

# StorageTek Automated Cartridge System Library Software

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Quick Reference

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# Preface

Automated Cartridge System Library Software (ACSL) is Oracle's StorageTek's UNIX server software that controls StorageTek automated tape libraries. The StorageTek ACS family of products consists of fully automated, tape cartridge-based data storage and retrieval systems. StorageTek ACSL supports network access to different client systems that can range from workstations to mainframes to supercomputers running on a variety of operating systems.

This guide is for the individual responsible for administering StorageTek ACSL. It is expected that you already have a working knowledge of the following:

- UNIX file and directory structure
- How to use UNIX commands and utilities for your platform
- UNIX system files
- How to do typical UNIX system administrator tasks, such as logging on as root and setting up user accesses to a UNIX application

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## Quick Reference

Throughout this quick reference, underlines show valid command and keyword abbreviations. For example, `aud` is an abbreviation of the `audit` command. Brackets `[]` enclose optional parameters. A vertical bar ( `|` ) separates parameter choices.

### Start and Stop Commands

The `acsss` command is used to start, stop, and monitor the status of the various services associated with ACSLS.

Command	Function
<code>acsss enable</code>	This is the default method to bring up ACSLS. It checks for dependencies and activates, in the proper order, the five ACSLS services and the ACSLS GUI. When this method is used, the services are configured to restart automatically after a system reboot.
<code>acsss temp-enable</code>	Same as <code>acsss enable</code> but services are not restarted after a system reboot.
<code>acsss maint-enable</code>	Intended for maintenance operations, this option brings up the ACSLS database and the GUI infrastructure. This method is used in contexts of database maintenance ( <code>restore</code> , <code>import</code> , <code>export</code> ), library configuration ( <code>acsss_config</code> ), and minor software patch installations. Neither the <code>acsls</code> nor the <code>smce</code> service are enabled.
<code>acsss disable</code>	This is the default method used to halt ACSLS operation. It is not a complete shutdown and allows for the database and any GUI login sessions to remain active for maintenance operations after the <code>acsls</code> and <code>smce</code> services have been disabled. The resulting state is identical to that of <code>acsss maint-enable</code> . This is the safest method to bring down the server since ACSLS and the library are placed in an idle state before the services are disabled.
<code>acsss force-disable</code>	Same as <code>acsss disable</code> but the operation does not wait for an idle state before disabling <code>acsls</code> and <code>smce</code> .
<code>acsss shutdown</code>	This renders a complete shutdown of all ACSLS services. It is intended for contexts of software installation and de-installation, and other maintenance contexts that require the database ( <code>acsdb</code> ) or the GUI infrastructure ( <code>rmi-registry</code> and <code>surrogate</code> ) to be shutdown.

Command	Function
<code>acsss db</code>	Brings up only <code>acsdb</code> . It shuts down all other services.
<code>acsss status</code>	This option provides a quick status report of the five ACSLS services and the GUI.
<code>acsss g-status</code>	This option displays the status of the ACSLS GUI.
<code>acsss l-status</code>	This option provides a verbose status summary of the five ACSLS services and includes pointers to log data for further analysis in troubleshooting contexts.
<code>acsss p-status</code>	Similar to <code>acsss status</code> , this report includes a listing of the various process id's that are monitored by each respective service contract.
<code>acsss legal</code>	This option displays the ACSLS Legal Notice in English or French.

## Command Identifiers

Each command identifier corresponds to a type and consists of one or more components separated by commas.

<i>acs_id</i>	acs(0-31)
<i>cap_id</i>	acs(0-31),lsm(0-99),cap(0-11) An asterisk (*) in a <i>cap_id</i> does the following:
	acs,lsm,* causes ACSLS to select the highest priority available CAP in the LSM.
	acs,* causes ACSLS to select the highest priority available CAP in the ACS
	* for an enter request causes ACSLS to select the CAP in the ACS with the most free cells.
	* for an eject request causes ACSLS to select the highest priority CAP in each ACS with a volume designated for ejection.
<i>cell_id</i>	acs(0-31),lsm(0-99),panel(0-50),row(0-41),column(0-23)
<i>drive_id</i>	acs(0-31),lsm(0-99),panel(0-50),drive(0-31)
<i>drive_type</i>	Up to 10 characters transport type identifier; can be any combination of numbers (0-9) or letters (A-Z).
<i>lock_id</i>	decimal number (0-32767)
<i>lsm_id</i>	acs(0-31),lsm(0-99)
<i>media_type</i>	Up to 10 characters media type identifier; can be any combination of numbers (0-9) or letters (A-Z). Spaces are not allowed. A common media type is the STK1R.
<i>owner_id</i>	volume owner
<i>panel_id</i>	acs(0-31),lsm(0-99),panel(0-50)
<i>pool_id</i>	decimal number (0-65535) Specifying an asterisk (*) for the <i>pool_id</i> reassigns a volume to its current <i>pool_id</i>
<i>port_id</i>	acs(0-31),port(0-15)
<i>request_id</i>	unique decimal number (0-65535) assigned by the ACSLS.

<i>subpanel_id</i>	acs(0-31),lsm(0-99),panel(0-50),startrow(0-41),startcolumn(0-23),endrow(0-41),endcolumn(0-23)
<i>vol_id</i>	Six-character identifier consisting of any combination of numbers (0-9), letters (A-Z, a-z, or mixed case (except for use in volrpt)), dollar sign (\$), pound sign (#), and leading and/or trailing spaces ( ). Use single or double quotes to enclose <i>vol_ids</i> with leading or trailing spaces. <i>Do not</i> specify <i>vol_ids</i> with embedded spaces.
<i>volrange</i>	Specifies an ascending range of volumes separated by a dash.  For volranges in query, enter, and eject commands:  If it is a numeric range, specify only the right most numeric portions of the <i>vol_ids</i> as the range. All preceding characters <i>must</i> be identical. The display commands support full alphanumeric volranges and allow wildcards '*' and '_'.

## Auditing the Library

Audit the entire library - updates library configuration	<code>audit cap_id server</code>
Audit an ACS	<code>audit cap_id acs acs_id</code>
Audit an LSM	<code>audit cap_id lsm lsm_id</code>
Audit an LSM panel	<code>audit cap_id panel panel_id</code>
Audit an LSM subpanel	<code>audit cap_id subpanel subpanel_id</code>

## Configuration

Run the configuration script	<code>acsss_config</code>
Display values of dynamic options	<code>dv_print</code>
Display values of static options	<code>dv_config -s</code>
Display values of dynamic and static options	<code>dv_config -d</code>

## Configuration - Dynamic

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### ACS

Add a new ACS

```
config acs new
```

Reconfigure an existing ACS

```
config acs acs_id
```

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### Drives

Reconfigure all drives on an existing drive panel. This includes adding drives, updating drive types and serial numbers for existing drives, and deleting drives that were removed from the database.

```
config drive(s) panel_id
```

---

### LSMs

Reconfigure an existing LSM and all its components, which include CAPs and panels.

```
config lsm lsm_id
```

Note: Use `config acs` to add or delete an LSM in an ACS

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### Ports

Reconfigure port connections to an ACS.

```
config port(s) acs_id
```

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# Displaying Status

Display CAP information	<pre>display cap <i>cap_id</i> ... ] [ -availability <i>cap_availability</i> ...] [ -status <i>cap_status</i> ... ] [-priority <i>cap_priority</i> ... ] [ -state <i>cap_state</i> ... ] [ -manual   -automatic ] [ -condition <i>cap_condition</i> ... ] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>
Display cell information	<pre>display cell <i>cell_loc</i> ...[ -status <i>cell_status</i> ... ] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>
Display drive information	<pre>display drive <i>drive_id</i> ... [ -status <i>drive_status</i> ... ] [-state <i>drive_state</i> ... ] [ -type <i>drive_type</i> ... ] [ -volume <i>vol_id</i> ... ] [ -lock <i>lock_id</i>... ] [ -serial <i>drive_serial_num</i> ... ] [ -condition <i>drive_condition</i> ...] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>
Display lock information	<pre>display lock <i>lock_id</i> ... [ -user <i>user_id</i> ... ] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>
Display LSM information	<pre>display lsm <i>lsm_id</i> ... [ -status <i>lsm_status</i> ... ] [-state <i>lsm_state</i> ... ] [ -free_cells <i>cell_count</i>...] [ -type <i>lsm_type</i> ... ] [ -serial <i>lsm_serial_num</i>... ] [ -condition <i>lsm_condition</i> ] [ -door_open   -door_closed ] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>
Display panel information	<pre>display panel <i>panel_id</i> ...[ -type <i>panel_type</i> ... ] [ [ -c ]   [ -f <i>field</i> ... ] [ -s <i>sort_field</i> ... ] [ -n <i>n</i> ] ]</pre>

Display pool information	<pre>display pool pool_id ... [ -low_water low_water_mark ...   -high_water high_water_mark... ] [-overflow   -no_overflow ] [ [ -c ]   [ -f field ... ] [ -s sort_field ... ] [ -n n ] ]</pre>
Display port information	<pre>display port port_id ... [ -online   -offline ] [ - name port_name ... ] [ [ -c ]   [ -f field ... ] [-s sort_field ... ] [ -n n ] ]</pre>
Display volume information	<pre>display volume vol_id ... [ -home acs,lsm,panel,row,column...] [ -drive drive_loc ... ] [-data   -scratch   -clean ] [ -media media_type ... ] [ -pool pool_id... ] [ -standard   -virtual ] [ -status vol_status ... ] [ -entry entry_date ... ] [ -access access_date ... ] [ -lock lock_id ... ] [ [ -c ]   [ -f field ... ] [ -s sort_field ... ] [ -n n ] ] [ -max_use max_use] [ -lock_time lock_time]</pre>

## Maintaining the Database

Export database table data and ACSLS control database files to tape or a file. Use when reinstalling ACSLS or upgrading to a new ACSLS version using the same database.	<pre>db_export.sh -f [ db_file   tape_device ]</pre>
Import database table data and ACSLS control database files from the export tape or file. Use when reinstalling ACSLS or upgrading to a new ACSLS version using the same database.	<pre>db_import.sh -f [ db_file   tape_device ]</pre>
Back up the database	<pre>bdb.acsss -f [ backup_file   tape_device ]</pre>
Bring up the database	<pre>acsss db</pre>
Recover the database after a database failure	<pre>rdb.acsss</pre>

## Managing CAPS

Display CAP status	<u>query</u> <u>cap</u> <u>cap_id</u> ...   <u>all</u> or <u>display</u> <u>cap</u> <u>cap_id</u> ... *
Set CAP's entry mode (manual or automatic)	<u>set</u> <u>cap</u> <u>mode</u> <u>manual</u>   <u>automatic</u> <u>cap_id</u>
Set CAP's automatic selection priority	<u>set</u> <u>cap</u> <u>priority</u> <u>cap_priority</u> <u>cap_id</u>
Make manual mode CAP ready to enter labelled carts	<u>enter</u> <u>cap_id</u>
Make multiple CAPs in an LSM ready	<u>enter</u> <u>lsm_id</u>
Make CAP ready to enter unlabeled carts into library	<u>venter</u> <u>cap_id</u> <u>vol_id</u>

## Managing Dual LMU

Display LMU and port status for both single-LMU and dual-LMU ACS configurations and desired state for ACSs and ports.	<u>query</u> <u>lmu</u> <u>acs_id</u> ...   <u>all</u>
Manually switch ACS management from the ACS's master LMU to the standby LMU	<u>switch</u> <u>lmu</u> <u>acs_id</u>

## Managing Locks

Set your lock ID	<u>set</u> <u>lock</u> <u>lock_id</u>
Display your current lock ID or user ID	<u>show</u> <u>lock</u>   <u>user</u>
Lock a volume or drive (to your current lock ID)	<u>lock</u> <u>drive</u>   <u>volume</u> <u>identifier</u>
Remove active locks (to your current lock ID) on specified drives or volumes or all active locks	<u>unlock</u> <u>drive</u>   <u>volume</u> <u>identifier</u> ...   <u>all</u>
Remove all active and pending locks on specified drives or volumes	<u>clear</u> <u>lock</u> <u>drive</u>   <u>volume</u> <u>identifier</u>

## Managing Logical Libraries

The *lib\_cmd* command-line utility is an alternative to the ACSLS GUI for managing and monitoring resources in ACSLS logical libraries. *lib\_cmd*

<code>lib_cmd assign drive <i>drive_id</i> <i>lib_id</i></code>	Assigns the specified drive to the specified library.
<code>lib_cmd unassign drive <i>lib_id</i> <i>logical_drive_id</i></code>	Removes the specified logical drive from the logical library configuration.
<code>lib_cmd assign volume [ <i>vol_id</i>   <i>vol-range</i> ] <i>lib_id</i></code>	Assigns a volume for exclusive use within a logical library.
<code>lib_cmd assign volume [ <i>vol_id</i>   <i>vol-range</i> ] <i>lib_id</i></code>	Removes a volume from the logical library inventory.
<code>lib_cmd create library <i>lib_name</i> backing_acs cell_capacity drive_capacity</code>	Creates a new logical library.
<code>lib_cmd create mapping <i>initiator_id</i> <i>target_id</i> <i>library_id</i></code>	Establishes an initiator-target (client-server) relationship for the specified library.
<code>lib_cmd edit library <i>lib_id</i> [-n name ] [-c capacity ] [-d <i>drive_slots</i> ] [-f <i>volume_label_format</i> [6 8p 8s all] [-x <i>imp/exp_cell_count</i> ]</code>	Alters the configuration of an existing logical library.
<code>lib_cmd refresh initiator</code>	Retrieves all initiators currently known to ACSLS.
<code>lib_cmd refresh target</code>	Retrieves all targets currently known to ACSLS.
<code>lib_cmd delete initiator <i>initiator_id</i> (y/ n)</code>	Removes the specified initiator from the configuration. Confirmation (y) is required in order to commit the specified deletion.
<code>lib_cmd delete library <i>lib_id</i> (y/n)</code>	Removes the specified logical library from the ACSLS configuration. This creates a cascading delete, disassociating any assigned volumes and drives from the library.
<code>lib_cmd delete mapping <i>lib_id</i> (y/n)</code>	Removes all initiator-target mappings from the specified logical library. The operation disables any current client connections.
<code>lib_cmd delete target <i>target_id</i> (y/n)</code>	Removes the specified target from the configuration. Confirmation (y) is required in order to commit the specified deletion.
<code>lib_cmd display drive [<i>drive_id</i> ] [-p <i>acs_id</i>   all ] [-l <i>lib_id</i>   all ] [-t <i>drive_type</i> ] [-u <i>acs_id</i> ]</code>	Generates a summary of the specified drive or all drives in the specified library.

<code>lib_cmd display initiator</code>	Generates a list of all initiators identified by ACSLS. Each initiator is listed by its world-wide name and the alias name.
<code>lib_cmd display library [-p <i>acs_id</i>   all ]                           [-l <i>lib_id</i>   all ]</code>	Displays the attributes of the requested library ID.
<code>lib_cmd display mapping [ <i>lib_id</i>   all ]</code>	Generates a list of initiator-target mappings for each library ID (or all libraries).
<code>lib_cmd display target</code>	Generates a list of all targets identified by ACSLS
<code>lib_cmd display volume [ <i>vol_id</i> ]   vol-range]                           [-p <i>acs_id</i>   all ]                           [-l <i>lib_id</i>   all ]                           [-u <i>acs_id</i>]</code>	Generates summary information for the specified volume or volume set.
<code>lib_cmd vary library <i>lib_id</i>                       [online offline diagnostic]</code>	Changes the desired state of the logical drive to the specified (online, offline, diagnostic) state.
<code>lib_cmd vary library <i>lib_id drive_id</i>                       [online offline diagnostic]</code>	Changes the desired state of the logical library to the specified (online, offline, diagnostic) state.

## Managing Scratch Pools/Volumes

Create or modify scratch pools	<code>define pool low_water_mark high_water_mark pool_id ... [overflow]</code>
Display scratch pool attributes	<code>query pool pool_id ...   all</code>
Display the status of scratch volumes in a pool	<code>query scratch pool_id ...   all</code>
Set volume's scratch attribute and assign the volume to a scratch pool	<code>set scratch pool_id vol_id   volrange</code>
Change volume from scratch to data	<code>set scratch off pool_id vol_id   volrange</code>
Delete an empty scratch pool	<code>delete pool pool_id ...   all</code>
Mount a scratch volume from a specified pool (single media libraries)	<code>mount * drive_id pool_id</code>
Mount a scratch volume from the common pool (single media libraries)	<code>mount * drive_id</code>
Mount a scratch volume from a specified pool with specific media type	<code>mount * drive_id pool_id media media_type</code>
Mount a scratch volume from a specific pool, media type based on scratch preferences defined	<code>mount * drive_id pool_id media *</code>
Mount a scratch volume from common pool, media type based on defined scratch preferences	<code>mount * drive_id media *</code>
Mount a scratch volume from common pool with specified media type	<code>mount * drive_id media media_type</code>

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Display scratch pool information for a specific pool or for all pools	<code><u>display</u> pool <i>pool_id</i> ...   *</code>
-----------------------------------------------------------------------------	---------------------------------------------------------

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Review pre-defined policies for volumes that are:	<code>watch_vols [start stop]</code>
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- newly entered
  - discovered by audit or  
cartridge recovery
  - re-activated by audit,  
cartridge recovery, or an  
enter
- 

Display status of media- compatible transports for a specified scratch pool (or volume media type within the pool)	<code><u>query</u> <u>mount</u> * <i>pool_id</i> ... [<u>media</u> <i>media_type</i>   <u>media</u> *]</code>
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## Managing Volumes

Mount a data volume or cleaning cartridge	<code>mount vol_id drive_id [bypass] [readonly]</code>
Dismount a data volume or cleaning cartridge	<code>dismount vol_id drive_id [force]</code>
Create a volume report	<code>volrpt [-s vol   loc   use] [-d] [-f filename] [-z] [-a   -l   -v identifier_list]</code>
Use Display for dynamic reporting of library components and/or volumes.	See Display commands.
Set volume ownership	<code>set owner owner_id volume vol_id   volrange</code>
Eject volumes from the library	<code>eject cap_id vol_id   volrange ...</code>
Move volumes to a specified LSM	<code>move vol_id lsm_id</code>
Delete a volume in an offline LSM	<code>del_vol [-n] [-d] [-f] [-q] vol_id</code>
Move multiple cartridges to one or more LSMs.	<code>moving.sh -f vol_list_file -t lsm_id...</code>
Set cleaning cartridge attributes	<code>set clean max_usage   vol_id   volrange</code>
Set cleaning attributes back to data cartridges	<code>set clean off vol_id   volrange</code>
Display volume information for cleaning cartridges	<code>display volume vol_id   vol_range   *-clean</code>
Display volume end of warranty and end of life percentages, sorted by end of life	<code>display volume * [-media media type] -f media end_of_life warranty_life -s end_of_life</code>

## Query Status

ACSLs and library status	<code>query server</code>
ACS status	<code>query acs acs_id ...   all</code>
LSM status	<code>query lsm lsm_id ...   all</code>
CAP status	<code>query cap cap_id ...   all</code>
Transport status	<code>query drive drive_id ...   all</code>
LMU and port status for both single-LMU and dual-LMU ACS configurations	<code>query lmu acs_id ...   all</code>
Media-compatible transports for a specified data volume	<code>query mount vol_id</code>
Media-compatible transports for a specified scratch pool (or volume media type within the pool)	<code>query mount * pool_id ... [ media media_type   media *]</code>
Port status	<code>query port port_id ....   all</code>



Location of a volume	<code>query volume vol_id ...   all</code>
Cleaning cartridge status	<code>query clean vol_id ...   all</code>
Scratch volumes in a pool	<code>query scratch pool_id ...   all</code>
Scratch pool attributes	<code>query pool pool_id ...   all</code>
Request status	<code>query request request_id ...   all</code>
Display the lock status of a transport or volume	<code>query lock drive   volume identifier ...   all</code>
Display cleaning cartridge attributes	<code>query clean vol_id...   all</code>
Monitor and manage the free cells in libraries managed by ACSLS	<code>free_cell.sh</code>
Display license key information	<code>get_license.sh</code>

## Varying Library Components

Change the desired state and the state of an ACS	<code>vary acs acs_id ... online   offline   diagnostic [force]</code>
Change the state of an LSM	<code>vary lsm lsm_id ... online   offline   diagnostic [force]</code>
Change the state of a CAP	<code>vary cap cap_id ... online   offline   diagnostic [force]</code>
Change the state of a transport	<code>vary drive drive_id ... online   offline   diagnostic [force]</code>
Change the desired state and the state of a port	<code>vary port _port_id ... online   offline</code>

