HP Data Protector

Integrating an ACSLS server through a firewall

Technical white paper

Table of contents

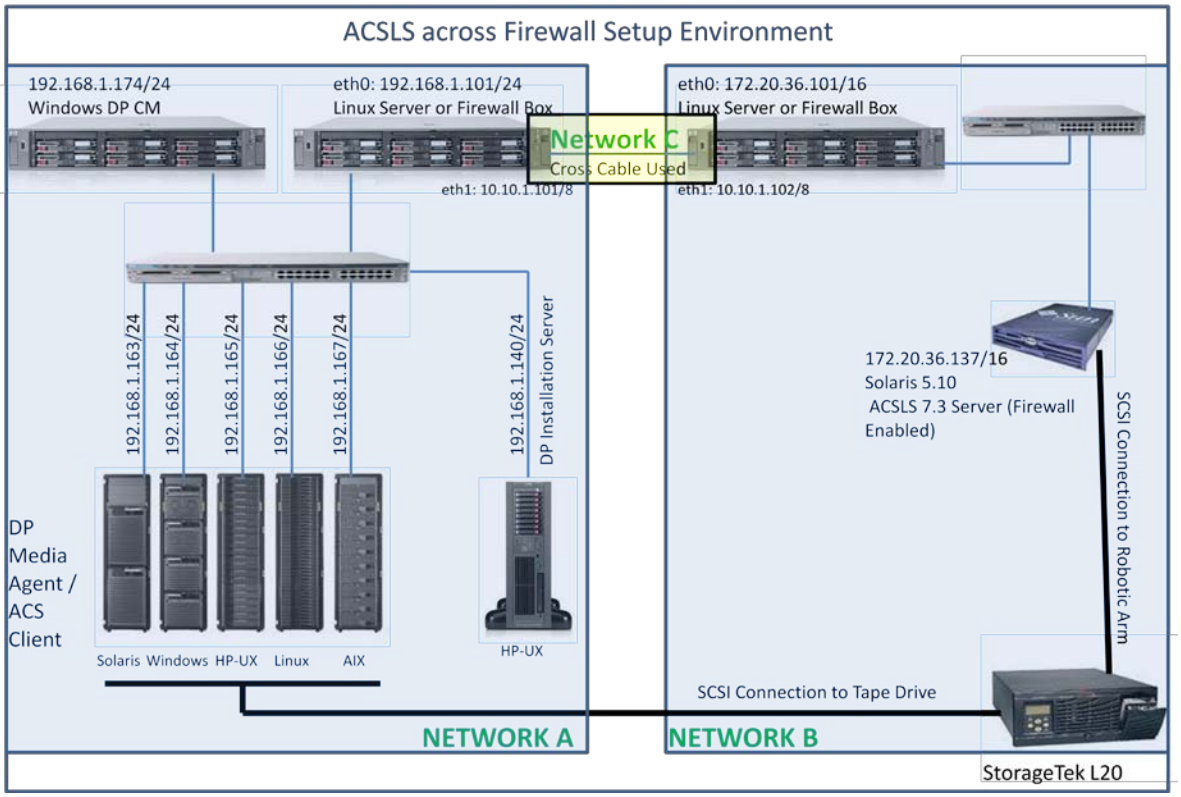
Introduction

This white paper explains the integration of ACSLS-controlled StorageTek libraries with HP Data Protector. The whitepaper contains details of installation and configuration of the ACSLS Server, installation and configuration of Data Protector with the ACSLS library, and enabling ACSLS through firewall. After reading this paper you will be able to set up an ACSLS library, configure it to be used in Data Protector, and enable ACSLS to be used through a firewall.

What is ACSLS?

Automated Cartridge System Library Software (ACSLS) is Sun StorageTek's server software that controls a Sun StorageTek Automated Cartridge System (ACS) tape library. An Automated Cartridge System (ACS) library is connected and controlled through pass thru-ports (PTPs). ACSLS accesses and manages information stored in one or more ACSs through command processing across a network. The software includes a system administration component, interfaces to client system applications, and library management facilities.

Data Protector provides a dedicated StorageTek ACS library policy for configuring a StorageTek ACS library as a Data Protector backup device. The following is an example of a Data Protector ACS setup:



The system on which you install and configure the ACSLS Software application is called the **ACSLS Server**. In the figure above, this is on the right, labeled 'Solaris 5.10 ACSLS 7.3 Server (Firewall Enabled))'.

Each system on which you install Media Agent software and which accesses the library robotics through the ACSLS is called a **Data Protector Media Agent / ACS Client**.

This section describes the installation procedure for ACSLS 7.3

Note: ACSLS installation is best explained in documents provided with the ACSLS Software kit:

- *StorageTek ACSLS Installation, Configuration, and Administration Guide*
- *Library Attach for Windows Servers—Installations and Operations*

Installing a Data Protector Cell Manager and clients

For Data Protector Cell Manager and client installation, please follow the instructions provided in the *HP Data Protector Installation and Licensing Guide*.

Installing an ACSLS server

Automated Cartridge System Library Software (ACSLS) is Sun StorageTek's server software that controls a Sun StorageTek tape library. An Automated Cartridge System (ACS) is a group of tape libraries connected through pass-through ports (PTPs). ACSLS accesses and manages information stored in one or more ACSs through command processing across a network. The software includes a system administration component and interfaces to client system applications, and library management facilities.

Data Protector provides a dedicated StorageTek ACS library policy for configuring a StorageTek ACS library as a Data Protector backup device.

The system on which you install and configure the ACSLS application is called the **ASCSLS server**.

Each system on which you install Media Agent software and which accesses the library robotics through the ACSLS is called an **ACS client**.

This section describes the installation procedure for ACSLS 7.3

Note: ACSLS installation is best explained in documents provided with the ACSLS Software kit:

- *StorageTek ACSLS Installation, Configuration, and Administration Guide*
- *Library Attach for Windows Servers—Installations and Operations*

Installing Solaris

For installation procedures, please refer to the Solaris Installation instructions.

Note: ACSLS requires a minimum memory requirement of 512 MB, and that the following are created:

- `swap` —1 GB (minimum)
- `/export/home` — 2 GB (minimum)
- `/export/backup` — 3 GB (minimum)

If you are using:

- UNIX File System (UFS), this is usually slices 5 and 6.
- ZFS — two zfs files must be mounted: `/export/home` and `/export/backup`.

Preparing for ACSLS installation

Before you install ACSLS, check the following:

- The server operating system and system hardware is properly configured, connected, powered on, and ready.
- For SCSI-connected robotics between the ACSLS Server and ACSLS Library, use a differential connection where possible. If a single-ended SCSI controller is used, limit the cable distance to three meters between the ACSLS Server and the ACSLS Library. With low-voltage differential (LVD), the cable should be no more than 10 meters. High-voltage differential (HVD) SCSI cables can extend up to 20 meters.

Connecting an STK library (robotic) to the ACSLS Server

Before installating the ACSLS software, connect the library to the ACSLS Server:

1. Power down the client system.
2. Attach the backup device.
3. Power up the device first, and then the client system.
4. Stop the system by pressing Stop and A. Reboot the system to the `ok` prompt by pressing Ctrl+(Pause/Break) keys together at the time of boot process.

5. Once you have the ok prompt, you need to set auto-boot env to false before probing for devices. More commands used in this prompt are listed in 'Useful commands in Solaris' in the Appendix on page 16.

```
ok> setenv auto-boot? False
ok> reset-all
```

This command will reset all registers.

6. When the ok prompt appears, enter:

```
ok> probe-scsi-all
```

This displays the devices connected to the machine. Check whether the connected ACS STK library is recognized, and make a note of the target ID of the library. If this command does not display the STK Library, check the physical connectivity, and reboot again.

Note: This command can take more than a minute to complete and return to the ok prompt.

Example:

```
Initializing  1024MB of memory at addr         200000000
SC Alert: SC Request to send Break to host.
/
ok probe-scsi-all

/pci@1c,600000/scsi@2,1
Target 0
  Unit 0   Removable Device type 8     STK     L20             0214

ok _
```

```
ok> setenv auto-boot? True
```

Put back the actual configuration once the SCSI device is shown in the prompt.

```
ok> boot –r
```

Perform a reconfiguration reboot.

7. Return to normal running:

```
Go
```

Installing the ACSLS server

Using pkgadd:

1. Log into the system as root.
2. Insert the ACSLS CD.
3. In a terminal window or at the command prompt, enter:

```
cd /cdrom/cdrom0
```

4. Install using pkgadd:

pkgadd -d .

Note: Make sure there is a space and a period after –d.

The following packages are available:

```
1  STKacsls      Sun StorageTek Automated Cartridge System Library Software
                    (sparc) release 7.3.0

2  STKchanger    Sun StorageTek SCSI Media Changer Software
                    (sparc) release 3.0.0

Select package you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]:
```

5. When prompted to select a package, press Return.
6. When promoted whether you wish to continue with the installation of STKacsls, type '**y**' and press Return.
7. When promoted whether you wish to continue with the installation of STKchanger, type '**y**' and press Return.
8. When promoted whether you wish to install ACSLS in the default directory /export/home/, type '**y**' and press return.
9. When promoted to create any required directories, type '**y**' and press Return.
10. When prompted to install setuid/setgid files, type '**y**' and press Return.

11. Eject the CD.

Note: ACSLS requires specific user IDs (acss, acssa and acsdb), however, these are created automatically at the time of installation of ACSLS. The home directories for the acsss, acssa, and acsdb user IDs reside under the ACSLS installation directory. The default installation directory for acsss is `/export/home/ACSSS` (referred to as `$ACS_Home`). The home directories for the ACSLS user IDs are:

```
acsss /export/home/ACSSS
acssa /export/home/ACSSA
acsdb /export/home/acsdb
```

Installing ACSLS software using install.sh

1. Change directories:

   ```
   cd /export/home/ACSSS/install
   ```

2. To initiate the installation shell script, enter

   ```
   ./install.sh
   ```

   If shared memory settings have not been defined, you are prompted to allow the script to set shared memory and reboot the server:

   ```
   This server is not set with shared memory required for ACSLS and the Database.
   Set shared memory and reboot the server to take effect at kernel level? (y or n):
   ```

   Respond **y** to the prompt.

   The server reboots.

   When the server comes back, log in as root, `cd` to `/export/home/ACSSS/install` (if you are not already in it), and restart `install.sh`.

3. Enter the database backup directory.

   By default, this is `/export/backup`. If the following warning is displayed, prompting you to pick a directory in another file system, choose another file system. For example: `/ipr/backup`.

   Warning message:

   ```
   root@fwallb1:~
   What directory do you want to use for
   ACSLS database backups [/export/backup]?

   ask_for_bkup_partition.sh 1693: Warning: /export/backup is in the same file
   system as /export/home/ACSSS.  Please pick a directory in another file
   system.

   What directory do you want to use for
   ACSLS database backups [/export/backup]? /ipr/backup
   ```

4. Respond **y** to the prompt for automatic startup on reboot.

   ```
   root@fwallb1:~
   Do you want your system configured so that when it reboots it
   automatically restarts the ACSLS? (y or n): y

   fix_rc.sh 1864:  Adding commands to automatically restart ACSLS on reboot.

   Do you want to install the SCSI device driver for SCSI libraries? (y or n): y

   Installing 64-bit mchanger
   Probing for libraries...
   ```

   Note: By selecting **y** to allow ACSLS to automatically start at system boot time, you also allow ACSLS to automatically shutdown prior to a system shutdown or reboot. This is recommended and will prevent database errors from being written to the `acsss_event.log` when the system is rebooted.

   Option: If you have a SCSI or fibre-attached library, continue with step 5.

5. Respond **y** or **n** to the prompt for installing a SCSI device driver for SCSI libraries.

   `Do you want to install the scsi device driver for SCSI libraries? (y or n): y`

   Refer to the following example for the prompts you need to answer.

   Note: Sun StorageTek libraries attached behind supported Fibre host-bus adapters (HBAs) can be auto-sensed by ACSLS using the capabilities included in supported HBA software. Supported HBAs currently include all contemporary Emulex, Qlogic, and Sun-branded HBAs. The ACSLS SCSI driver installation utility, `install_scsi_sol.sh` can configure multiple mchanger devices easily without the need for explicit user interaction. Libraries behind non-supported HBAs continue to function in the traditional manner, where you declare the target and LUN address for each attached library. The installation utility then displays each library for which a mchanger instance has been created.

Example:

```
bash-3.00# ./install.sh
install.sh 1673:  Starting ACSLS 7.3.0 installation.

Do you wish to continue with the install? (y or n):

Checking for shared memory setting...
No Informix server process present.

What directory do you want to use for Informix backups [/export/backup]?
/export/backup

Back up directory is: /export/backup

Creating links to Database libraries...
Initializing the Database server....


Database server successfully initialized.

Trying to start up the DB server - Attempt 1
Database server started successfully.
Database successfully created....

All permissions granted to lib6.
All permissions granted to acsss.
Automatic backup schedule updated.

Your system is currently configured in such a manner that when it reboots, it will
automatically restart the ACSLS.
Do you want your system configured so that when it reboots it automatically
restarts the ACSLS? (y or n): y

fix rc.sh 1864: Adding commands to automatically restart ACSLS on reboot.

Do you want to install the SCSI device driver for SCSI libraries? (y or n): y

Installing 64-bit mchanger

Enter the scsi device(s) that correspond to each STK library libraries. Separate
devices with a space (example: 4 5 6).
Remember that scsi devices are numbers between 0 and 15.
==> 0:0

Is this correct? (y or n): y

-- >SCSI ID should be known using operator panel and give name as /dev/mchanger4
```

This step finishes the installation of the ACSLS server.

You can find the SCSI address of the STK Library in three different ways:

- Using the `probe-scsi-all` command output from the ok prompt:

```
Initializing  1024MB of memory at addr         200000000
SC Alert: SC Request to send Break to host.
/
ok probe-scsi-all

/pci@1c,600000/scsi@2,1
Target 0
  Unit 0   Removable Device type 8     STK     L20             0214

ok _
```

Note: The target is 0 and the unit 0. So the SCSI value is '0:0'.

- From the boot process:

```
Boot device: /pci@1c,600000/scsi@2/disk@0,0:a  File and args:
SunOS Release 5.10 Version Generic_141444-09 64-bit
Copyright 1983-2009 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.
Hardware watchdog enabled
Configuring devices.
Hostname: dpi51137.ind.hp.com
mchanger1:      found Changer device at tgt0, lun0
mchanger1:      Vendor/Product ID = STK     L20
/dev/rdsk/c1t0d0s3 is clean
/dev/rdsk/c1t0d0s4 is clean
Reading ZFS config: done.

dpi51137.ind.hp.com console login:
```

Note: The STL L20 library is detected on tgt0, lun0. So the SCSI address of the STK L20 library is 0:0.

- From the output of the command `dmesg` after the system is booted:

```
bash-3.00# dmesg

Wed Nov  3 23:46:03 IST 2010
```

```
Nov  3 22:39:19 dpi51137.ind.hp.com mchanger: [ID 902828 kern.notice] mchanger1:        found Changer device at tgt0, lun0
Nov  3 22:39:19 dpi51137.ind.hp.com mchanger: [ID 902828 kern.notice] mchanger1:        Vendor/Product ID = STK     L20
Nov  3 22:39:19 dpi51137.ind.hp.com scsi: [ID 193665 kern.info] mchanger1 at glm1: target 0 lun 0
Nov  3 22:39:19 dpi51137.ind.hp.com genunix: [ID 936769 kern.info] mchanger1 is /pci@1c,600000/scsi@2,1/mchanger@0,0
```

Note: The STSK L20 Library is detected on tgt0, lun0. So the SCSI address of the STK L20 library is 0:0.

Setting the ACSLS user password

Optionally, you can set passwords to prevent a security exposure for the user IDs acsss, acssa, and acsdb.

To set the passwords (optional), use the command `passwd acsss` and supply the new password at the prompt.

If the acsss, acssa, or acsdb user IDs were not defined with their home directories matching the ACSLS installation directory, and the installation script displayed a warning, modify these user IDs so that their home directories are under the ACSLS base directory.

The following commands modify the users' home directories (you must be logged in as root):

```
usermod -d /export/home/ACSSS acsss
usermod -d /export/home/ACSSA acssa
usermod -d /export/home/ascbd ascbd
```

Configuring an ACSLS server with a firewall

This section explains how to configure the ACSLS server to work with existing firewall setup. Configuring the firewall using any application or hardware is left to the choice of the user. ACSLS needs to be configured and defined ports (*default:* 30031) have to be permitted in the existing firewall setup. You can always change the default ports and can use self-defined ports depending upon availability. Make sure that the defined port is specified while configuring ACSLS to work through the firewall.

Configuring the CSI variables

Log in as acsss user and configure the CSI variables, as in the following example:

```
# su – acsss
Sun Microsystems Inc. SunOS 5.9 Generic May 2002

$ acsss_config
ACSLS feature configuration

Please enter the number followed by Return for your choice from the following menu
to configure product behavior in that area.
Press ? followed by the Return key for help.

1: Set CSI tuning variables
2: Set event logging variables
3: Set general product behavior variables
4: Set access control variables
5: Set automatic backup parameters
6: Rebuild Access Control information
7: Event Notification settings
8: Define or Change Library Configuration
E: Exit

Menu choice: 1
```

```
Keep everything as is except for the following variables.
→ Changes to alter the use of the UDP protocol will not take effect until the
product is restarted. CSI support for RPC using the UDP protocol is enabled
[TRUE]: FALSE <return>

Variable: CSI_UDP_RPCSERVICE
→Automatically start CSCI at ACSLS startup (TRUE/FALSE) [FALSE]: TRUE <return>

Variable: START_CSCI_PROCESS
→ Enable CSI to be used behind a firewall (user-defined inbound port)
(TRUE/FALSE) [FALSE]: TRUE <return>

Variable: CSI_FIREWALL_SECURE
False - select False if you do not want the ports on the ACSLS server to be
restricted.
True - select True if you want the ACSLS server to operate behind a secured
firewall.
```

To support ACSLS behind the firewall, make the following changes on the ACS Client:
Changes in the `ssi.sh` script located at `/opt/omni/acs`:

```
#cd /opt/omni/acs
#vi ssi.sh
```

- Edited values:

  `CSI_UDP_RPCSERVICE="TRUE "; export CSI_UDP_RPCSERVICE`

  changed to

  `CSI_UDP_RPCSERVICE="FALSE "; export CSI_UDP_RPCSERVICE`

- Added lines:

  `SSI_INET_PORT=30031; export SSI_INET_PORT`

  `CSI_HOSTPORT=30031; export CSI_HOSTPORT`

  Remember that you need to define the port numbers.

Configuring the library

Log in as acsss user and configure the library, as in the following example:

```
# su – acsss
Sun Microsystems Inc. SunOS 5.10 Generic May 2009

$ acsss_config
ACSLS feature configuration

Please enter the number followed by Return for your choice from the following menu
to configure product behavior in that area.

Press ? followed by the Return key for help.

1: Set CSI tuning variables
2: Set event logging variables
3: Set general product behavior variables
4: Set access control variables
5: Set automatic backup parameters
6: Rebuild Access Control information
7: Event Notification settings
8: Define or Change Library Configuration
E: Exit

Menu choice: 8

lib config.sh 1599: Verifying database environment...
Checking acstable
Checking portable
Checking lsmtable
Checking captable
Checking lockidtable
Checking drivetable
Checking volumetable
Checking celltable
Checking pooltable
Checking audittable
Checking csitable
Checking paneltable
Checking vactable
Checking scr distr table
```

```
Checking displaycommand table
Checking displayfields table
Checking displayoptions table
Checking displayoptval table
Checking displaysubfields table
Checking ptptable
Checking clienttable
Checking handtable
Checking lmutable
...Loading Display database reference tables.

Configure library communications? (y or n):y
Library server data base exists and will be overwritten, continue(y/n)? y

Number of ACSs to be supported: 1
Number of connections to ACS #0: 1
Device or host - ACS #0, connection #0: /dev/mchanger4

Checking defined ports...
```

Note: The operator panel `/dev/mchanger4` is created while installing ACSLS software via `install.sh`. See the example in the section Installing ACSLS software using install.sh on page 5.

Integrating Data Protector

A. Installing a Media Agent

You can either install the General Media Agent or the NDMP Media Agent on systems that will be physically connected to a backup drive in a **StorageTek library** and on the system that will access the **library** robotics through the ACSLS.

Note: You need special licenses, depending on the size of the repository with media or the number of drives and slots used in the StorageTek library. For more information, see the *HP Data Protector Installation and Licensing Guide*.

Prerequisites

- The StorageTek library has to be configured and running. For details of configuring a StorageTek library, see the documentation that comes with the StorageTek library.
- You need the following information before you start installing the Media Agent software:
  - The hostname of the host where ACSLS is running.
  - A list of ACS drive IDs that you want to use with Data Protector. Log in on the host where ACSLS is running and execute the following command to display the list:

    `rlogin "ACSLS hostname" -l acssa`

    Enter the terminal type and wait for the command prompt. At the ACSSA prompt, enter the following command:

    ACSSA> **`query drive all`**

    The format specification of an ACS drive has to be the following:

    `ACS DRIVE: ID:#,#,#,# - (ACS num, LSM num, PANEL, DRIVE)`

  - Make sure that the drives that will be used for Data Protector are in the online state. If a drive is not in the online state, change the state with the following command on the ACSLS host:

    `vary drive drive_id online`

  - A list of available ACS CAP IDs and ACS CAP format specification. Log in on the host where ACSLS is running and execute the following command to display the list:

    `rlogin "ACSLS hostname" -l acssa`

    Enter the terminal type and wait for the command prompt. At the ACSSA prompt, enter the following command:

    ACSSA> **`query cap all`**

    The format specification of an ACS CAP has to be the following:

    `ACS CAP: ID:#,#,# (ACS num, LSM num, CAP num)`

  - Make sure that the CAPs that will be used for Data Protector are in the state online and in the manual operating mode.

    If a CAP is not in the state online, change the state using the following command:

    `vary cap cap_id online`

    If a CAP is not in the manual operating mode, change the mode using the following command:

    `set cap manual cap_id`

  - *On Windows systems:* A list of SCSI addresses for the drives, for example, scsi4:0:1:0.
  - *On UNIX systems:* A list of UNIX device files for the drives.

    Run the `ioscan -fn` system command on your system to display the required information.

Steps

1. Distribute a Media Agent component to clients using the Data Protector GUI and Installation Server for Windows.
2. Start the ACS ssi daemon on all library hosts with access to the robotics on the library.

   On Windows clients:

   Install the LibAttach service. Refer to the ACS documentation for details. Make sure that during the configuration of the LibAttach service you enter the appropriate ACSLS hostname. After a successful

configuration, the LibAttach services are started automatically and will be started automatically after every reboot as well.

Note: After you have installed the LibAttach service, check if the `libattach\bin` directory has been added to the system path automatically. If not, add it manually. For more information on the service, see the documentation that comes with the StorageTek library.

On HP-UX and Solaris clients:

Run the following command:

```
/opt/omni/acs/ssi.sh start ACS_LS_hostname
```

On AIX clients:

Run the following command:

```
/usr/omni/acs/ssi.sh start ACS_LS_hostname
```

3. Run the following command to check whether the library drives are properly connected to your system:

   On Windows clients:

   ```
   Data_Protector_home\bin\devbra -dev
   ```

   On HP-UX and Solaris clients:

   ```
   /opt/omni/lbin/devbra -dev
   ```

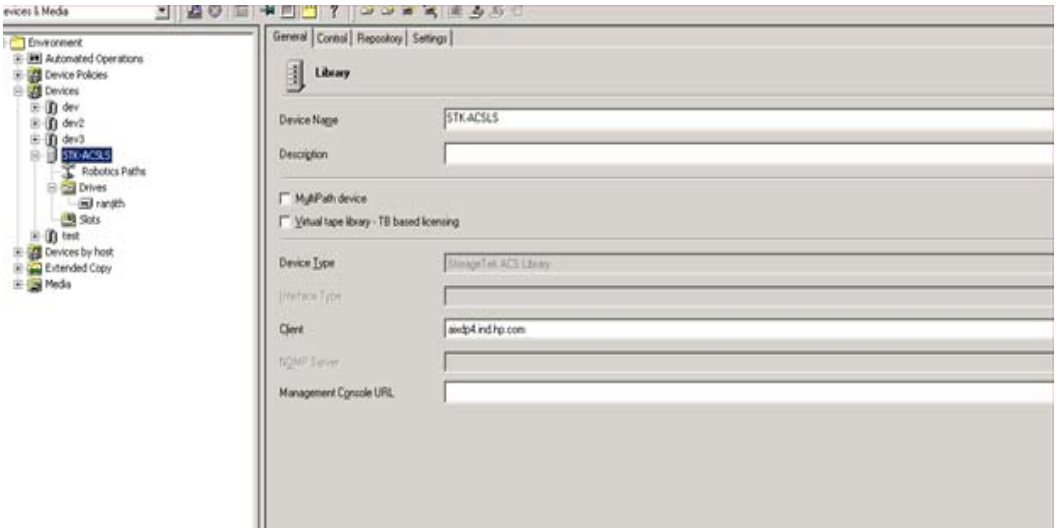
   On AIX clients:

   ```
   /usr/omni/bin/devbra -dev
   ```

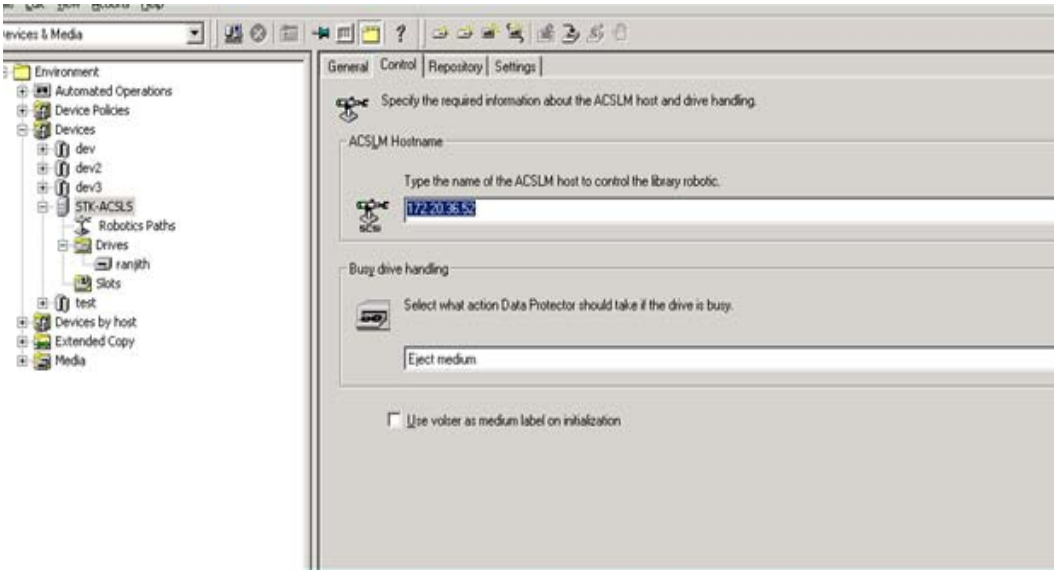
   A list of the library drives with the corresponding device files/SCSI addresses will be displayed.

B. Configure a StorageTek ACS library device

1. In the Context List, click **Devices & Media**.
2. In the Scoping Pane, right-click **Devices** and click **Add Device**.
3. In the Device Name text box, type the name of the device.

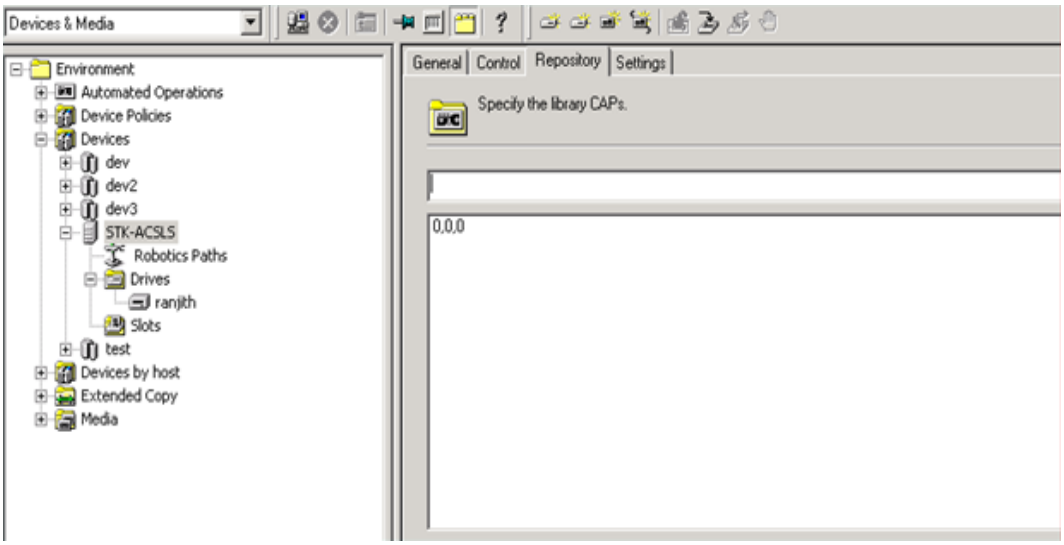


4. In the Description text box, optionally type a description.
5. Optionally, select **MultiPath device**.
6. In the Device Type list, select **StorageTek ACS Library**.
7. If the MultiPath device option is not selected, select the Media Agent client that will access the StorageTek robotics.
8. Optionally, enter a valid URL of the library management console in the **Management Console URL** text box.
9. Click **Next**.
10. In the **ACSLM Hostname** text box, type the hostname of the ACS Server.



For Multipath devices, also select the client name, and add the path to the list of configured paths.

11. In the Busy drive handling list, select the action Data Protector should take if the drive is busy, and then click **Next**.
12. Specify the CAPs for the library and then click **Add**. Click **Next**.

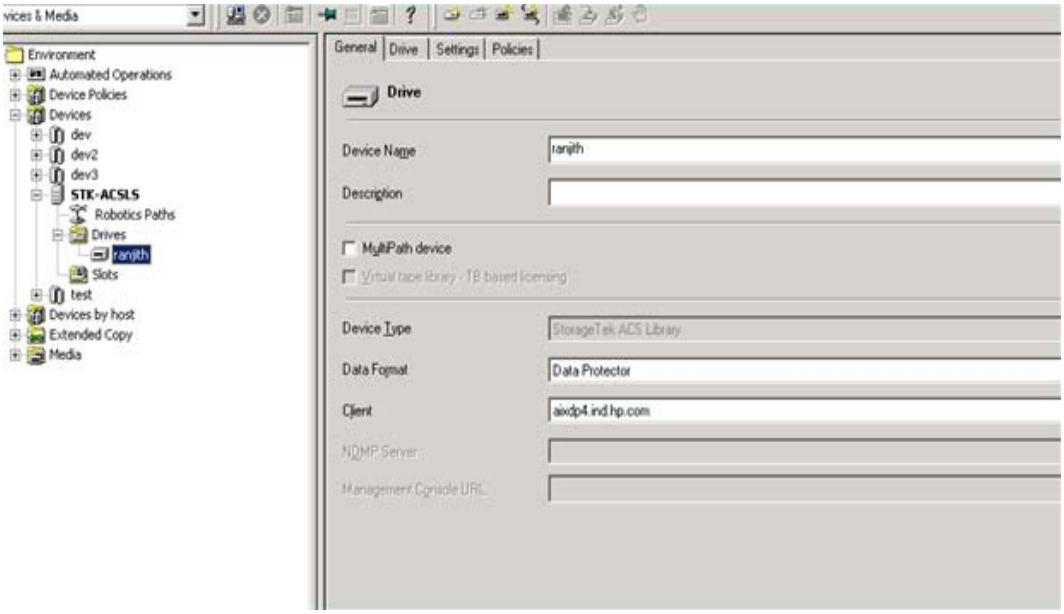


13. In the Media Type list, select the appropriate media type for the device.
14. Click **Finish** to exit the wizard. You are prompted to configure a library drive. Click Yes and the drive configuration wizard displays.

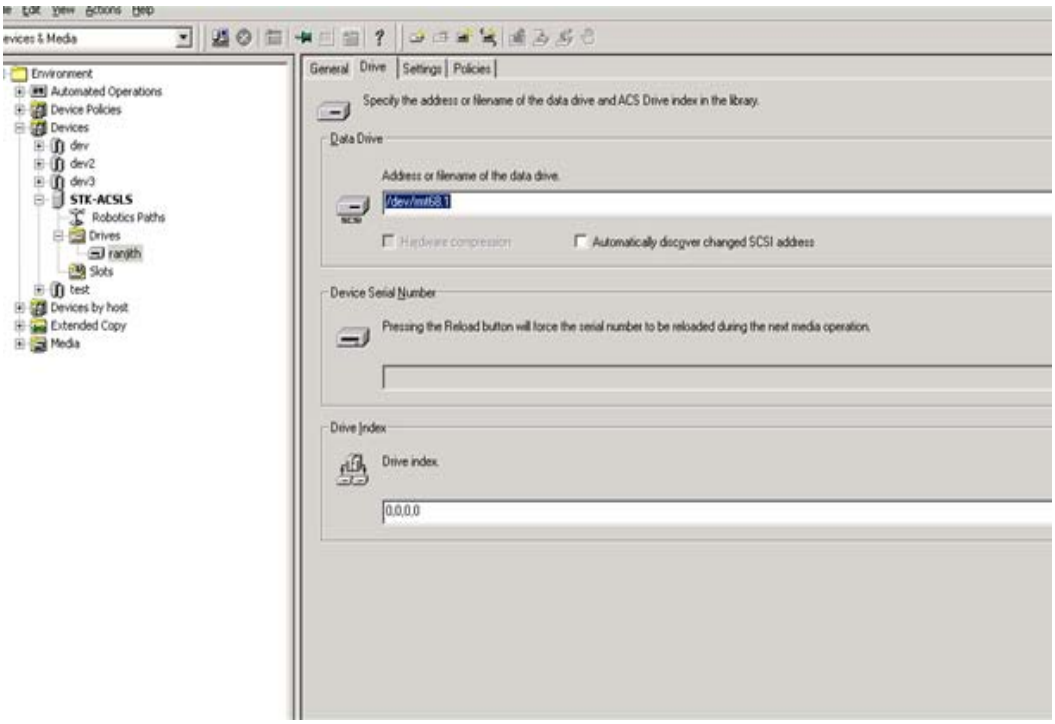
Note: See the *StorageTek ACSLS Installation, Configuration, and Administration* for more detailed information.

C. Configure a drive in the StorageTek ACS library device

1. In the **Device Name** text box, type the name of the drive.

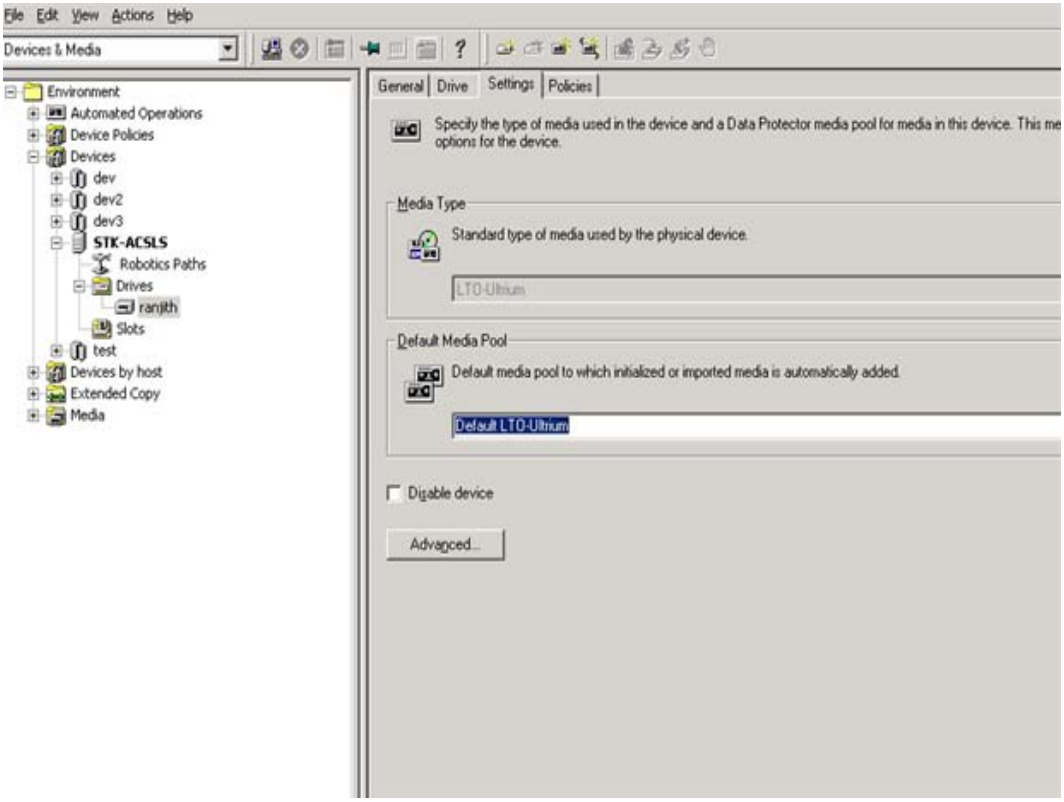


2. In the **Description** text box, optionally type a description.
3. Optionally, select **MultiPath device**.
4. If the MultiPath device option is not selected, select the Media Agent client that will access the StorageTek robotics.
5. Click **Next**.
6. In the **Data Drive** text box, specify the SCSI address of the device.

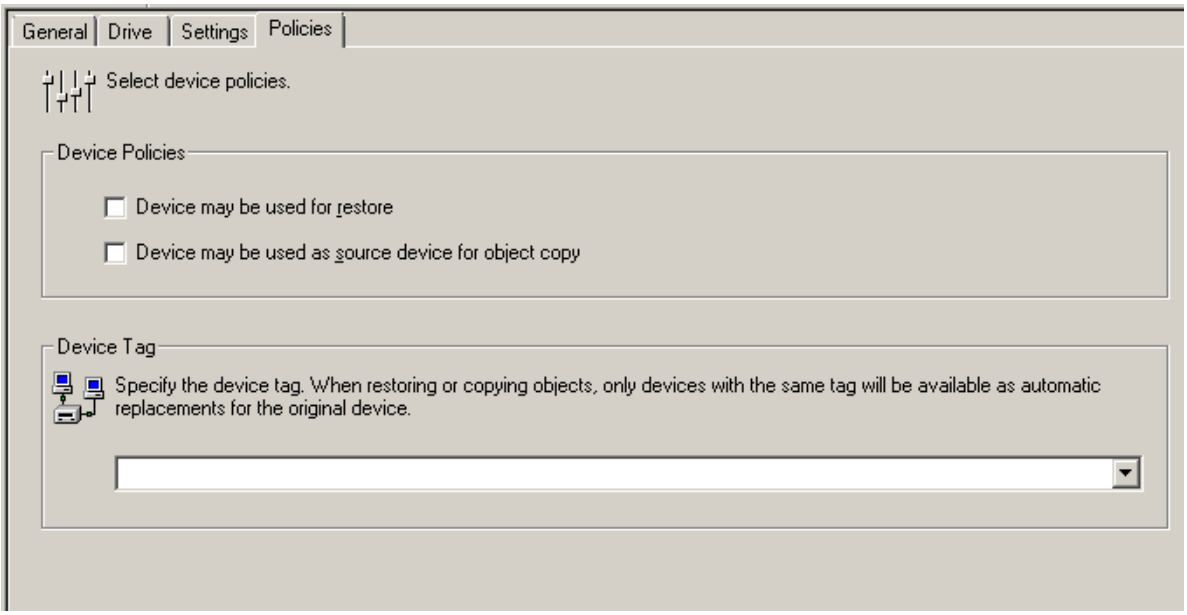


   For multipath devices, select also the Media Agent client that will access the StorageTek robotics and click **Add** to add the path to the list of configured paths.

7. In the **Drive Index** text box, specify the StorageTek drive index you obtained during the installation of a Media Agent. Click **Next**.
8. Select the Default Media Pool for the drive.



9. Click **Advanced** to set advanced options for the drive, such as Concurrency. Click **OK**. Click **Next**.
10. Optionally select **Device may be used for restore**, and/or **Device may be used as source device for object copy**, and specify a **Device Tag**.



11. Click **Finish** to exit the wizard.

Appendix

Communicating with the ACSLM server

The following commands are used to query the ACSLM about the CAP, volumes, drives, LSM and LMU, and to change them from offline to online.

To get the status of the library from the ACSLS server, log in as acsss user. The following sequence shows the commands and their use. They are very basic.

Using ACSSA commands on the ACS library server

1. Log on to the ACSLS Server

   ```
   # su - acsss
   ```

2. At the prompt, enter:

   ```
   $ cmd proc -ql
   ```

3. Wait for the ACSSA> prompt.

You can use the command for the following actions:

- Query the Library Management Unit:

  ```
  ACSSA > q lmu all
  2004-01-28 14 :24:10 LMU Status
  ACS: 0 Mode: SCSI LMU Master Status: Communicating
  Standby Status: -
  Port Port State Role CL Port Name
  0, 0 online - - /dev/mchanger4
  ```

- Query the Cartridge Access Ports:

  ```
  ACSSA > q cap all
  2004-01-28 14:25:30 CAP Status
  Identifier Priority Size State Mode Status
  0, 0,0 0 10 online automatic available
  ```

- Query silos (Library Storage Modules):

  ```
  ACSSA > q lsm all
  2004-01-28 14:26:22 LSM Status
  Identifier State Free Cell Audit Mount Dismount Enter Eject
  Count C/P C/P C/P C/P C/P
  0, 0 online 36 0/0 0/0 0/0 0/0 0/0
  ```

- Query drives:

  ```
  ACSSA > q drive all
  2004-01-28 14:27:34 Drive Status
  Identifier State Status Volume Type
  0, 0, 0, 0 online available DLT7000
  0, 0, 0, 1 online available DLT7000
  0, 0, 0, 2 online available 9840
  0, 0, 0, 3 online available 9840
  ```

- Query volumes:

  ```
  ACSSA > q volume all
  2004-01-28 15:58:36 Volume Status
  Identifier Status Current Location Type
  000002 home 0, 0, 1, 0, 0 STK1R
  000003 home 0, 0, 0, 2, 0 STK1R
  000004 home 0, 0, 0, 3, 0 STK1R
  000005 home 0, 0, 1, 5, 0 STK1R
  000006 home 0, 0, 1, 8, 1 STK1R
  000008 home 0, 0, 0,23, 0 STK1R
  000009 home 0, 0, 1,12, 1 STK1R
  < snip! >
  2004-01-28 15:58:37 Volume Status
  Identifier Status Current Location Type
  000047 home 0, 0, 1, 9, 0 STK1R
  000048 home 0, 0, 1,10, 1 STK1R
  000049 home 0, 0, 0, 7, 0 STK1R
  000050 home 0, 0, 0, 4, 0 STK1R
  FX0023 home 0, 0, 0, 0, 0 SDLT
  ```

- Start request processing:

```
ACSSA > start
Start: ACSLM Request Processing Started: Success.
Vary on LSM
ACSSA > vary lsm
LSM identifier (acs,lsm): 0,0
LSM identifier (acs/lsm):
State(diagnostic/offline/online): online
2004-03-26 11:20:53 107 LSM 0,0: online
ACSSA > LSM 0,0 varied online
Logoff from ACSSA (ACSLS Server interface)
ACSSA > logoff
```

For more details, see the *StorageTek ACSLS Installation, Configuration, and Administration Guide*.

Useful commands in Solaris

- Boot commands:

  These are used from the ok prompt to boot the system using device disk boot disk into different modes

`boot -r`	Performs a reconfiguration reboot.
`boot -s`	Boots to single user level.
`boot -v`	Verbose mode, displaying messages being sent to the log.
`boot -x`	Do not boot in clustered mode (if appropriate).
`boot -a`	Prompt for user input as to which kernel to boot, and so on.

- Alias commands:

`devalias`	Displays all defined aliases.
`devalias alias device-path`	Creates an alias.
`nvalias alias device-path`	Stores a devalias command in non-volatile memory.
`nvunalias alias device-path`	Removes a stored devalias command.

- Configuration variable commands:

`printenv`	Displays all the configuration variables.
`setenv variable value`	Sets variable to value.
`eeprom`	Displays or changes variables when Solaris is running.
`set-defaults`	Resets all variables to their default values.
`set-default variable`	Resets variable to its default value.

- Open boot commands:

`probe-scsi`	Provides details of devices on SCSI buses.
`test device`	Runs device self-test (if available).
`test-all`	Runs all device self-test methods available.
`watch-net`	Tests net device and monitors for bad packets.
`watch-clock`	Tests the real-time clock chip.
`help`	Displays help about OBP commands.
`help category`	Displays help about a category (such as boot system, diag, devalias and so on)
`help command`	Displays help about a command.
`reset-all`	Resets the entire system — similar to a power cycle.
`sync`	Flushes disk buffers to disk.
`eject-floppy`	Eject the floppy.
`power-off`	Powers off the system (similar to Shift + power key).
`go`	Antidote to Stop + A.
`banner`	Displays banner with useful information.
`.speed`	Shows CPU and PCI bus speeds.

`show-sbus`	Displays devices attached to system SBUS.
`.version`	Shows the OBP version.
`idprom`	Displays IDPROM contents formatted.

- Display the device list (and drivers attached to devices):
  `prtconf -D`
- Configure the system:
  `'/usr/platform/','uname –i', 'prtdiag'`

For more information

To read more about Data Protector go to http://www.hp.com/go/dataprotector

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