompt	\$
Bourne shell and Korn shell superuser prompt	#



# Overview



The Solstice X.500 Client Toolkit provides the framework for building and running X.500 applications. This chapter introduces the components of the toolkit, and contains the following sections:

<i>Introducing the Solstice X.500 Client Toolkit</i>	<i>page 1</i>
<i>The XDS API</i>	<i>page 2</i>
<i>The Directory User Agent (DUA)</i>	<i>page 3</i>
<i>The x500clienttool Utility</i>	<i>page 3</i>
<i>The x500trace Utility</i>	<i>page 3</i>
<i>Code Examples</i>	<i>page 3</i>

## Introducing the Solstice X.500 Client Toolkit

The Solstice X.500 Client Toolkit contains the following components:

- A application programming interface (API) to an X.500-based directory service. This is an implementation of the XDS API defined by the X/Open™ company. See *Solstice X.500 XDS Programming Reference* for details of this API.
- A directory user agent (DUA).
- An administration utility, `x500clienttool`, that allows you to configure and control the DUA.
- A protocol trace utility.

- Code examples showing how you can use the XDS API.
- An RFC1006 driver. See *Solstice X.500 Directory Management* for details.

Figure 1-1 shows how the components of the toolkit work together to enable applications to work with a directory service.

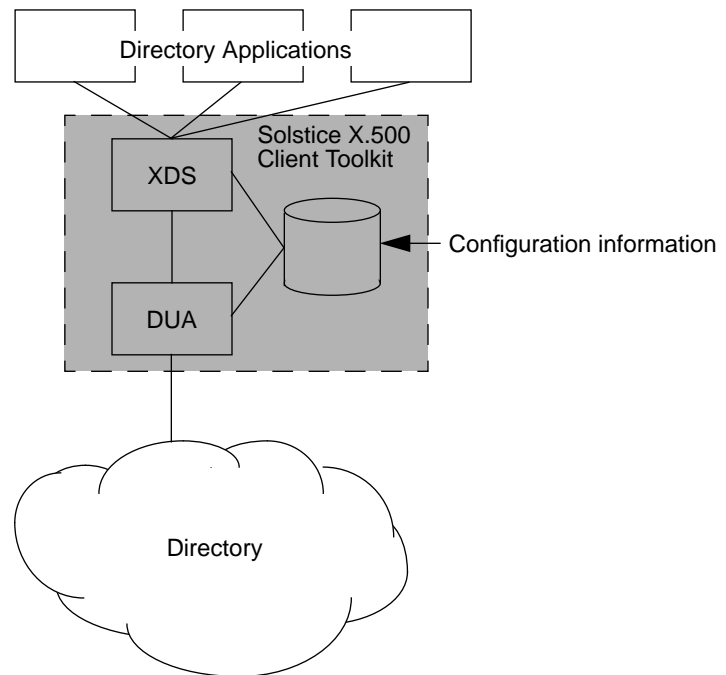


Figure 1-1 Components of the Solstice X.500 Client Toolkit

## The XDS API

The X/Open Directory Service Application Programming Interface (XDS) is the standard interface to an X.500 directory service. It consists of a set of functions that enables an application to interact with the directory. See *Solstice X.500 XDS Programming Reference* for details of the XDS API.



## *The Directory User Agent (DUA)*

A directory user agent (DUA) is the client component of a directory service. It communicates with the directory on behalf of an application. A directory system agent (DSA) is the server component of a directory service. A DUA binds to one or more DSAs, which in turn provide access to the information stored in the directory. Use the administration utility `x500tool` to configure the DUA.

## *The `x500clienttool` Utility*

The Solstice X.500 Client Toolkit includes a graphical administration utility, `x500clienttool`, which you use to configure and control the DUA. See Chapter 2, “Using `x500clienttool`” for details of how to use `x500clienttool`.

## *The `x500trace` Utility*

The X.500 trace utility analyses information sent to and received from a DSA. You can use it to detect protocol errors and diagnose and solve problems with the information exchange between applications and the directory service. See “The `x500trace` Utility” on page 22 for more information.

## *Code Examples*

The Solstice X.500 Client Toolkit contains examples of applications that use the XDS API. *Solstice X.500 XDS Programming Reference* contains complete listings of two examples. There are also some examples included with the installed software, which demonstrate how to use the XDS API to provide a simple command-line interface to the directory.



## *Using*x500clienttool

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This chapter explains how to use the X.500 DUA administration tool, `x500clienttool`. It contains the following sections:

<i>Basic and Optional Configurations</i>	<i>page 6</i>
<i>The x500clienttool Utility</i>	<i>page 6</i>
<i>Saving Configuration Information</i>	<i>page 8</i>
<i>Restoring Saved Configuration Settings</i>	<i>page 9</i>
<i>Printing Configuration Information</i>	<i>page 9</i>
<i>DUA Name and Address</i>	<i>page 10</i>
<i>Default DSA</i>	<i>page 11</i>
<i>Restricting Contacted DSAs</i>	<i>page 12</i>
<i>Schema Source Files</i>	<i>page 15</i>
<i>Session Parameters</i>	<i>page 17</i>
<i>Handling Referrals</i>	<i>page 18</i>
<i>XDS Default Network</i>	<i>page 18</i>
<i>Starting and Stopping the DUA</i>	<i>page 19</i>

## *Basic and Optional Configurations*

There are two items in the basic configuration:

- The name and address of the DUA (see “DUA Name and Address” on page 10).
- The name and address of the default DSA (see “Default DSA” on page 11). This is not mandatory, but you are strongly recommended to specify a default DSA.

You can use `x500clienttool` to configure several other items, but in many cases the default settings will be sufficient. The optional configuration items are:

- The set of DSAs that the DUA is permitted to contact directly (see “Restricting Contacted DSAs” on page 12)
- The source files used by the schema compiler (see “Schema Source Files” on page 15)
- Session parameters (see “Session Parameters” on page 17)
- How the DUA handles referrals (see “Handling Referrals” on page 18)
- The default network type for XDS (see “XDS Default Network” on page 18)

## *The `x500clienttool` Utility*

The `x500clienttool` utility is a tool for configuring the DUA component of Solstice X.500 Client Toolkit. You can also use it to start and stop the DUA (see “Starting and Stopping the DUA” on page 19).

The main window of `x500clienttool` has two menus, File and Agent. The File menu provides options for saving configuration information in the configuration database or a backup file (see “Saving Configuration Information” on page 8), for restoring previously saved information (see “Restoring Saved Configuration Settings” on page 9), and for printing the current configuration settings to a file (see “Printing Configuration Information” on page 9). The Agent menu contains options for the items that you can configure.

You do not need to stop the DUA when you run `x500clienttool`, unless you intend to modify the DUA name or address. The DUA continues to use the information in the existing configuration database. Stop and restart the DUA to use the updated configuration information. “Starting and Stopping the DUA” on page 19 tells you how to stop and restart the DUA.

### ▼ To Start `x500clienttool`

You must have superuser privileges or be logged in as root to use `x500clienttool`.

To start `x500clienttool`, type:

```
prompt# /opt/SUNWconn/x500/bin/x500clienttool
```

When `x500clienttool` starts, it loads the current configuration information from the configuration database, and displays the main window. Use the Agent menu to select the item you want to configure. Figure 2-1 shows the `x500clienttool` main window and the Agent menu.

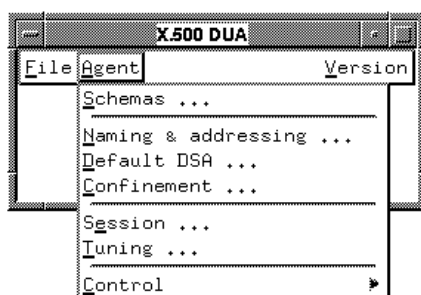


Figure 2-1 `x500clienttool` Main Window

### ▼ To Stop `x500clienttool`

Before you stop `x500clienttool`, ensure that you have saved any changes to the configuration database. To stop `x500clienttool`, select Stop from the File menu. The `x500clienttool` main window is closed.

## Saving Configuration Information

The DUA reads configuration information from the configuration database, `x500duad.init`. Whenever you make changes to the configuration you must save those changes to the configuration database and restart the DUA before those changes take effect. You can also save the configuration settings to a backup file, using the Save As option. You can copy a backup file to another machine and use it as a configuration template. Figure 2-2 shows the interaction between `x500clienttool`, the configuration database and a backup file.

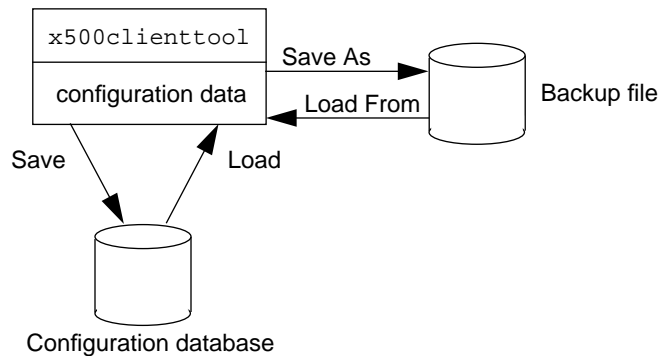


Figure 2-2 Storing Configuration Data

### ▼ To Save Configuration Settings in the Configuration Database

#### 1. Select Save from the File menu.

The configuration settings are saved in the configuration database `/var/opt/SUNWconn/OSIRoot/conf/x500duad.init`. The previous version of the database is overwritten.

### ▼ To Save Configuration Settings in Backup File

#### 1. Select the Save As option from the File menu.

A file selection window is displayed.

2. **Enter the name of the file where you want to store the configuration information.**

The configuration information currently held by `x500clienttool` is written to the file.

## *Restoring Saved Configuration Settings*

You can use the Load option from the File menu to read previously saved configuration information into `x50clienttool`. The information need not have been saved on the same system. You can do this to restore a backup of the configuration if the data file becomes corrupted. It is also useful as a way of copying configuration information if you want to create a configuration template for several DUAs that require similar configurations.

### ▼ To Restore Saved Configuration Settings

1. **Select the Load option from the File menu.**

A file selection window is displayed.

2. **Enter the name of the file that holds the stored configuration information.**

The information is read into `x500clienttool`.

## *Printing Configuration Information*

If you require a readable copy of the configuration settings, use the Print option. This writes configuration information to a file that you can read or print.

### ▼ To Print Configuration Settings

1. **Select Print option from File menu.**

A file selection window is displayed.

2. **Specify the name of the file where you want to record the configuration settings.**

The configuration information currently held by `x500clienttool` is written to the file.

## DUA Name and Address

The DUA name and address is supplied to a DSA when the DUA submits a Bind request. It is used by the DSA to return information from the directory to the right client. You must configure the DUA name and address so that your application can communicate with the directory.

### ▼ To Configure the DUA Name and Address

1. Select **Control** from the **Agent** menu and stop the DUA.

2. Select **Naming & Addressing** from the **Agent** menu.

The Naming and Addressing window is displayed, as shown in Figure 2-3.

The screenshot shows a window titled "X.500 DUA - Naming & addressing". It contains the following fields and options:

- Entry name:** /C=us/O=acme/OU=myorg/CN=mydua
- Application Entity Qualifier:** (empty text box)
- Application Process Title:** (empty text box)
- Presentation selector:** (text box) with radio buttons for Char and Hex.
- Session selector:** (text box) with radio buttons for Char and Hex.
- Transport selector:** (text box) with radio buttons for Char and Hex.
- TCP/IP address:** (text box) with radio buttons for Char and Hex.
- CONS \*84 address:** (text box) with radio buttons for Char and Hex.
- X.25 address:** (text box) with radio buttons for Char and Hex.
- CLNS address:** (text box) with radio buttons for Char and Hex.

At the bottom of the window are "OK" and "Cancel" buttons.

Figure 2-3 Naming and Addressing Window

3. Specify the distinguished name of the DUA in the **Entry name** field.

4. Specify the **Application Entity Qualifier** and **Application Process Title** of the DUA.



**5. Specify the Presentation, Session and Transport selectors, in either character or hexadecimal format. Click SELECT on the button that indicates the format you are using.**

The Presentation and Session selectors are optional, but the Transport selector must be specified.

**6. Specify the network address.**

Specify at least one network address for the DUA. If the DUA can communicate using more than one type of network, specify a network address for each type of network available to the DUA. For each network address, click SELECT on the button indicating the format you have used (character or hexadecimal). Table 2-1 shows the formats available for each network type.

*Table 2-1 Network Address Formats*

Address Type	Formats
TCP/IP address	Hostname (character), dotted-decimal format (character) or 8 hex digits (hexadecimal)
CONS '84 address	NSAP (character format or hexadecimal format)
X.25 address	X.121 address (hexadecimal)
CLNS address	NSAP (character format or hexadecimal format)

**7. Click on OK.**

The Naming and Addressing window is closed.

## *Default DSA*

The Default DSA is the DSA that the DUA binds to by default. If you want to bind to a different DSA, your application must supply information about that DSA in the Session object supplied to the XDS Bind() function.

### ▼ To Specify the Default DSA

**1. Select the Default DSA option from the Agent menu.**

The Default DSA window is displayed, as shown in Figure 2-4 on page 12.

Figure 2-4 Default DSA Window

**2. Complete the naming and addressing information for the DSA you want to use as the Default DSA.**

The DSA's entry name must be in distinguished name format. The Presentation and Session selectors are optional. See Table 2-1 on page 11 for details of the network address formats.

**3. Click on OK.**

The Default DSA window is closed.

## Restricting Contacted DSAs

By default, a DUA can contact any DSA. You can define a set of DSAs that the DUA can contact directly by using the Confinement option of the Agent menu. If you define such a set, the DUA cannot directly contact a DSA that is not included, though the DSAs in the set may use chaining or multicasting to contact DSAs outside the set. If you define a set of DSAs that the DUA is permitted to contact, you must include the default DSA. You can have a set that contains only the default DSA.

### ▼ To Add a DSA

**1. Select the Confinement option from the Agent menu.**

The DSA Confinement window is displayed, as in Figure 2-5 on page 13.

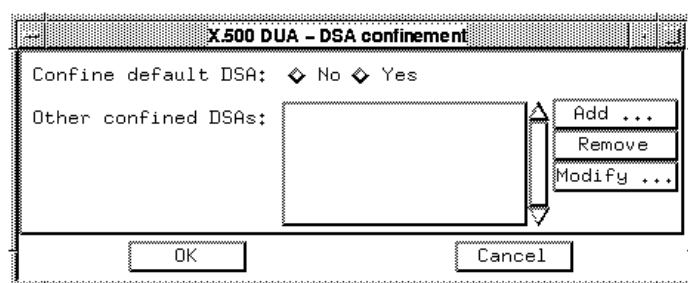


Figure 2-5 DSA Confinement Window

**2. Click SELECT on the Add button.**

A Confined DSA window is displayed, as shown in Figure 2-6.

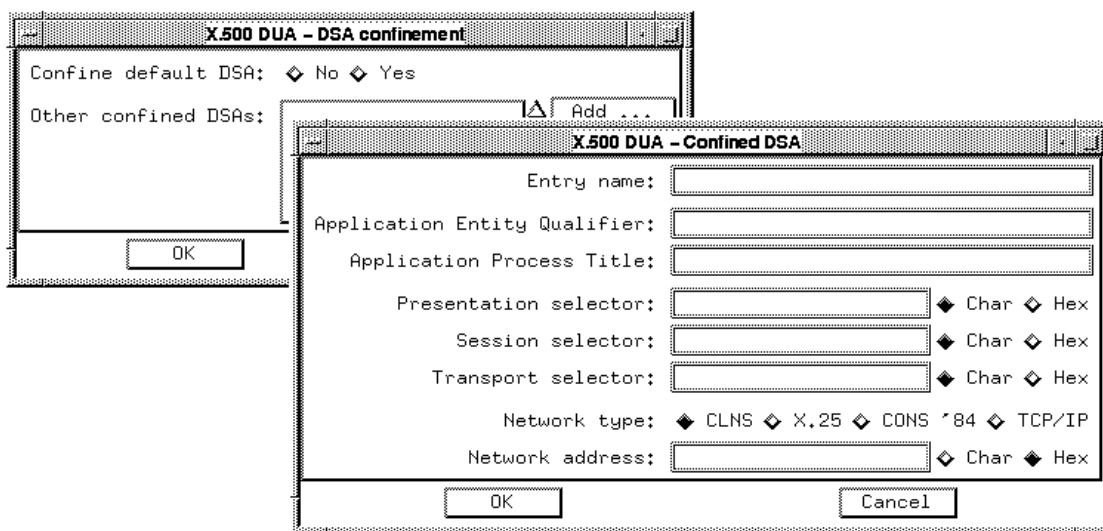


Figure 2-6 Confined DSA Window

**3. Complete the naming and addressing information for the DSA you want to add to the set.**

The DSA's entry name must be in distinguished name format. The Presentation and Session selectors are optional. See Table 2-1 on page 11 for details of the network address formats. If the default DSA is not already included in the set, it is added automatically.

**4. Click SELECT on the OK button.**

The Confined DSA window is closed, leaving the DSA Confinement window.

**5. Click on OK.**

The DSA Confinement window is closed.

▼ **To Add the Default DSA**

The default DSA is automatically added to the set if you specify any other DSA. To add the default DSA when no other DSAs are specified:

**1. Select the Confinement option from the Agent menu.**

The DSA Confinement window is displayed, as in Figure 2-5 on page 13.

**2. Click on the Yes button to indicate that the default DSA is to be added to the Confined DSA set.**

**3. Click on OK.**

The DSA Confinement window is closed.

▼ **To Modify a DSA**

**1. Select the Confinement option from the Agent menu.**

The DSA Confinement window is displayed, as in Figure 2-5 on page 13.

**2. Select a DSA from the list of confined DSAs.**

**3. Click SELECT on the Modify button.**

A Confined DSA window is displayed, as shown in Figure 2-6 on page 13, including the current configuration settings for the selected DSA.

**4. Modify the naming and addressing information for the DSA.**

5. **Click SELECT on the OK button.**  
The Confined DSA window is closed, leaving the DSA Confinement window.
6. **Click on OK.**  
The DSA confinement window is closed.

#### ▼ To Remove a DSA

1. **Select the Confinement option from the Agent menu.**  
The DSA Confinement window is displayed, as in Figure 2-5 on page 13.
2. **Select a DSA from the list of confined DSAs.**
3. **Click SELECT on the Remove button.**  
The DSA is removed from the list of confined DSAs.
4. **Click on OK.**  
The DSA confinement window is closed.

## *Schema Source Files*

The schema is constructed from information held in files, as described in *Solstice X.500 Directory Management*. Use `x500clienttool` to specify the names of the files that hold the schema definition.

#### ▼ To Add a Schema Source File

1. **Select the Schemas option from the Agent menu.**  
The Schema list window is displayed.
2. **Click SELECT on the Add button.**  
A file selection window is displayed, as in Figure 2-7 on page 16.

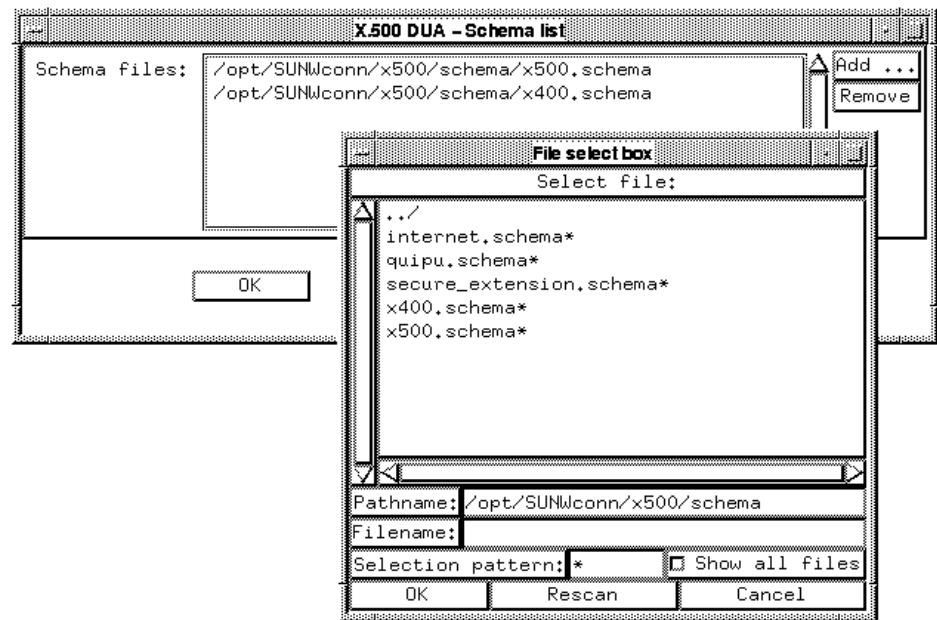


Figure 2-7 Schema Add File Windows

**3. Specify the schema source file that you want to add, and click SELECT on the OK button.**

Schema source files can be stored in any directory. The file is added to the list of schema source files and the file selection window is closed.

**4. Click on OK.**

The Schemas window is closed.

▼ **To Remove a Schema Source File**

**1. Select the Schemas option from the Agent menu.**

The Schema window is displayed.

**2. Select the file to be removed from the list of schema files.**

**3. Click SELECT on the Remove button.**

The file is removed from the list.

## Session Parameters

You can configure a number of parameters that control the DUA's use of the session layer:

- The maximum number of outstanding synchronization points permitted. This controls the ROSE window size. The default is 5.
- The Session timer (TIM). This controls the time for which a session connection waits for an accept before aborting. The default is 30 seconds.
- Whether extended concatenation is used. The default is that it is used.
- Whether transport connections should be reused, and if so, a timer controlling how long an unused connection is retained. By default, transport connections are reused and unused connections are maintained for 30 seconds.

### ▼ To Set Session Parameters

#### 1. Select the Session option from the Agent menu.

The Session configuration window showing the current settings of the Session parameters is displayed, as shown in Figure 2-8. If you are configuring these parameters for the first time, the default settings are displayed.

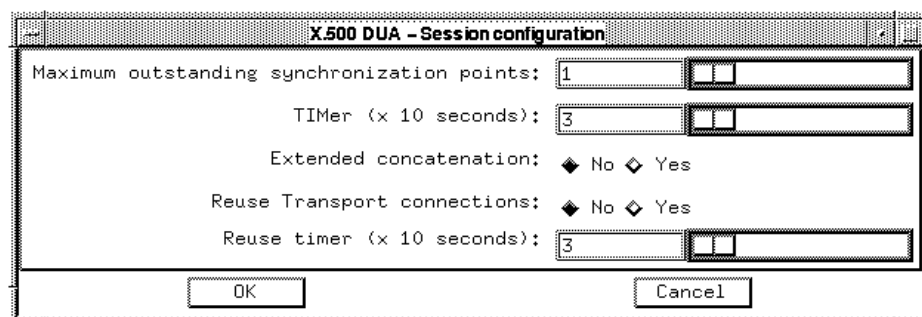


Figure 2-8 Session Configuration Window

#### 2. Modify the Session parameters as required.

## 3. Click on OK.

The Session Configuration window is closed.

## Handling Referrals

You can specify whether the DUA handles referrals automatically or passes the information on to the application. By default, the DUA handles referrals automatically on behalf of the application.

### ▼ To Specify How Referrals Are Handled

#### 1. Select the Tuning option from the Agent menu.

The Tuning menu is displayed, as shown in Figure 2-9.

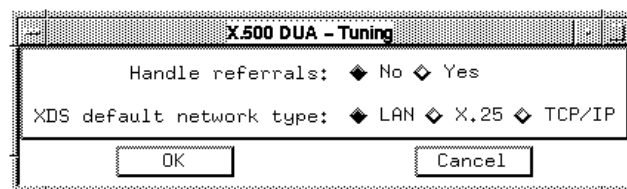


Figure 2-9 Tuning Window

#### 2. If you want the DUA to handle referrals automatically, click SELECT on the Handle referrals: Yes option button. Otherwise, click on the No option button.

#### 3. Click on OK.

The Tuning window is closed.

## XDS Default Network

You can specify the type of network that XDS uses by default when the network type is not explicitly known for the DSA it is sending a bind request to. This enables your application to make network connections in some cases when network addresses are incompletely specified.



### ▼ To Specify the Default Network for XDS

1. **Select the Tuning option from the Agent menu.**  
The Tuning menu is displayed, as shown in Figure 2-9 on page 18.
2. **Click SELECT on the button indicating the default network type to be used by XDS.**
3. **Click on OK.**  
The Tuning window is closed.

## Starting and Stopping the DUA

You can start and stop the DUA using `x500clienttool` or from the command line.

### ▼ To Start the DUA Using `x500clienttool`

1. **Ensure that you have saved any changes to configuration information.**  
See “Saving Configuration Information” on page 8 for information about saving your configuration settings in the configuration database.
2. **Select the Control option from the Agent menu and choose Start.**  
Figure 2-10 shows how to use the Control option.

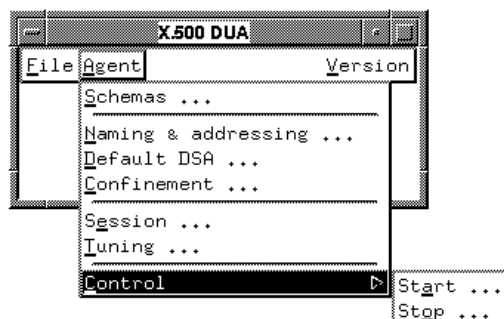


Figure 2-10 `x500clienttool` Main Window Control Option

A status window is displayed and the DUA daemon, `x500duad`, is started. It uses the configuration information stored in the configuration database.

## ▼ To Start the DUA From a Command Line

1. **Log in as root or become superuser.**
2. **Type the following command:**

```
prompt# /etc/rc2.d/S94x500client start
```

The DUA daemon, x500duad, is started

## ▼ To Stop the DUA Using x500clienttool

1. **Select the Control option from the Agent menu and choose Stop.**  
A status window is displayed and the DUA daemon, x500duad, is stopped immediately.

## ▼ To Stop the DUA From a Command Line

1. **Log in as root or become superuser.**
2. **Type the following command:**

```
# /etc/rc2.d/S94x500client stop
```

The DUA daemon, x500duad, is stopped immediately.

## Troubleshooting



This chapter contains information that will help you diagnose and fix problems with the Solstice X.500 Client Toolkit and your directory service application. It contains the following sections:

<i>Checking the Toolkit Configuration</i>	<i>page 21</i>
<i>The x500trace Utility</i>	<i>page 22</i>
<i>Running the Trace Utility</i>	<i>page 22</i>
<i>Trace Output Example</i>	<i>page 23</i>
<i>Error Messages and Recovery Procedures</i>	<i>page 24</i>
<i>General Errors</i>	<i>page 25</i>
<i>Configuration Utility Messages</i>	<i>page 26</i>

### Checking the Toolkit Configuration

This section explains how to use the code examples provided with the Solstice X.500 Client Toolkit to check that the software is installed and configured correctly:

1. Install and license the software as described in the booklet *Installing and Licensing Solstice X.500*.
2. Complete at least the basic configuration tasks, as described in “Basic and Optional Configurations” on page 6, including specifying the name and address of the default DSA.

3. Compile the code examples in the directory  
`/opt/SUNWconn/x500/examples/programming/sun`. The `README` file in the same directory explains how to compile the examples.
4. The examples provide a very simple command-line interface to the directory. Use the `list` command to retrieve information about an entry you know is in the directory. If you are not sure what entries are in the directory, use the command `list /` which lists all the entries below the root entry (`/`). If data is returned from the directory, the toolkit is installed and configured correctly.

## *The x500trace Utility*

Use the X.500 trace utility to analyze information sent to and received by directory components. The trace utility detects protocol errors which in turn help you diagnose problems with construction of protocol elements.

### *Running the Trace Utility*

To run the trace utility, log in as `root` or become `superuser` and type:

```
prompt# /opt/SUNWconn/x500/bin/x500trace [-dfr] [-p <protocols>] [-i <processes>] [<filters>]
```

The command-line options are:

- d: Returns a full trace of ROSE and Association Control Service Elements (ACSEs).
- f: Returns a full buffer trace. Without this option, only the first twenty lines of a message bodypart is displayed.
- r: Suppresses the names of PDU service elements from the trace. This option is valid only when you specify the `pdu` filter.

Valid protocols are shown in Table 3-1. If you do not specify a `-p` option, then all protocols are traced.

*Table 3-1* x500trace Protocols

Protocol	Description
dap	Traces DAP
dsp	Traces DSP

Valid processes are shown in Table 3-2.

*Table 3-2* x500trace OSI Processes

Process	Description
x500dsad	Traces the DSA server process
x500duad	Traces the DUA process
x500ldad	Traces the DAP part of the LDAP process

Valid filters are shown in Table 3-3.

*Table 3-3* x500trace Filters

Filters	Description
debug	Recovers a full trace of the remote operation service element (ROSE) and ACSE presentation. The <code>-d</code> command-line option has the same effect as this filter.
events	Returns status and error messages recovered from the local DSA, LDAP server or DUA.
pdu	Returns ASN.1 decoding of incoming and outgoing messages.

## Trace Output Example

The following example shows the trace output from a bind.

```
# /opt/SUNWconn/x500/bin/x500trace -p dap event pdu
x500duad      14:55:07[9973] DAP Bind Confirmation
```

```

b1 39 RO-BIND Result *[17] Length=57 (57)
  31 37 *[DirectoryBindResult] Length=55 (55)
    a0 35 Credentials *[0] Length=53 (53)
      a0 33 SimpleCredentials *[0] Length=51 (51)
        30 31 *[SimpleCredentials] Length=49 (49)
          a0 28 name *[0] Length=40 (47)
            30 26 *[DistinguishedName] Length=38 (38)
              31 0e *[RelativeDistinguishedName] Length=14 (36)
                30 0c *[AttributeValueAssertion] Length=12 (12)
                  06 03 [type] Length=3 (10)
                    55040a
                    OrganizationName
                  13 05 [PrintableString] Length=5 (5)
                    414e59434f
                    A N Y C O
              31 14 *[RelativeDistinguishedName] Length=20 (20)
                30 12 *[AttributeValueAssertion] Length=18 (18)
                  06 03 [type] Length=3 (16)
                    550403
                    CommonName
                  13 0b [PrintableString] Length=11 (11)
                    44454641554c545f445341
                    D E F A U L T _ D S A
          a2 05 password *[2] Length=5 (5)
            04 03 [OctetString] Length=3 (3)
              61646d
              a d m

```

## Error Messages and Recovery Procedures

This section lists the error messages returned by the Solstice X.500 Client Toolkit software, and gives recovery procedures where appropriate. It does not include status messages or messages that themselves indicate the recovery procedure required. If you receive error messages that are not listed in this section and are not self-explanatory, contact your authorized service provider.

The error messages are divided into the following sets:

- “General Errors” on page 25 contains the errors that can be returned by more than one of the utilities in the Solstice X.500 Client Toolkit.
- “Configuration Utility Messages” on page 26 contains the errors that can be returned by the configuration utility.

## *General Errors*

This section contains a list of error messages that can be returned by several components of Solstice X.500 Client Toolkit. The messages have the following format:

`<component>: <entity>: <error>`

where:

- `<component>` is the utility or component of the toolkit that is returning the error. Not all error messages indicate a component.
- `<entity>` is the particular entity where the error has occurred. This can be a file, attribute, object class or any other object used by the software.
- `<error>` is the text indicating the error. The rest of this section is an alphabetical list of the possible values of `<error>`, and where necessary includes an explanation of the error and the recovery procedure required.

### **entry already present in list of restricted DSAs**

You have specified a DSA more than once in the set of DSAs the DUA may contact directly.

### **file not opened**

An error occurred when opening a file. Check the file location and permissions.

### **internal error**

An internal error has occurred. Try the operation again. If the same error occurs, contact your authorized service provider.

### **invalid file**

The file you have specified cannot be accessed or cannot be used. Check that you have specified the file name and path correctly. Check that the file permissions are set correctly.

### **invalid range**

An attribute value is out of range.

### **invalid syntax**

An attribute value is not specified in the correct syntax.

**no more memory**

There is insufficient memory for the operation to be completed. See your system administrator.

**system call failure**

This error usually indicates a problem with system resources.

**wrong syntax used with CONTROL ACCESS**

The value of the Control-Access attribute is not specified correctly.

**wrong syntax used with SHIELD ENTRY**

The value of the Shield-Entry attribute is not specified correctly.

## *Configuration Utility Messages*

**Corrupt init file: <line information>**

The configuration data file,  
/var/opt/SUNWconn/OSIROOT/conf/x500duad.init, is corrupt.  
Restore a recent backup copy of the file.

**Default DSA Not Found**

The default DSA you are trying to delete is not defined. Check that you have specified the DSA correctly.

**DSA must have a name**

The DSA name is missing. Specify a name for the DSA.

**DSA not found**

The DSA you are trying to delete is not defined. Check that you have specified the DSA correctly.

**DN <distinguished-name> <error information>**

The distinguished name is not correctly specified.

**/etc/rc2.d/S94x500client: <error information>**

This indicates an error starting the DUA. It is accompanied by an operating system error indicating the cause. Fix the system error and start the DUA again.

**Field <name> too long, max length <length limit>**

The value specified in the named field is too long. The length of the value cannot exceed the limit specified.



**Hostname not found: <name>**

The hostname specified cannot be resolved into a IP address.

**Invalid nettype in suffix: <suffix>**

The network type specified is incorrect. The nettype must be 0, 1 or 2.

**Invalid value: <value> for default network, [0..2] expected**

The value you have specified for the default network type is not valid. The network type must be 0, 1 or 2.

**Invalid value: <value> for dua\_referral, [0..1] expected**

The value you have specified for the controlling whether the DUA handles referrals is not valid.

**Invalid value: <value> for max sync points, [1..9] expected**

The value you have specified for the maximum number of synchronization points is not valid. Specify a value between 1 and 9.

**Invalid value: <value> for TIMer, [3..12] expected**

The value you have specified for the session timer is not valid. Specify a value between 3 and 12 seconds.

**Invalid value: <value> for concatenation PDUs, [on/off] expected**

The value you have specified for concatenation of PDUs is not valid.

**Invalid value: <value> for reuse transport connections, [on/off] expected**

The value you have specified for the reuse of transport connections is not valid.

**Invalid value: <value> reuse timer, [3..120] expected**

The value you have specified for the reuse timer is not valid. Specify a value between 3 and 120 seconds.

**Invalid X.25 address: <address> exceeds maximum length of 15 digits**

The X.25 address specified is longer than the maximum permitted length.

**Invalid X.25 address: <address> must be digits (0-9) in HEX format**

The X.25 address specified is incorrect. Either the address included non-decimal digits, or you have not set the format to Hex.

**NULL NSAP address is not allowed**

You must provide an NSAP.

**Reading init file, could not find line: Start**

The configuration utility cannot read the existing data file. The file is corrupt. Restore the most recent backup and reapply any changes.

**The entry name is already present in the list of restricted DSAs**

The DSA you are adding to the Confined DSA set is already included.

**Too many schema source files**

You have specified more than 99 schema source files.

**Writing init file: <file>: <system error message>**

An error occurred when writing in specified file.

**Writing <file>: <system error message>**

An error occurred when writing in specified file.

## *Packages, Directories and Files*

This section contains information about the directories used by the Solstice X.500 Client Toolkit software. The toolkit software is contained in the following packages:

- SUNWx500c
- SUNWx500u (also used by the Solstice X.500 Directory Server)

See *Installing and Licensing Solstice X.500* for details of how to install these and the other packages included in Solstice X.500.

The installation procedure for SUNWx500c and SUNWx500u installs files in the directory structure shown in Figure 3-1 on page 29. If the directories do not already exist, they are created automatically by the installation procedure.

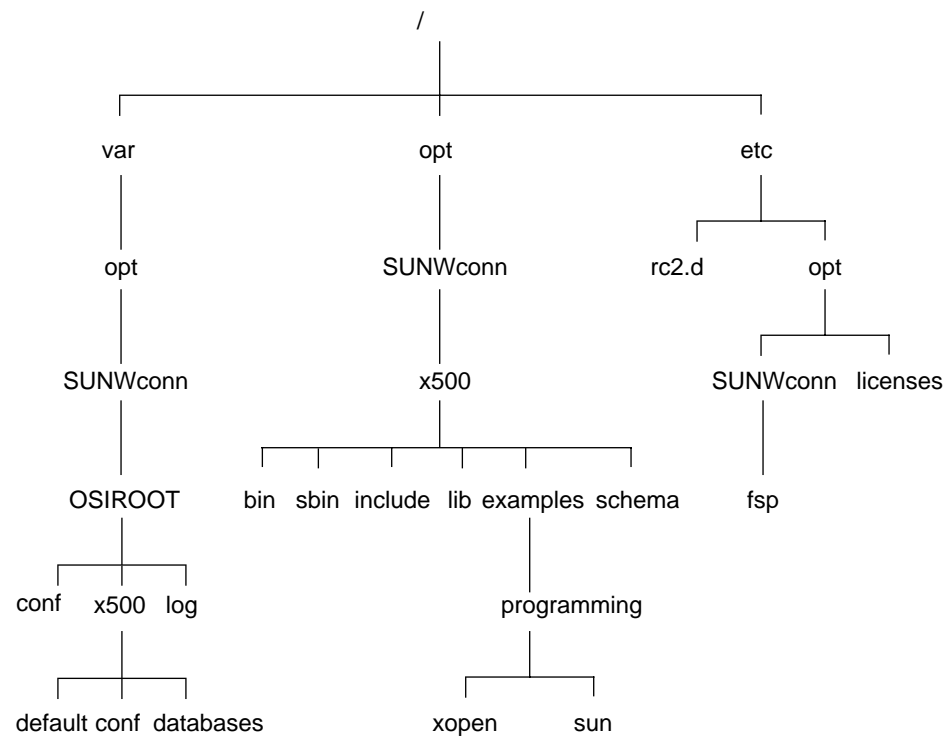


Figure 3-1 Solstice X.500 Client Toolkit Directory Structure



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