Shared Virtual Array Administrator

Version 3.1.0

for Linux

Installation Guide

Part Number: 313484203

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Third Edition (Rev C), February 2003. EC 128687.

This edition applies to Version 3.1.0 of the Shared Virtual Array Administrator for Linux product and to all subsequent modifications of that program until otherwise indicated in new editions or revision pages. If there are changes in the program or improvements in the information about the program, this document will be revised and reissued.

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Contents

Preface

This book describes how to install the Shared Virtual Array Administrator for Linux (referred to as "SVAA"). SVAA provides configuration and administration functions for the StorageTek Shared Virtual Array (SVA). The instructions in this book apply to both new SVA installations as well as existing SVA installations to which you are connecting a new SVAA server.

Who Should Read This Book

This book is for system administrators responsible for installation and configuration of SVAA for Linux. This book assumes that you are familiar with Linux system administration.

Conventions

The following typographic conventions are used in this book for showing command syntax and examples.

Table 0-1 Typographic conventions for commands and examples.

Typeface or symbol	**Meaning**	**Example**
`AaBb123`	Name of command, reserved keywords, mandatory punctuation.	`querysubsystem`
AaBb123	Variable placeholder, to be replaced with a real name or value.	`formary -subsys` *subsys_name*
`[ ]`	Square brackets contain arguments that are optional.	`dropconnection [-force]`
`|`	The pipe separates arguments, only one of which may be used at a time.	`-ckdrw yes|no`
`...`	The ellipsis indicates that a parameter supports either a list or a range of values.	`-dmod` *u.t.s* `...`
,	The comma indicates that the parameter supports only a list of values (no ranges).	`-aryid` *array_id*`[,`*array_id*`]`
:	The colon indicates that the parameter supports only a range of values (no lists).	`-dates` *startdate*`[:`*enddate*`]`
`system%`	Indicates the UNIX system prompt.	`system% sibadmin`
`SIB>`	Indicates the SVAA CLI shell prompt.	`SIB> formaray -subsys ABC1`

Shared Virtual Array Documentation

This section lists software and hardware documentation for the Shared Virtual Array products.

How to Obtain Software Documentation

All of the Shared Virtual Array software publications are available from the following sources:

- On the "Software Publications" CD-ROM (part number 3134524*nn*). To order a copy, contact StorageTek Publication Sales and Service at 800-436-5554 or send a fax to 303-661-7367.
- Online (for viewing and printing), at the StorageTek Customer Resource Center (CRC) website at: `www.support.storagetek.com`. To access the SVAA publications, use the following steps:

  a. Log in.

  Note: Logging in requires a customer login ID and password which can be obtained by calling StorageTek Customer Support at 800-678-4430.

  b. Click on **Product Information**.

  c. Click on **Current Products**.

  d. Choose **Software** from the drop-down menu, and click **Next**.

  e. Under the "Software" heading, click on **SVA Administrator (SVAA)**.

  The SVAA publications are available under the "Manuals and Guides" heading. Click **View All** to see the complete list.

SVA Administrator for Linux Library

- *Shared Virtual Array Administrator for Linux Command Quick Reference*
- *Shared Virtual Array Administrator for Linux Installation Guide*
- *Shared Virtual Array Administrator for Linux Messages*
- *Shared Virtual Array Administrator for Linux Quick Start Guide*
- *Shared Virtual Array Administrator for Linux User's Guide*

Related SVA Software Publications

SVA Console for Windows NT (SVAC):

- *Shared Virtual Array Console for Windows NT Quick Start Guide*

For any StorageTek software:

- *Requesting Help from Software Support*

SVA Hardware Publications

Shared Virtual Array hardware publications are available from the following sources:

- On the "SVA Hardware Publications" CD-ROM (part number 3118447*nn*). To order a copy, contact StorageTek Publication Sales and Service at 800-436-5554 or send a fax to 303-661-7367.
- Online (for viewing and printing), at the StorageTek Customer Resource Center (CRC) website at: `www.support.storagetek.com`. To access the Shared Virtual Array publications, use the following steps:

  a. Log in.

  Note: Logging in requires a customer login ID and password which can be obtained by calling StorageTek Customer Support at 800-678-4430.

  b. Click on **Product Information**.

  c. Click on **Current Products**.

  d. Choose **Disk** from the drop-down menu, and click **Next**.

  e. Under the "Disk Systems" heading, click on the Shared Virtual Array product you are using (for example, V2X SVA or 9500 SVA).

  The SVA publications are available under the "Manuals and Guides" heading. Click **View All** to see the complete list.

The V2X Shared Virtual Array (SVA) library consists of:

- V2X *Shared Virtual Array General Information*
- V2X *Shared Virtual Array Installation and Maintenance*
- V2X *Shared Virtual Array Introduction*
- V2X *Shared Virtual Array Operations and Recovery*
- V2X *Shared Virtual Array Planning*
- V2X *Shared Virtual Array Reference*
- V2X *Shared Virtual Array System Assurance*
- *Peer to Peer Remote Copy Configuration Guide*

The V960 Shared Virtual Array (SVA) library consists of:

- V960 *Shared Virtual Array General Information*

- V960 *Shared Virtual Array Installation and Maintenance*
- V960 *Shared Virtual Array Introduction*
- V960 *Shared Virtual Array Operations and Recovery*
- V960 *Shared Virtual Array Planning*
- V960 *Shared Virtual Array Reference*
- V960 *Shared Virtual Array System Assurance*
- *Peer to Peer Remote Copy Configuration Guide*

The 9500 Shared Virtual Array (SVA) library consists of:

- *9500 Shared Virtual Array General Information*
- *9500 Shared Virtual Array Installation*
- *9500 Shared Virtual Array Introduction*
- *9500 Shared Virtual Array Maintenance*
- *9500 Shared Virtual Array Operation and Recovery*
- *9500 Shared Virtual Array Planning, Implementation, and Usage*
- *9500 Shared Virtual Array Reference*
- *9500 Shared Virtual Array System Assurance*
- *Peer to Peer Remote Copy Configuration*

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Summary of Changes

Third Edition (Rev C) February 2003

This edition includes the following changes:

- Updated SVA subsystem microcode level requirements. See "Verify Minimum System Requirements," on page 1.
- Updated "Configure the SVAA Server," on page 11for new prompts supporting the SVAA Web-based interface.

Second Edition (Rev B) September 2002

This edition includes the following changes:

- Updated V2X microcode level requirements.
- Added V2X documents to the "SVA Hardware Publications" section.
- Updated instructions in "Preface" for obtaining product documentation from the StorageTek Customer Resource Center (CRC).

First Edition (Rev A) February 2002

Initial publication.

Chapter 1. Pre-installation

You should perform the following pre-installation tasks to ensure that your site is ready for installation of the Shared Virtual Array Administrator (SVAA) for Linux.

Verify Minimum System Requirements

Before beginning the installation, you should verify that your site meets the following minimum requirements.

Host hardware:	250MHz Intel-compatible processor with 128MB memory.
Host software:	• RedHat 7.1 • Linux Kernel level: 2.4.2, plus a StorageTek-supplied kernel patch • Runtime library level: glibc 2.2+
Host disk space:	15MB free space in the directory where the SVAA server will be installed.
SVA subsystem microcode:	• For 9500 subsystems, E02.04.15.00 or higher. • For V960 subsystems, A01.02.24.00 or higher. • For V2X subsystems, B01.02.00.00 or higher. For information on the most current microcode level, see the StorageTek Customer Resource Center (CRC) website at: `www.support.storagetek.com`.

Verify SVA Subsystem Readiness

Perform the following procedure at the SVA subsystem LOP (local operator panel) to verify that the subsystem is ready for SVAA installation.

Note: If any of the following steps do not verify readiness, refer to the *Shared Virtual Array Installation* guide for instructions on setting up the Shared Virtual Array (SVA) subsystem hardware correctly.

1. Perform the following steps to verify that at least one ICF card in the SVA subsystem has been configured for fibre:

    a. From the Subsystem Main Menu, press F6, Configuration/Drain Menu.

    b. Press F7, Configure Interface Menu.

c. Verify that the ICF card you to want to dedicate to fibre shows a “2” (fibre) in the “Type” column.

d. Press F3 until you return to the Subsystem Main Menu.

2. Use the following steps to verify that the SVA subsystem has been assigned a name:

   a. From the Main Menu, press F5, Information/Status.

   b. Press F5, Subsystem Configuration Status.

   c. On the Subsystem Status screen, verify that an alphanumeric name is displayed in the “Subsystem Name” field.

   d. Press F3 until you return to the Subsystem Main Menu.

3. Use the following steps to verify that at least one Production array has been formed:

   a. From the Main Menu, press F6, Configuration/Drain Menu.

   b. Press F5, Configure Subsystem Menu.

   c. Press F8, Partition Status Array Status.

   d. Verify that at least one array has been defined for the Production partition.

   e. Press F3 until you return to the Subsystem Main Menu.

4. Use the following steps to verify that at least one privileged ECAM device has been assigned:

   a. From the Main Menu, press F6 Configuration/Drain Menu.

   b. Press F5, Configure Subsystem Menu.

   c. Press F7, Functional Device Configuration.

   d. Verify that at least one 3390-3 or 3390-9 type device displays a “Y” in the “Priv” column.

      Note: On the SVAA server, 3390-3 devices are identified as SCSIA, and 3390-9 devices are identified as SCSIB, if those devices have been defined as SCSI on the LOP.

   e. Press F3 until you return to the Subsystem Main Menu.

Verify Linux Host Hardware Readiness

Perform the following procedure on the Linux host hardware to verify that it is ready for SVAA installation.

Verify Hardware Configuration

Use the following steps to verify the devices you want to be able to access from the Linux operating system.

1. Determine which LUNs (logical unit numbers) you want to be able to access on the SVA now and in the forseeable future.
2. Verify with your hardware administrator which ICF cards are being used to attach the Linux host to the SVA subsystem.
3. When the host bus adapter (HBA) driver was installed, the host should have been configured to access functional devices on the SVA. Verify with your hardware administrator that the configuration is correct.

Label the Devices

Use the following steps to verify and label the new devices on the Linux host.

Note: Refer to your Linux system administrator documentation for detailed instructions on using the commands.

1. Log in as `root`, if you haven't already.
2. Open a console or terminal window, if you haven't already.
3. Display all the SCSI devices the host recognizes:

   ```
   # cat /proc/scsi/scsi
   ```

   The display appears something like the following example:

```
Attached devices:
Host: scsi2 Channel: 00 Id: 01 Lun: 00
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
Host: scsi2 Channel: 00 Id: 01 Lun: 01
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
Host: scsi2 Channel: 00 Id: 01 Lun: 02
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
Host: scsi2 Channel: 00 Id: 01 Lun: 03
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
Host: scsi2 Channel: 00 Id: 01 Lun: 04
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
Host: scsi2 Channel: 00 Id: 01 Lun: 05
  Vendor: STK      Model: 9500            Rev: 0927
  Type:   Direct-Access                   ANSI SCSI revision: 03
```

4. Verify that the new devices you have defined are included in the display. They are identified with a type of STK-9500-*nnnn*.
5. Display all the SCSI disk devices the host recognizes:

```
# cat /proc/partitions | egrep ' sd[a-z]+ '
```

The display appears something like the following example:

```
8     0    8891620 sda ...
8    16    8891620 sdb ...
8    32    8891620 sdc ...
8    48    8891620 sdd ...
8    64    8891620 sde ...
8    80    8891620 sdf ...
8    96    8891620 sdg ...
8   112    8891620 sdh ...
```

The output may vary based on the level of the Linux kernel, but the first four columns should always be available and have the format shown above. Every "sd*x*" entry has a corresponding entry in the `/proc/scsi/scsi` file displayed in step 3.

6. Write down the identifier (sd*x*) of the new device(s).

   Note: Keep this information handy, as you will need it later when you define the device as an ECAM device.

7. Label each new device using the following steps.

   a. Start the `fdisk` utility:

```
# fdisk /dev/sdx

Device contains neither a valid DOS partition table, nor Sun, SGI or OSF
disklabel
Building a new DOS disklabel. Changes will remain in memory only, until you
decide to write them. After that, of course, the previous content won't be
recoverable.

The number of cylinders for this disk is set to 1106.
There is nothing wrong with that, but this is larger than 1024, and could in
certain setups cause problems with:
1) software that runs at boot time (e.g., old versions
   of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)
```

   b. Add a new primary partition:

```
Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-1106, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-1106, default 1106):
Using default value 1106
```

   c. Print the partition table:

```
Command (m for help): p
```

```
Disk /dev/sdh: 255 heads, 63 sectors, 1106 cylinders
Units = cylinders of 16065 * 512 bytes

   Device Boot    Start     End    Blocks   Id  System
/dev/sdh1             1    1106   8883913+  83  Linux
```

d. Write the partition table to disk and exit the `fdisk` utility:

```
Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional information.
Syncing disks.
```

Patch the Linux Kernel for SVA Usage

The StorageTek-supplied Linux kernel patch fixes a bug in the Linux kernel and also modifies the kernel timeout value as specified in the *V960 Shared Virtual Array Planning* guide. Use the following procedure to install the kernel patch.

Note: When the RedHat system was installed, the source for the kernel may also have been installed. If it was not, you must install it from the Linux CD-ROM before continuing.

1. Login as `root` to the host system where the SVAA software will be installed.
2. Copy the `bin/SVA_2.4.2.patch` file from the SVAA software CD-ROM to the `/usr/src/` directory:

   ```
   cp cdrom_dir/bin/SVA_2.4.2.patch /usr/src
   ```

3. Change to the `/usr/src` directory:

   ```
   cd /usr/src
   ```

4. Copy the kernel source tree:

   ```
   cp -rp linux-2.4.2 linux-2.4.2.orig
   ```

   Note: If for some reason the `linux-2.4.2/` directory has been renamed, you must name it back to `linux-2.4.2/` for this patch process.

5. Install the kernel patch:

   ```
   patch -p0 < SVA_2.4.2.patch
   ```

   Note: This command installs patches against the `linux-2.4.2/` directory only, so you must make sure the directory exists.

6. Change the kernel to reflect your hardware configuration. Use one of the following methods to ensure that SVAA for Linux works with the custom kernel.

– If you are comfortable editing the kernel's `.config` file directly, make the following modifications:

```
CONFIG_SCSI=y
CONFIG_BLK_DEV_SD=y
CONFIG_SD_EXTRA_DEVS=256
CONFIG_SCSI_MULTI_LUN=y
CONFIG_CHR_DEV_SG=y
CONFIG_SCSI_QLOGIC_FC=y
```

– If you would prefer to use the `make` utility to configure the kernel options, perform the following steps:

  • Change to the kernel source directory:

    ```
    cd /usr/src/linux-2.4.2
    ```

  • Start the `make` utility:

    ```
    make menuconfig
    -OR-
    make xconfig
    ```

  • Select "SCSI support".

    Increase the "Maximum number of SCSI disks that can be loaded as modules" to 256.

    Enable "Probe all SCSI LUNs" on each device.

    Go back (select EXIT) one level.

  • Select "SCSI low-level driver".

    Enable "Qlogic ISP FC SCSI support".

  Note: Do <u>not</u> enable "Qlogic QLA 2100 FC SCSI support".

7. Build the kernel following your normal process (for example, `make dep`; `make bzlilo`).

8. Create a `LILO` entry (`/etc/lilo.conf`) to point to the newly created kernel files (that is, `/vmlinuz` and `/System.map`).

9. Run `lilo` and reboot the system with the new kernel.

The Linux host is now ready for the SVAA server installation.

Although not required for SVAA server installation, at this point you can use your standard methods to initialize and mount the devices to allow them to be used for data storage. See your Linux system administrator documentation for detailed instructions on performing these functions.

Chapter 2. Installation

Note: SnapShot is automatically installed with SVAA for Linux V3.1.0.

Verify Free Space

In order to complete the installation, you must have the following amount of free space on the Linux host:

- At least 15MB of free space in the file system where you plan to install the SVAA server software (`/opt/storagetek/SVAA3.1.0` is the default directory).
- For a graphical installation, at least 20MB of free space on the mount point defined as `TEMP`. If you have not defined `TEMP`, the Install Shield uses the directory `/usr/tmp` (in which case, you must have at least 20MB of free space on `/usr/tmp`). A graphical installation also requires X Windows; see "Installation Modes" for details.
- For a text-only installation, `TEMP` is not used.

Installation Modes

The SVAA V3.1.0 installation can run in two modes: graphical or text-only. The mode is automatically determined based on the presence of the X Windows manager and how your `DISPLAY` environment variable is set. Essentially, the installation is designed to run in graphical mode if the machine to which you are installing SVAA is X Windows-capable, and in text-only mode if the machine is not X Windows capable.

Some details:

- If `DISPLAY` (where the X Windows display will be routed/displayed) is set correctly on your machine, then graphical mode is executed.
- If `DISPLAY` is not set on your machine, then your terminal is assumed to be non-graphics capable, and text-only mode is executed.
- If `DISPLAY` is not set correctly on your machine (that is, your terminal does not match what is specified by `DISPLAY`), then text-only mode is executed.
- If you are using a dummy terminal, in order for text-only mode to execute flawlessly, you must make sure that the `TERM` environment variable is set to match your monitor type and no `DISPLAY` variable is set.

Regardless of mode, the installation outcome is exactly the same; that is, the same files are installed to the same locations.

Graphical Installation

Use the following steps to use the graphical mode to install the SVAA server files on the Linux host. See “Text-only Installation,” on page 9 for the text-only mode.

1. In an X Windows terminal, log in as `root`.
2. Insert the SVAA software CD-ROM in the drive.
3. If the Volume Manager is installed, it displays the contents of your CD-ROM. Close this window.
4. Open a console or terminal window.
5. Change to your CD-ROM:

   `# cd` *cdrom_dir*

   Where *cdrom_dir* is the full pathname of your CD-ROM (such as `/cdrom` or `/cdrom0`).
6. Start the installation:

   ```
   # ./install
   ```
7. The installation script begins. It displays some messages as it determines your display capabilities, then some extraction notices which you can ignore.

   Then the Install Shield begins. Depending on your X Windows configuration, it may display a warning message having to do with fonts; you can ignore this.
8. On the StorageTek splash screen, click Next.
9. On the Welcome screen, read the information and click Next.
10. On the README Information screen, read the information and click Next.
11. On the Choose Destination Directory screen, you can accept the default installation directory (`/opt/storagetek/SVAA3.1.0`), or you can enter the full pathname of a different one. Then click Install.

    Note: If you enter a different directory (including one that is NFS-mounted), `root` must have read/write access to it.
12. If the installation directory does not already exist, you are prompted to confirm its creation. Click Yes.
13. On the Installation Complete screen, click Finish.
14. Remove the CD-ROM from the drive.

The installation is now complete. See “Configure the SVAA Server,” on page 11 for instructions on running the `sibconfig` utility to configure the SVAA server.

Text-only Installation

Use the following steps to use the text-only mode to install the SVAA server files on the Linux host. See “Graphical Installation,” on page 8 for the graphical mode.

Note: If for some reason you have an X Windows-capable machine but want to run the installation in text-only mode, you can force text-only mode by unsetting the `DISPLAY` variable and setting the `TERM` variable to a dummy terminal (`VT100` or equivalent). See “Installation Modes,” on page 7 for details.

1. Log in as `root`.
2. Insert the SVAA software CD-ROM in the drive.
3. Change to your CD-ROM:

   `# cd` *cdrom_dir*

   Where *cdrom_dir* is the full pathname of your CD-ROM (such as `/cdrom` or `/cdrom0`).
4. Start the installation:

   ```
   # ./install
   ```
5. The installation script begins. It displays some messages as it determines your display capabilities.
6. Answer the prompts as instructed below:

   a.
   ```
   Please hit enter to view README file.
   Use ‘f’, ‘b’ and ‘q’ to forward, rewind and quit the
   README file respectively...
   ?
   ```

   Press Enter to view the README file which contains important information regarding the SVAA 3.1.0 installation. The file will be displayed through the `more` command.

   When the file reaches the end, or you enter `q`, the following message appears.

   b.
   ```
   If you did not get to read all parts of the README
   file, then manually view the
   cdrom_dir/README_SVAA_Linux file.

   Please hit enter to start the actual installation
   process ...
   ?
   ```

   Press Enter to continue with the installation. You can either view the README file on the CD-ROM after the installation is complete, or if you want to view the file now, you can press Ctl-C to exit the installation (you will need to return to Step 4 to restart the installation when you are done with the file).

c. SVAA for Linux installation directory
Default: /opt/storagetek/SVAA3.1.0
Type path or hit enter for default
?

Specify the directory to which you want to install the SVAA server software. Press Enter to accept the default (/opt/storagetek/SVAA3.1.0), or enter the full pathname of a different directory and press Enter.

If the directory does not exist you will see the following message as the directory is created:

```
Directory does not exist. Creating directory.
```

If the directory does already exist you will see the following prompt:

```
Warning: install_dir directory already exists
Do you still want to continue [(y)es/(n)o]
Default: (n)o
?
```

Press y to overlay the SVAA server software on top of the existing directory. Press n or Enter to exit the installation script (you will need to return to Step 4 to restart the installation).

d. You will see the following messages as the software is installed:

```
Preparing to untar files to install_dir ...

file1
file2
...
filen
........

Setting up JRE ...

Installation of SVAA for Linux is now complete
(assuming, no abnormal termination occurred).

If successful, then please "cd install_dir/bin"
and run ./sibconfig to configure your SVAA server
or refer to the user manual for more details.
```

7. Remove the CD-ROM from the drive.

The installation is now complete. See "Configure the SVAA Server," on page 11 for instructions on running the sibconfig utility to configure the SVAA server.

Install Necessary Patch(es)

Before continuing to the next procedure, you should install the latest SVAA for Linux patch level. To do so, access the StorageTek Customer Resource Center (CRC) website at www.support.storagetek.com and download any necessary patches, then install them according to the given instructions.

Configure the SVAA Server

Use the following steps to configure the SVAA server for your installation.

1. In a terminal or console window, change to the installation directory:

   ```
   # cd install_dir
   ```

   By default, *install_dir* is `/opt/storagetek/SVAA3.1.0`.

2. Start the configuration utility:

   ```
   # cd bin
   # ./sibconfig
   ```

3. Answer the prompts as instructed below:

   a.
   ```
   Enter Unique Name for SVAA Server:
   Default: Server 31
   Type name or hit enter for default
   ?
   ```

   Each SVAA server must have a unique name. The default is: `Server31` The following characters are accepted, even as the first one: a to z, A to Z, 0 to 9, $, @, #, -, _, +, &, ., and /.

   Note: You must not have two SVAA servers with the same name, even if they are running on different hardware platforms, as this can have unpredictable results.

   b.
   ```
   Enter Pathname for SVAA:
   Default: /opt/storagetek/SVAA3.1.0
   Type path or hit enter for default
   ?
   ```

   This is the SVAA installation directory. The default is: `/opt/storagetek/SVAA3.1.0`.

   Enter a full pathname, or press Enter to accept the default.

   c.
   ```
   Enter Location where Configuration File Stored:
   Default: /opt/storagetek/SVAA3.1.0/Server31/
   Type path or hit enter for default
   ?
   ```

   This is the location where the SVAA server's `config.dat` file will be stored. This file contains the answers to the questions asked by this utility, as well as other configuration information. (Refer to the *SVAA for Linux User's Guide* for a complete explanation of the `config.dat` file.) The default is */install_dir/server_name/* (for example, `/opt/storagetek/SVAA3.1.0/Server31/`).

   Enter a full pathname, or press Enter to accept the default.

   Note: If you will be running multiple SVAA servers on this host, each server must have its own `config.dat` file.

d.
```
Enter Unique Log File Name:
Default: /opt/storagetek/SVAA3.1.0/Server31/
Server31Log
Type name or hit enter for default
?
```

This is the name of the file where the SVAA server will write error messages. Refer to the *SVAA for Linux User's Guide* for a complete explanation of the server log. The default is /*install_dir*/*server_name*/*server_name*`Log` (for example, `/opt/storagetek/SVAA3.1.0/Server31/Server31Log`).

Enter the full pathname for the file, or press Enter to accept the default.

Note: If you will be running multiple SVAA servers on this host, each server should have its own log file.

e.
```
The valid security modes are active, warn or none,
enter a security mode:
Default is: ACTIVE
Type a security mode or hit enter for default
?
```

This is the security mode for the SVAA server; the SVAA server will come up in this mode whenever it is started (until you explicitly change the mode). See the *SVAA for Linux User's Guide* for a complete explanation of the security modes. The default is "active" (SVAA security is in full force).

Enter a mode (`active`, `warn`, or `none`), or press Enter to accept the default.

f.
```
Enter a user group name to be the SVAA administrator
group:
Type name or hit enter for the system default admin
group name
?
```

This is the user group authorized to have SVAA administrator privileges. When SVAA security is in "active" mode, all SVAA server administration functions are limited to the user "`root`" and to users in the SVAA server administrator group. Refer to the *SVAA for Linux User's Guide* for a complete explanation of the SVAA administrator group.

The group you enter here must be a valid UNIX group, as defined in the `/etc/group` file. The default is the default Linux administrator group.

Enter the group, or press Enter to accept the default.

g.
```
Enter Unique Server Port:
Default: 41248
Type port number or hit enter for default
?
```

This is the port number for the SVAA server. The default is `41248`.

Enter any integer between 1025 and 64567, or press Enter to accept the default.

Note: If you will be running multiple SVAA servers on this host, each server must have its own unique port number.

h. `Enable Web Interface? (y/n)`

The utility asks if you want to enable the SVAA Web-based interface. The Web-based interface is currently used to generate detailed point-in-time reports of SVA subsystem activity.

Enter `y` if you want to enable the Web-based interface for this SVAA server. Enter `n` if you do not.

i.
```
Enter Unique Web Interface Port:
Default: 65535
Type port number or hit enter for default
?
```

This prompt appears if you entered `y` or pressed Enter at the previous prompt. This is the port number by which the SVAA server will communicate with the Web-based interface.

Enter any integer between 1025 and 64567, or press Enter to accept the default.

Note: This entry must be different from the Server Port number entered above. Also, if you will be running multiple SVAA servers on this host, this entry must be different from the Server Port number(s) and Web-based interface port number(s) of the other server(s).

j. `Add an ECAM device to Server configuration (y/n)?`

The utility asks if you want to add an ECAM device to the SVAA server.

Enter `y` if you want to add an ECAM device. Enter `n` if you do not.

k. `Enter device specification:`

This prompt appears if you entered `y` or pressed Enter at the previous prompt. This is the pathname of an ECAM device which the SVAA server will use for communicating with the SVA subsystem.

Enter the full pathname of the device. It should look something like:

```
/dev/sdb1
```

Note: You should have written down the of the device during SVAA pre-installation (see “Verify Linux Host Hardware Readiness” in Chapter 1., “Pre-installation”).

l. `Add another ECAM device (y/n)?`

The utility asks you if you want to add another ECAM device to the SVAA server.

Enter `y` if you want to add another ECAM device. Enter `n` if you do not.

m. `Write startup daemon to /etc/rc.d/rc3.d/ directory (y/n)?`

The utility asks you if you want to add scripts to your system that will automatically run at system startup and shutdown.

The startup script, called `/etc/rc.d/rc3.d/S98SVAA`, starts the SVAA server before starting any applications that rely on the SVA subsystem. The shutdown script, called `/etc/rc.d/rc3.d/K98SVAA`, shuts down the SVAA server after shutting down any applications that rely on the SVA subsystem.

Enter `y` if you want to install the scripts now. Enter `n` if you do not.

n. `Server Name:` *server_name*
`Server Home:` *installation_directory_path*
`Configuration Path:` *config.dat_file_path*
`Log File Name:` *log_file_path*
`Security Mode:` *mode*
`Admin Group Name:` *svaa_admin_group*
`Server Port:` *server_port_number*
`Web Interface:` *wbi_status*
`Web Interface Port:` *wbi_port_number*
`ECAM device:` *device_path*

`Are all values correct (y/n)?`

The utility displays all the values you have entered and asks you to confirm them.

Enter `y` if all the values are correct.

Enter `n` if any of the values are not correct, and all the prompts will be displayed again (after first prompting you if you want to overwrite the existing `sibserv` and `sibadmin` files).

SVAA server configuration is now complete.

Validate the SVAA Server and CLI

Use the following steps to start the SVAA server and the CLI (command line interface) and verify that they are running correctly.

Note: The SVAA server requires `localhost` to be defined; if it is unable to resolve `localhost`, the SVAA server will not start. Therefore, if necessary, you should define `localhost` prior to starting the SVAA server.

1. Log in as `root`, if you aren't already.
2. Bring up a terminal or console window.
3. Change to the SVAA server installation directory:

   `# cd` *install_dir*

   Where *install_dir* is the pathname of the installation directory you specified during SVAA server configuration (typically `/opt/storagetek/SVAA3.1.0`).

4. Start the SVAA server:

```
# cd bin
# ./sibserv
```

Note: Refer to the *SVAA for Linux User's Guide* for a complete explanation of the `sibserv` command and its options.

As soon as you see the message `Running SVAA Server`, proceed to the next step.

5. To verify that the server is communicating with the SVA subsystem, open another terminal or console window and type the following:

```
# cd install_dir/bin
# ./sibadmin querysubsystem
```

The display should appear similar to the following example:

```
SVAA Server: Server31      Date/Time: 01-24-2001 22:20:07 MDT
SubsysDev
SubsysProd
SubsysTest
```

6. In this same console or terminal window, start the CLI (command line interface):

```
# ./sibadmin
```

Note: Refer to the *SVAA for Linux User's Guide* for a complete explanation of the `sibadmin` command and its options.

7. To verify that the CLI is communicating with the SVAA server, type the following at the CLI prompt:

```
SIB> queryversion
```

The display should appear similar to the following example:

```
SVAA Server: Server31      Date/Time: 12-12-2001 17:01:33 MDT

Shared Virtual Array Administrator 3.1.0 PPFinfo PTF=L2P004J Patch=12 Fix=0 Issue=695582
for Linux
```

8. Shut down the SVAA server:

```
SIB> shutdownserver
SIB9862D: Halt the SVAA server Server31 (y/n)? y
SIB9604I: Disconnected with server.
```

9. Exit from the CLI:

```
SIB> exit
```

Validation is now complete.

SVAA Server Security Considerations

SVAA server administration functions are limited to the user "`root`" and to users in the SVAA server administrator group (which you have defined with the `sibconfig` utility).

Note: SVAA administrator privileges apply only to SVAA server administration functions. In order for any user (including members of the SVAA administrator group and `root`) to be able to perform functions that modify the SVA subsystem (such as defining devices or forming arrays), the user must have write-access to a privileged ECAM device. Other restrictions apply for specific functions, such as snapping a partition. For complete details, see the following sections in the *SVAA User's Guide*:

- "Chapter 2, Security"—Describes the SVAA server security system.
- "Chapter 5, SVAA CLI Commands"—Describes how to use the CLI and provides detailed reference on all commands.

Chapter 3. De-installation

If, for some reason, you want to de-install the SVAA server files from the Linux host, use these steps.

1. Log in as `root`.
2. Open a terminal or console window.
3. Change to the installation directory:

   `# cd` *install_dir*

   The typical *install_dir* is `/opt/storagetek/SVAA3.1.0`.
4. Verify that you are in the correct directory:

   ```
   # pwd
   ```
5. Recursively remove all files and subdirectories from the installation directory:

   ```
   # rm -fR *
   ```
6. Go back up one directory level:

   ```
   # cd ..
   ```
7. Verify that you are in the correct directory:

   ```
   # pwd
   ```
8. Remove the server subdirectory:

   `# rmdir` *server_dir*

   The typical *server_dir* is `SVAA3.1.0`.
9. If, when you ran the `sibconfig` utility, you chose to install the automatic startup and shutdown scripts, type the following commands to remove the scripts from the system:

   ```
   # cd /etc/rc.d/rc3.d
   # rm S98SVAA
   # rm K98SVAA
   # cd /etc/init.d
   # rm svaa
   ```

De-installation is now complete.

Glossary

A

array—A group of drive modules used collectively to achieve data redundancy and/or improved performance. An array consists of either 7 or 15 drive modules (15 only for V960 or V2X subsystems). There can be up to 8 arrays in a subsystem.

array device—The disk devices that are logically grouped together when a `formarray` command is issued at the local operator panel or from SVAA.

B

back-end storage—The data storage portion of a storage system. In the Shared Virtual Array, this is the disk array on the subsystem.

C

cache—Solid-state, random-access memory that is located in a controller. The cache retains frequently used data for faster access. In the Shared Virtual Array, all data access is through cache.

channel interface—See "I/O interface".

CKD device—A storage device that uses the "count-key-data (CKD)" format.

CLI (command line interface)—In SVAA, a user interface on the UNIX host system used to issue commands for configuring and monitoring the SVAA server and the SVA subsystem.

client—the CLI (command line interface) is a client of the SVAA server.

count-key-data (CKD)—A recording format that writes variable-length records. Each record consists of 1) a count field, which specifies the length of the (optional) key field and the data field of the record, 2) the (optional) key field, and 3) a data field. The first record on each track contains a fourth field, home address. Contrast with "fixed-block architecture (FBA)".

D

disk array—The logical grouping of drive modules on a Shared Virtual Array.

domain—An SVA subsystem addressing scheme, prefixed to SCSI target and LUN addresses, that extends the number of addressable devices from SCSI-attached hosts.

drain—The Shared Virtual Array process that gradually moves data stored on a drive module or a disk array to other devices. Drains allow for the non-disruptive de-installation of a device.

drive module—One of the inexpensive disks comprising the storage in an SVA subsystem. A physical device.

dynamic configuration—A Shared Virtual Array feature that allows the I/O interfaces and up to 1024 (in the case of V960 or earlier subsystems) or 4096 (in the case of V2X subsystems) functional devices to be defined and/or altered. The functional configuration of a Shared Virtual Array can be determined by user requirements, rather than available physical devices.

E

ECAM (extended control and monitoring facility)—The communications protocol that permits communication between SVAA and the SVA subsystem. See also "ECAM device" and "privileged ECAM device".

ECAM device—A functional device over which ECAM messages are exchanged between the Shared Virtual Array disk array controller and the SVAA server.

ESCON—Enterprise Systems Connection. An IBM standard for connecting peripheral devices to a host system via fibre-optic cables.

ESCON channel—A channel that uses fiber-optic (ESCON) cables to transmit data between the host and the disk array controller.

F

FDID—Functional device ID. The ID for a functional device as it is known to the SVA subsystem and the SVAA server. FDIDs range from 0 to 3FF, hexadecimal, for V960 and earlier subsystems; 0 to FFF, hexadecimal, for V2X subsystems. See “functional device”.

fixed-block architecture (FBA)—A recording format in which every track of the device is formatted with a fixed number of fixed-length records (generally called sectors), each of which contains an identifier (ID) field and a data field. Contrast with “count-key-data (CKD)”.

functional—The term used to describe the Shared Virtual Array system interface as viewed by the host, application, and users. This interface appears as a SCSI or 3990-3 system interface.

functional device—The disk device image viewed by the host operating system.

I

index 0 device—The parent device in a SCSI larger LUN device. Child devices are devices 1–n.

initiator—A device that begins a SCSI transaction by issuing a command to another device (the target) to perform a task. Typically, a SCSI host adaptor is the initiator. Contrast with “target”.

I/O interface—The Shared Virtual Array circuitry that attaches to the host system. Can be fibre or ESCON.

K

known SVA subsystem—A subsystem to which the local SVAA server has access.

L

larger LUN (LLUN) device—See “SCSI larger LUN (LLUN) device”.

local operator panel (LOP)— A user interface, located on the front door of the SVA subsystem, used to control and configure the SVA subsystem.

logical unit number (LUN)—A method to expand the number of devices on a SCSI bus. LUNs address up to eight devices at each SCSI ID.

LOP—See “local operator panel (LOP)”.

LUN—See “logical unit number (LUN)”.

M

MAT partition—The SVA subsystem partition consisting of drive modules that are not yet available for storing user data. Drive modules are automatically members of the MAT partition when they are first physically inserted in the SVA subsystem or when they have been drained of data.

N

NCL—See “net capacity load (NCL)”.

net capacity load (NCL)—A percentage of the total number of sectors used to store user data. It is based on physical capacity used. This number is 2KB times the number of physical sectors actually used to store user data, not including redundancy data.

P

parallel channel—A channel that uses bus-and-tag cables to transmit data between the mainframe and the disk array controller.

partition—1) In the SVA subsystem, the logical separation of devices, arrays, or groups of arrays to allow different modes of operation. The SVAA for Linux server supports the following partitions: MAT, Production, Spares, and Unavailable.

2) In SCSI disk management, a group of cylinders used by a file system. Each partition appears to the operating system as a separate disk drive.

physical device—See “drive module”.

point-in-time reports—SVA subsystem reports generated through the SVAA Web-based interface.

PPRC bridge pair—A primary bridge volume and its associated secondary bridge volume. There are both PPRC data bridge pairs and PPRC status bridge pairs.

PPRC data bridge volume—Used by Power PPRC as a staging area for PPRC data.

PPRC link—The physical ESCON connection between two SVA subsystems.

PPRC pair—A primary volume and its associated secondary volume. PPRC pairs are established and de-established using SVAA commands.

PPRC path—The logical connection between two virtual control units (VCUs) used by PPRC.

PPRC primary volume—A device that is being mirrored under PPRC control. A primary volume can be copied to only one secondary volume.

PPRC secondary volume—A device that is receiving mirrored data from a primary volume.

PPRC status bridge volume—Used by Power PPRC for acknowledgments that PPRC data has been successfully transmitted and received.

privileged ECAM device—One of the only devices that SVAA can use to send messages to the SVA subsystem to request a change in the subsystem's state. Such messages include those that alter the subsystem configuration or start a drain.

At least one privileged ECAM device must be defined in each SVA subsystem.

Production partition—The SVA subsystem partition consisting of drive modules used for storing and retrieving user data.

S

SCSI—See "Small Computer Systems Interface (SCSI)".

SCSI bus—A pathway for data that conforms to the SCSI standard.

SCSI device—A device that conforms to the SCSI standard.

SCSI ID—The unique address of a SCSI device. SCSI IDs range from 0 to 7 for 8-bit systems, 0 to 15 for 16-bit systems, and 0 to 31 for 32-bit systems.

SCSI larger LUN (LLUN) device—A device consisting of one or more functional devices, viewed by the host system as a single logical device. SCSI larger LUN devices can be virtually any size.

serial channel—See "ESCON channel".

Shared Virtual Array (SVA)—An online, random access disk array storage system composed of disk storage and control unit combined into a single frame.

Shared Virtual Array Administrator (SVAA)—A server-based product providing SVA subsystem configuration and administration functions. Runs on UNIX, Windows, and S/390 platforms.

Shared Virtual Array Console (SVAC)—A GUI interface that connects to an SVAA server and provides SVA subsystem configuration, administration, and reporting functions. Runs on Windows NT.

slot—The physical location of a Shared Virtual Array drive module.

Small Computer Systems Interface (SCSI)— An I/O interface with a standard, device-independent protocol that allows many different peripheral devices to be attached to a host system.

space release—An SVAA facility that informs an SVA subsystem that the space in a SCSI partition can be released because the information in the partition is no longer needed.

Spares partition—The SVA subsystem partition consisting of drive modules that are physically installed but not logically associated with an array. Drive modules in the Spares partition are used to form production arrays, to reconstruct failed disks, and to receive data from drive modules being drained.

subsystem—A secondary or subordinate system, usually capable of operating independently of a controlling system.

SVA—See "Shared Virtual Array (SVA)".

SVA subsystem—See "Shared Virtual Array (SVA)".

SVAA—See "Shared Virtual Array Administrator (SVAA)".

SVAA server—See "Shared Virtual Array Administrator (SVAA)".

SVAA server cache—A cache of information maintained by the SVAA server for each SVA subsystem to which it has access. Includes information about the overall SVA subsystem, its I/O interfaces, physical devices, and functional devices.

SVAC—See "Shared Virtual Array Console (SVAC)".

T

target—A SCSI device that executes a command from another device (the initiator) to perform a task. Typically, a SCSI peripheral device is the target. Contrast with "initiator".

tray—The physical packaging of eight drive modules in a Shared Virtual Array.

U

Unavailable partition—The SVA subsystem partition consisting of drive modules that are not available for use in an array. This includes drive modules that have failed or that are not yet physically installed.

unknown SVA subsystem—A subsystem to which the local SVAA server does not have access.

V

virtual storage architecture—The innovative storage architecture used by Shared Virtual Array storage to extend the capabilities of traditional online storage.

VSAM volume data set (VVDS)—Mainframe term referring to the volume data set that describes the characteristics of VSAM (virtual storage access method) or SMS (storage management subsystem) managed data sets residing on the volume. There is one, and only one, VVDS for each volume containing either SMS-managed data sets or VSAM data sets cataloged in an ICF (integrated catalog facility) catalog.

volume table of contents (VTOC)—Mainframe term referring to the volume data set that describes the characteristics of each data set stored and the space remaining available for use on the volume. There is one VTOC per volume.

W

Web-based interface—Graphical user interface (GUI) to the SVAA server that can be accessed through a Web browser.

Index

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