

# StorEdge 3510/FC FRU Replacement How To Guide v.47a\*\*

## Before beginning any FRU replacement procedure, complete the following:

### 1. If you are connected to the Console Menu Interface via the RAID Controller serial port:

\*\*CAUTION: Always press <Ctrl> + 1 (the “ell” key) to refresh the Console Menu Interface when first connecting to a SE 3x10 array through telnet or a serial connection.

\*\*NOTE: If pop-up event notices are displayed on the screen, use the <Esc> key or <Ctrl> + c, then <Enter> to clear them.

- A. Ensure the serial cable from the host or laptop is connected to the correct RAID chassis.
- B. For serial access from a UNIX host, the command `tip -38400 /dev/ttya` or `tip -38400 /dev/ttyb`, as appropriate; can be used.
  - i. If the Menu Interface still doesn't work correctly, try again by replacing the -38400 with -9600.
- C. Skip ahead to the FRU replacement procedures below.

### 2. If you are connected to the Console Menu Interface via telnet:

\*\*CAUTION: Always press <Ctrl> + 1 (the “ell” key) to refresh the Console Menu Interface when first connecting to a SE 3x10 array through telnet or a serial connection.

\*\*NOTE: If pop-up event notices are displayed on the screen, use the <Esc> key or <Ctrl> + c, then <Enter> to clear them.

- A. From the Main Menu, select view and edit Configuration parameters, then Communication Parameters, and Internet Protocol (TCP/IP).
  - i. Take note of the last four digits of the MAC address, excluding the colon between them. For Example: 00:C0:FF:80:**05:63**, would be **0563**. *MAC address:*
- B. Inspect the disk drive bay of the RAID chassis you intend to work on.
  - i. Locate the serial number sticker on the lower left hand side, between the first two columns of disk drives.
  - ii. If the serial number sticker ends with the same number as you wrote down in step A. above, your telnet session is connected to the correct chassis.
- C. Continue on to the FRU replacement procedures below.

## **Table of Contents**

## **Page**

<b>How to replace a Disk Drive (36/15k 540-5628)(73/10k 540-5629)(73/15k 540-6098) (146/10k 540-5626) in a RAID or attached JBOD chassis</b>	<b>2</b>
<b>How to replace a RAID I/O Module (370-5537)</b>	<b>9</b>
<b>How to replace an I/O Module (370-5538) in a JBOD or RAID Chassis</b>	<b>12</b>
<b>How to replace a Battery Module (370-5545)</b>	<b>13</b>
<b>How to replace a PCU (A/C 370-5398)(D/C 370-6798)</b>	<b>14</b>
<b>How to replace an expansion JBOD fibre cable (370-5540) or a drive-side SFP (370-5211)</b>	<b>14</b>
<b>How to replace a Midplane/Chassis (370-5535)</b>	<b>15</b>

\*\*CAUTION: This guide is intended to give specific guidance for most, conceivable FRU replacement scenarios. If, however, this document describes indications that don't match the scenario you are observing, the document is NOT VALID for your situation. At that point you should immediately escalate your case to a more experienced engineer.

\*\*NOTE: This PDF document contains blank spaces that will auto-fill with the appropriate information once it has been entered. Care should be taken to correctly fill in each information box when directed to. The blank spaces can be ignored when this document is used in hard-copy.

## How to replace a Disk Drive in a RAID or attached JBOD chassis:

A. Inform the Customer that you are about to save the current NVRAM configuration to the chassis' disks.

I. In the Console Menu Interface: from the Main Menu, select system Functions, then Controller maintenance.

II. Select Save nvram to disks, confirm Yes when prompted, then press the Escape key.

B. Set Periodic Drive Check Time to 5 seconds:

I. From the Main Menu, select view and edit Configuration parameters, then Drive-side SCSI Parameters.

II. Set the option Periodic Drive Check Time to 5 seconds, then confirm Yes when prompted.

C. Use this step to determine the Channel numbers and Loop ID (i.e. Chl 2(3) ID 4) of the *Target Disk Drive*:

**\*\*NOTE:** If you already know the Channel/Loop ID of the *Target Disk Drive*, write it here (i.e. 2/3-4):  
**and then skip ahead to step D.**

I. From the Main Menu, select view and edit scsi Drives.

a. Find the disk drive that has a status of *BAD* or *FAILED* in the Status column.

i. Write down the Channel numbers and Loop ID of the *Target Disk Drive* (i.e. 2/3-4) from the Chl and ID columns.

D. Use this step to physically locate the *Target Disk Drive*:

**\*\*NOTE:** If you already know the physical location of the *Target Disk Drive*, skip ahead to step E.

**\*\*NOTE:** This step uses a process of associating the SES Loop ID (which refers to it's chassis' serial number) with the *Target Disk Drive*'s Loop ID to physically locate the chassis containing *Target Disk Drive*.

**\*\*WARNING:** This step assumes each chassis has a unique chassis ID. If that is not true, this step is NOT VALID for your configuration and WILL NOT WORK.

I. Use the “**Disk Drive and SES Loop ID tables**” below, to determine and write down the *Target SES Loop ID* for the chassis that houses the *Target Disk Drive*.

a. For example: If the *Target Disk Drive*'s Loop ID is 35, the the associated *Target SES Loop ID* would be 44.  
**Target SES Loop ID:**

II. From the Main Menu, select view and edit scsi Drives.

III. In the view and edit scsi Drives sub-menu scroll up or down to find the *Target SES Loop ID* that has the same Chl numbers as the *Target Disk Drive*.

IV. Select this *Target SES Loop ID* entry, then select View drive information.

V. Write down the *Target Chassis Serial Number*, which is the last five digits on the Node Name(WWNN) line.

a. For example: Node Name(WWNN) | 20 40 00 C0 FF 00 38 15 the *Target Chassis Serial Number* is 03815.  
**Target Chassis Serial Number:**

VI. Physically locate the RAID or JBOD chassis, based on the serial number label on the bottom left side of it's drive bay.

VII. Locate the *Target Disk Drive* based it's slot position using the “**Disk Drive and SES Loop ID tables**” below.

**\*\*WARNING:** Failure to identify the correct disk drive will result in replacing the wrong disk drive and may cause a loss of customer data. If you are not certain of the exact position of the *Target Disk Drive* , escalate to a more senior engineer.

**Disk Drive and SES Loop ID tables**

**Disk drive Loop IDs 0 – 11**

0	3	6	9	<i>Chassis ID 0</i>
1	4	7	10	<u>SES Loop ID</u>
2	5	8	11	12

(front view)

**Disk drive Loop IDs 16 - 27**

16	19	22	25	<i>Chassis ID 1</i>
17	20	23	26	<u>SES Loop ID</u>
18	21	24	27	28

(front view)

**Disk drive Loop IDs 32 – 43**

32	35	38	41	<i>Chassis ID 2</i>
33	36	39	42	<u>SES Loop ID</u>
34	37	40	43	44

(front view)

**Disk drive Loop IDs 48 - 59**

48	51	54	57	<i>Chassis ID 3</i>
49	52	55	58	<u>SES Loop ID</u>
50	53	56	59	60

(front view)

**Disk drive Loop IDs 64 – 75**

64	67	70	73	<i>Chassis ID 4</i>
65	68	71	74	<u>SES Loop ID</u>
66	69	72	75	76

(front view)

**Disk drive Loop IDs 80 - 91**

80	83	86	89	<i>Chassis ID 5</i>
81	84	87	90	<u>SES Loop ID</u>
82	85	88	91	92

(front view)

**Disk drive Loop IDs 96 – 107**

96	99	102	105	<i>Chassis ID 6</i>
97	100	103	106	<u>SES Loop ID</u>
98	101	104	107	108

(front view)

**Disk drive Loop IDs 112 - 123**

112	115	118	121	<i>Chassis ID 7</i>
113	116	119	122	<u>SES Loop ID</u>
114	117	120	123	124

(front view)

E. Unseat the *Target Disk Drive* , let it spin down for 20 seconds, and install the replacement.

F. Scan the **Replaced Disk Drive** into the configuration:

\*\*NOTE: Newer firmware versions may scan a disk drive automatically. If the this step fails, but the *Replaced Disk Drive* has a status of NEWDRV, FMTDRV or USEDREV, skip ahead to step G.

I. From the Main Menu, select view and edit scsi Drives.

II. Select any disk drive in the list, then select Scan scsi drive.

III. Select the SCSI Channel number, then the ID number of the *Replaced Disk Drive* , and confirm Yes when prompted.

G. Determine the RAID level, and Status of the *Target Logical Drive*:

I. From the Main Menu, select view and edit scsi Drives.

a. Find the Channel/Loop ID of the *Target Disk Drive* .

i. As shown in the LG\_DRV column, write down the number of the **Target Logical Drive** (i.e. 0):

II. From the Main Menu, select view and edit Logical drives.

a. As shown in the RAID column of the *Target Logical Drive* , write down its **RAID level**:

b. As shown in the Status column of the *Target Logical Drive* , write down its **STATUS**:

H. Consult the following **Disk Drive Procedure (DDP)** decision table before preceding:

I. If every statement in a cell in the “If...” column is completely true; then complete every step, in order, prescribed in the cell next to it in the “then...” column.

If...	then...
the <i>Target Logical Drive's</i> status is <u>GOOD</u> <b>and</b> its RAID level is 1 <b>and</b> the customer wants the <i>Replaced Disk Drive</i> re-integrated into the <i>Target Logical Drive</i> ...	complete step “ <u>DDP#1: Re-integrating the Replaced Disk Drive into the GOOD RAID 1 Logical Drive.</u> ”
the <i>Target Logical Drive's</i> status is <u>GOOD</u> <b>and</b> its RAID level is 3 or 5 <b>and</b> the customer wants the <i>Replaced Disk Drive</i> re-integrated into the <i>Target Logical Drive</i> ...	complete step “ <u>DDP#2: Re-integrating the Replaced Disk Drive into the GOOD RAID 3 or 5 Logical Drive</u> ”
the <i>Target Logical Drive's</i> status is <u>GOOD</u> or <u>REBUILDING</u> , <b>and</b> its RAID level is 1, 3, or 5 <b>and</b> the customer wants the <i>Replaced Disk Drive</i> set as a spare drive...	complete step “ <u>DDP#4: Assigning a disk drive as a spare</u> ”
the <i>Target Logical Drive's</i> status is <u>REBUILDING</u> , <b>and</b> its RAID level is 1, 3, or 5 <b>and</b> the customer wants the <i>Replaced Disk Drive</i> re-integrated into the <i>Target Logical Drive</i> ...	complete step “ <u>DDP#3: Re-integrating the Replaced Disk Drive into the REBUILDING RAID 1, 3, or 5 Logical Drive</u> ”
the <i>Target Logical Drive's</i> status is <u>DRV FAILED</u> or <u>DRV ABSENT</u> ...	complete step “ <u>DDP#5: Rebuilding the Target Logical Drive with the Replaced Disk Drive</u> ”
the <i>Target Logical Drive's</i> status is <u>FATAL FAIL</u> or <u>INCOMPLETE</u> , <b>and</b> its RAID level is 1, 3, or 5...	escalate this case to a senior SSE or RSSE to determine if this Logical Drive can be recovered. If the data cannot be recovered, complete step “ <u>DDP#6: Removing and recreating a Logical Drive</u> ”
the <i>Target Logical Drive's</i> status is <u>FATAL FAIL</u> or <u>INCOMPLETE</u> , <b>and</b> its RAID level is NRAID or RAID 0...	complete step “ <u>DDP#6: Removing and recreating a Logical Drive</u> ”
none of the above statements are <b>exactly</b> true...	escalate this case to a more senior engineer.

## DDP#1: Re-integrating the Replaced Disk Drive into the GOOD RAID 1 Logical Drive

- I. Find all of the *Assigned Local Spare Drives* for the *Target Logical Drive* , and temporarily delete each one:
  - a. From the Main Menu, select view and edit Logical drives.
  - b. Select the *Target Logical Drive* , then View scsi drives.
  - c. Write down the Chl and ID of each *Assigned Local Spare Drive*:
    - i. Each *Assigned Local Spare Drive* will list the *Target Logical Drive* in the LG DRV column **and** have a Status of STAND-BY. Write down each one (i.e. 2/3-4):
  - d. Complete the following steps for each *Assigned Local Spare Drive*:
    - i. From the Main Menu, select view and edit scsi Drives.
    - ii. Select, in turn, each *Assigned Local Spare Drive* , select Delete global/local spare drive, then confirm Yes when prompted.
- II. Select the *Replaced Disk Drive* , then add Local spare drive.
  - a. Select the *Target Logical Drive* , then confirm Yes when prompted.
- III. Consult with the customer to identify the *Previous Spare Disk Drive* which is going to be removed from the *Target Logical Drive* in favor of the *Replaced Disk Drive*:
  - a. Write down the Chl and ID of the *Previous Spare Disk Drive* (i.e. 2/3-4):
    - i. Physically locate the *Previous Spare Disk Drive* (use step “D. Use **this step to physically locate the Target Disk Drive:**” above, if needed) and unseat it approximately 1 inch.
- IV. After approximately 10 seconds the status of the *Replaced Disk Drive* should change to REBUILD.
  - a. The status of the *Previous Spare Disk Drive* will change to BAD.
    - i. Once it has, re-install the *Previous Spare Disk Drive*.
- V. Select any disk drive, then select Scan scsi drive.
- VI. Select the SCSI Channel number, then enter the ID number of the *Previous Spare Disk Drive* , and confirm Yes when prompted.
- VII. Complete the following steps for **each** of the *Assigned Local Spare Drives* from step I. above:
  - a. Select the *Assigned Local Spare Drive* (its LG DRV membership should be NONE), then select add Local spare drive.
    - a) Select the *Target Logical Drive* , then confirm Yes when prompted.
- VIII. Skip ahead to the procedure “**Assigning a disk drive as a spare**” to return the *Previous Spare Disk Drive* to a local or global spare, according to the customer's needs.

## DDP#2: Re-integrating the Replaced Disk Drive into the GOOD RAID 3 or 5 Logical Drive

- I. Consult with the customer to identify the *Previous Spare Disk Drive* which is going to be removed from the *Target Logical Drive* in favor of the *Replaced Disk Drive*:
  - a. Write down the Chl and ID of the *Previous Spare Disk Drive* (i.e. 2/3-4):
- II. From the Main Menu, select view and edit Logical drives.
- III. Select the *Target Logical Drive* , then cOpy and replace drive.
- IV. Select the *Previous Spare Disk Drive* , then select the *Replaced Disk Drive* , and confirm Yes when prompted.
- V. The copy and replace operation may last for an extended period of time (several hours for a large Logical Drive or when I/O is heavy). Returning the *Previous Spare Disk Drive* to a spare status can only be accomplished after the copy and replace operation has completed. The procedure can be performed by a Sun Engineer or by a technically proficient customer.
  - a. Skip ahead and review or perform the procedure “**Assigning a disk drive as a spare**” to return the *Previous Spare Disk Drive* to a local or global spare, according to the customer's needs.

### **DDP#3: Re-integrating the Replaced Disk Drive into the REBUILDING RAID 1, 3, or 5 Logical Drive**

- IX. Find all of the *Assigned Local Spare Drives* for the *Target Logical Drive* , and temporarily delete each one:
- e. From the Main Menu, select view and edit Logical drives.
  - f. Select the *Target Logical Drive* , then View scsi drives.
  - g. Write down the Chl and ID of each *Assigned Local Spare Drive*:
    - ii. Each **Assigned Local Spare Drive** will list the *Target Logical Drive* in the LG\_DRV column **and** have a Status of STAND-BY. Write down each one (i.e. 2/3-4):
  - h. Complete the following steps for each *Assigned Local Spare Drive*:
    - i. From the Main Menu, select view and edit scsi Drives.
    - ii. Select, in turn, each *Assigned Local Spare Drive* , select Delete global/local spare drive, then confirm Yes when prompted.
- I. The **Previous Spare Disk Drive** for the *Target Logical Drive* will have a Status of REBUILD. Write down its number here (i.e. 2/3-4):
- II. From the Main Menu, select view and edit Logical drives.
- III. Select the *Target Logical Drive* , Abort rebuild, then confirm Yes when prompted.
- IV. Select the *Target Logical Drive* , Rebuild logical drive, then confirm Yes when prompted.
- X. Complete the following steps for **each** of the *Assigned Local Spare Drives* from step I. above:
- a. Select the *Assigned Local Spare Drive* (its LG\_DRV membership should be NONE), then select add Local spare drive.
    - a) *Select the Target Logical Drive* , then confirm Yes when prompted.
- V. Skip ahead to the procedure “**Assigning a disk drive as a spare**” to return the *Previous Spare Disk Drive* to a local or global spare, according to the customer's needs.

### **DDP#4: Assigning a disk drive as a spare**

- I. From the Main Menu, select view and edit scsi Drives.
- II. Select the *Replaced Disk Drive* or *Previous Spare Disk Drive* , as appropriate (its LG\_DRV membership should be NONE), then complete **either** step a. **or** step b. below:
- a. add Local spare drive.
    - i. Select the *Target Logical Drive* , then confirm Yes when prompted.
    - b. add Global spare drive, then confirm Yes when prompted.
- III. Disabling Periodic Drive Check Time:
- a. From the Main Menu, select view and edit Configuration parameters, then Drive-side SCSI Parameters.
  - b. Set the option Periodic Drive Check Time to Disabled, then confirm Yes.
- IV. **\*\*\*This procedure is complete, DO NOT EXECUTE ANY REMAINING STEPS.\*\*\***

### **DDP#5: Rebuilding the Target Logical Drive with the Replaced Disk Drive**

- I. From the Main Menu, select view and edit Logical drives.
- II. Select the *Target Logical Drive* , Rebuild logical drive then confirm Yes when prompted.
- III. Disabling Periodic Drive Check Time:
- a. From the Main Menu, select view and edit Configuration parameters, then Drive-side SCSI Parameters.
  - b. Set the option Periodic Drive Check Time to Disabled, then confirm Yes.
- IV. **\*\*\*This procedure is complete, DO NOT EXECUTE ANY REMAINING STEPS.\*\*\***

## DDP#6: Removing and recreating a Logical Drive

\*\*\*NOTE: When a Logical Drive is in the state of FATAL FAIL or INCOMPLETE, the Partitioning information for it is not accessible. Consult with the customer to obtain their specifications for the new Logical Drive Partitions that will be created with this procedure.

I. Determine the *Target RAID Controller* that the *Target Logical Drive* is assigned to:

II. From the Main Menu, select view and edit Logical drives.

a. Based on the following information, write down the ***Target RAID Controller*** (i.e. Primary or Secondary):

- i. If the *Target Logical Drive* number is preceded by a P, *Target RAID Controller* is the Primary Controller.
- ii. If the *Target Logical Drive* number is preceded by a S, *Target RAID Controller* is the Secondary Controller.

III. Determine all of the information related to *Host LUN mappings*:

a. From the Main Menu select view and edit Host luns.

b. Select, one at a time, each entry that refers to the *Target RAID Controller* ( ) and perform the following steps:

- i. **ONLY for each entry that contains "LD" in the LV/LD column AND the number of the Target Logical Drive ( ) in the DRV column:**
  - In the table below, write down the Chl and ID (from the view and edit Host luns menu) that is currently highlighted.
  - In the table below, write down the LUN, DRV (Logical Drive ), and Partition information.
  - Be sure to scroll down to LUN 31 to view all of the mapped LUNs.
- ii. Press the Escape key to return to the view and edit Host luns menu.

<u>Chl</u>	<u>ID</u>	<u>LUN</u>	<u>DRV</u>	<u>Partition</u>		<u>Chl</u>	<u>ID</u>	<u>LUN</u>	<u>DRV</u>	<u>Partition</u>

IV. Delete each Host Channel LUN mapping:

\*\*\***WARNING:** The following steps are used to remove Host Channel LUN mappings. If LUN mappings are removed from the incorrect Logical Drive or Partition, the attached host(s) will instantly lose access to their data. This would cause an immediate, unscheduled outage of the customer's services and possibly data corruption. If you are not **ABSOLUTELY** certain you can perform this procedure correctly, escalate to a more senior engineer.

a. Perform the following step for each of the mappings you wrote down in the table in step III. above:

- i. From the view and edit Host luns menu, select the entry that contains the CHL and ID.
- ii. Select the entry that contains the LUN number, then confirm Yes when prompted to 'Unmap Host Lun ?'.

V. If the *Target Logical Drive* is RAID 1, 1+0, 3 or 5:

a. Find all of the *Assigned Local Spare Drives* for the *Target Logical Drive* :

- i. From the Main Menu, select view and edit Logical drives.
- ii. Select the *Target Logical Drive* , then View scsi drives.
- iii. Based on the criteria below, write down the Chl and ID of each ***Assigned Local Spare Drive***:
  - Each *Assigned Local Spare Drive* will list the *Target Logical Drive* in the LG\_DRV column **and** have a Status of STAND-BY.

VI. Based on the following criteria, write down all of the *Target Logical Drive* 's **Member Disk Drives**:

- a. Write down the Chl and ID of each disk drive that **doesn't** have a Status of STAND-BY.

VII. Delete the *Target Logical Drive*:

- a. From the view and edit Logical drives menu select the *Target Logical Drive* , then Delete logical drive. Confirm Yes when prompted to 'Delete Logical Drive ?'.

VIII. Create a new *Target Logical Drive*:

- a. Select the *Target Logical Drive* and confirm Yes when prompted.
- b. Select the RAID level of the *Target Logical Drive*.
- c. Select each of the *Member Disk Drives* . Press the Escape key when finished.
- d. If the *Target Logical Drive* is RAID 1, 1+0, 3 or 5:
  - i. If you wrote down any Assigned Local Spare Drives in step V. above, select Assign Spare Drives.
    - Select each of the *Assigned Local Spare Drives* . Press the Escape key when finished.
- e. Perform the following step only if the *Target RAID Controller* ( ) is not the Primary:
  - i. Select Logical Drive Assignments and confirm Yes when prompted to '...Assign to Secondary Controller ?'.
- f. Press the Escape Key, then confirm Yes when prompted to 'Create Logical Drive ?'.

IX. Obtain the partitioning information for *Target Logical Drive* from the customer and create the Logical Drive Partitions after the Logical Drive has completed initialization:

- a. From the Main Menu, select view and edit Logical drives.
- b. Select Partition logical drive, then confirm Yes when prompted.
  - i. Select the highest numbered existing partition, type in its new size, then confirm Yes when prompted.
  - ii. Repeat the above step until you reach the desired number of partitions.

X. Recreate each Host Channel LUN mappings based on the table below and the table from step III. above:

<u>Chl</u>	<u>ID</u>	<u>LUN</u>	<u>DRV</u>	<u>Partition</u>	<u>Chl</u>	<u>ID</u>	<u>LUN</u>	<u>DRV</u>	<u>Partition</u>

- a. From the Main Menu select view and edit Host luns.
- b. Select the entry that contains the correct Host CHL and ID combination.
- c. If prompted, select Logical Drive.
- d. Select the correct LUN number, then select the *Target Logical Drive* .
- e. Select the correct Partition, select Map Host LUN, then confirm Yes when prompted.

XI. Disabling Periodic Drive Check Time:

- a. From the Main Menu, select view and edit Configuration parameters, then Drive-side SCSI Parameters.
- b. Set the option Periodic Drive Check Time to Disabled, then confirm Yes when prompted.

XII. **\*\*\*This procedure is complete, DO NOT EXECUTE ANY REMAINING STEPS.\*\*\***

## How to replace a RAID I/O Module:

**\*\*WARNING:** Before beginning this procedure, verify with this customer that all hosts that access this RAID unit have a least one viable path to each of the host's LUNs through the other (RAID) I/O Module. Failure to do so may result in the unexpected loss of access to the customer's data and services.

**\*\*NOTE:** FCO A0237-2 mandates that all rev. 04/50 RAID I/O Modules be replaced with rev. 06/50 modules. See this FCO for further details.

A. Inform the Customer that you are about to save the current NVRAM configuration to the chassis' disks.

I. In the Console Menu Interface: from the Main Menu, select system Functions, then Controller maintenance.

II. Select Save nvram to disks, confirm Yes when prompted, then press the Escape key.

B. If a Module has six SFP ports on it, it is a RAID I/O Module, if it has only two, it is an I/O Module.

I. Write down, in the table below, if each module is a RAID I/O or an I/O Only Module.

C. Check each Module's Status LED (The LED to the right of the channel 1 SFP port on the RAID I/O Module). Based on the following information, write down the status (Primary, Secondary, or offline) of the (RAID) I/O Module in each slot in the table below:

I. If a RAID I/O Module's Status LED is solid amber, it's Role is *N/A* and it is *offline*.

II. If a RAID I/O Module's Status LED is blinking green, it's Role is *PRIMARY* and it is *online*.

III. If a RAID I/O Module's Status LED is solid green, it's Role is *SECONDARY* and it is *online*.

IV. If both RAID I/O Module's Status LEDs are solid green for more than two minutes then both RAID I/O Modules' Roles are *N/A* and they are both *offline*.

V. If one RAID I/O Module's Status LED is solid amber and the other's Status LED is off then both RAID I/O Modules' Roles are *N/A* and they are both *offline*.

<u>Controller Position</u>	<u>RAID I/O or I/O Only</u>	<u>Role</u>	<u>online/offline</u>
Top Module			
Bottom Module			

D. Write down the slot (Top or Bottom) of the **Target RAID I/O Module** (the one to be replaced) here:

E. Consult the following **RAID I/O Module Procedure (RMP)** decision table before proceeding:

I. If every statement in a cell in the "If..." column is completely true; then complete every step, in order, prescribed in the adjacent cell in the "then..." column.

<b>If...</b>	<b>then...</b>
the chassis is configured with two RAID I/O Modules <b>and</b> both RAID I/O Modules are online...	complete step " <u>RMP#1: Proactive RAID I/O Module removal.</u> " then complete step " <u>RMP#3: Standard RAID I/O Module replacement.</u> "
the chassis is configured with two RAID I/O Modules <b>and</b> only one RAID I/O Module is online...	complete step " <u>RMP#2: Offline RAID I/O Module removal.</u> " then complete step " <u>RMP#3: Standard RAID I/O Module replacement.</u> "
the chassis is configured with two RAID I/O Modules <b>and</b> both RAID I/O Modules are offline...	escalate this case to a senior SSE or RSSE to determine what recovery steps should be followed.
the chassis is configured with one RAID I/O Module <b>and</b> it is online...	use the step " <u>RMP#3: Standard RAID I/O Module replacement.</u> " to install the replacement RAID I/O Module into the slot containing the I/O Module. Complete step " <u>RMP#1: Proactive RAID I/O Module removal.</u> " to remove the <i>Target RAID I/O Module</i> . Then install the I/O Module into it's slot.
the chassis is configured with one RAID I/O Module <b>and</b> the RAID I/O Module is offline...	complete step " <u>RMP#4: Offline Single RAID I/O Module removal and replacement.</u> "
none of the above statements are <b>exactly</b> true...	escalate this case to a more senior engineer.

## **RMP#1: Proactive RAID I/O Module removal**

- I. Connect to the Console Menu Interface via the serial interface (tip for Solaris) or via telnet.
- II. Fail the *Target RAID I/O Module* ( ):
  - a. From the Main Menu, select view and edit Peripheral devices, Set Peripheral Device Entry, Redundant Controller – Primary.
  - b. Select either force Primary controller failure, or force Secondary controller failure; whichever ever is appropriate.
- III. Verify that the Controller Status LED on the *Target RAID I/O Module* ( ) is solid amber, and the other controller is the acting Primary (its Controller Status LED is blinking green).
- IV. Remove all serial and Ethernet cables from the *Target RAID I/O Module* ( ). If necessary, connect the serial cable to the remaining (RAID) I/O Module.
- V. Unscrew the two captive screws, then remove the *Target RAID I/O Module* ( ).

## **RMP#2: Offline RAID I/O Module removal**

- I. Verify that the Controller Status LED on the *Target RAID I/O Module* ( ) is solid amber, and the other controller is the acting Primary (its Controller Status LED is blinking green).
- II. Ensure all fibre cables attached to this I/O Module are labeled clearly. If they are not, write down which cables are connected to which ports.
- III. Remove all serial and Ethernet cables from the *Target RAID I/O Module* ( ). If necessary, connect the serial cable to the remaining (RAID) I/O Module.
- IV. Remove the *Target RAID I/O Module* ( ).

## **RMP#3: Standard RAID I/O Module replacement**

- I. Insert the *Replacement RAID I/O Module* into the slot that's appropriate for your scenario.
- II. The Controller Status LEDs on both controllers will show solid amber while the newly replaced controller comes on-line. The newly replaced RAID I/O Module will become the Secondary RAID I/O Module.
- III. Verify the RAID I/O Module firmware version of the newly replaced Secondary Controller matches the existing Primary Controller:
  - a. In the Console Menu Interface, press <Ctrl> w, and select the Secondary Controller.
  - b. From the Main Menu, select view system information.
    - i. Write down the Firmware Version of the Secondary RAID Controller.
  - c. In the Console Menu Interface, press <Ctrl> w, and select the Primary Controller.
    - i. Write down the Firmware Version of the Primary RAID Controller.
  - d. If the two versions don't match escalate this case to a more senior engineer.
- IV. Skip ahead to the procedure “**RMP#5: Check and Update the RAID I/O Module firmware versions**”.

## **RMP#4: Offline Single RAID I/O Module removal and replacement**

- I. Power off both PCUs on the RAID chassis.
- II. Ensure all fibre cables attached to this I/O Module are labeled clearly. If they are not, write down which cables are connected to which ports.
- III. Remove all serial and Ethernet cables from the *Target RAID I/O Module* ( ).
- IV. Remove the *Target RAID I/O Module* ( ).
- V. Insert the *Replacement RAID I/O Module* into the slot.
- VI. Install the serial and Ethernet cables to the newly replaced RAID I/O Module.
- VII. Power on both PCUs on the RAID chassis.

- VIII. Connect to the Console Menu Interface via the serial interface (tip for Solaris) or via telnet.
- IX. Restore the NVRAM configuration the the newly replaced RAID I/O Module:
- a. From the Main Menu, select system Functions, then Controller maintenance.
  - b. Select Restore nvram from disks, confirm Yes, press Return then press the Escape key.
  - a. Shutdown and reset the RAID Controller:
    - i. From the Main Menu, select system Functions, then Shutdown controller.
    - ii. Confirm Yes when prompted and Yes again when prompted to 'Reset Controller ?'.
- X. Verify with the customer that the settings under the following menus are correct. If they are not correct, escalate this case to a more senior engineer:
- a. view and edit Host luns (verify each channel's host LUN mappings).
  - b. view and edit Scsi channels (verify the host channel's SCSI IDs).
  - c. view and edit Configuration parameters, Communication Parameters, Internet Protocol (TCP/IP) (verify the IP address).
- XI. Continue on to the procedure “**RMP#5: Check and Update the RAID I/O Module firmware versions**”.

### **RMP#5: Check and Update the RAID I/O Module firmware versions**

- I. Verify the RAID Controller, PLD, and SES firmware of the newly replaced (RAID) I/O Module:
- a. From an attached host enter the command `/usr/sbin/sccli`.
- \*\*CAUTION:** Always ensure the serial number of the selected RAID chassis matches the RAID chassis to be checked. See item 2. at the beginning of this document if necessary.
- i. If more than one SE3x10s are attached to this host a list of the discovered chassis' will be displayed.
    - Select the chassis to be upgraded based on it's serial number:
  - ii. If only one RAID chassis was discovered, it will be automatically selected.
- b. Enter the sub-command show inquiry-data.
- i. The Revision line shows the RAID Controller's firmware version. Write it here (i.e. 3.27R):
- c. Enter the sub-command show ses.
- i. The top RAID I/O Module will show 2 in the Ch column and contain the chassis' serial number in the Chassis column.
  - ii. The bottom RAID I/O Module will show 3 in the Ch column and contain the chassis' serial number in the Chassis column.
  - iii. Write down the SES firmware version from the Rev column of the *Target RAID I/O Module* ( ) here:
  - iv. Write down the PLD firmware version from the PLD column of the *Target RAID I/O Module* ( ) here:
  - v. If any of the lines of the show ses output have an asterisk on them **AND** there is a statement at the end of the output that indicates a “firmware mismatch”, then the PLD and/or SES firmware for the (RAID) I/O Modules in the RAID and/or attached JBOD chassis' are not the same. Inform the customer that a maintenance window should be scheduled to upgrade or downgrade the appropriate firmware.
    - The PLD and SES firmware are contained in patch 113723 and the update procedure is outlined in step III below.

II. Determine if the RAID Controller, SES, and PLD firmware of the newly replaced RAID I/O Module need to be updated:

**\*\*NOTE:** Mandatory, proactive FIN I1078-1 mandates that all SE 3510s be running a minimum version of: RAID Controller firmware 3.27R, SES firmware 1040, and PLD firmware 1000.

a. If the RAID Controller, SES, and PLD firmware versions are not at the most current level, download the current version of patch 113723 from [http://sunsolve.sun.com/pub-cgi/retrieve.pl?doc=fpatches%2F113723&zone\\_32=113723&wholewords=on](http://sunsolve.sun.com/pub-cgi/retrieve.pl?doc=fpatches%2F113723&zone_32=113723&wholewords=on)

**i. Skip ahead to step III.**

b. If the RAID Controller, PLD, and SES firmware are correctly matched and at the desired revision, this procedure is complete, **DO NOT EXECUTE ANY REMAINING STEPS.**

III. To update the appropriate firmware: From an attached host enter the command `/usr/sbin/sccli`.

**\*\*CAUTION:** Always ensure the serial number of the selected RAID chassis matches the RAID chassis to be updated. See item 2. at the beginning of this document if necessary.

a. If more than one SE3x10s are attached to this host a list of the discovered chassis will be displayed.

i. Select the chassis to be upgraded based on its serial number:

a. If only one RAID chassis was discovered, it will be automatically selected.

IV. To download RAID I/O Module firmware to both RAID I/O Modules:

a. Use the command `cd` to change into the patch subdirectory.

b. Enter the sub-command: `download controller-firmware SUN327"X"-3510.bin`

i. Where `SUN327"X"-3510.bin` represents the name of the firmware file (replace "X" with the actual version).

V. To download PLD firmware to all RAID and JBOD I/O Modules:

a. Use the command `cd` to change into the patch subdirectory.

b. Enter the sub-command: `download pld-firmware pld1r"XX".s3r`

i. Where `pld1r"XX".s3r` represents the name of the firmware file (replace "XX" with the actual version).

VI. To download SES firmware to all RAID and JBOD I/O Modules:

a. Use the command `cd` to change into the patch subdirectory.

b. Enter the sub-command: `download ses-firmware fc2u_sun "XXXX" a.s3r` (note underscores).

i. Where `fc2u_sun "XXXX" a.s3r` represents the name of the firmware file (replace "XXXX" with the actual version).

## **How to replace an I/O Module in a JBOD or RAID Chassis:**

A. Find the **Target Chassis Serial Number** by using step 2. B. at the beginning of this document.

I. Write it down here:

B. Write down the slot position (top or bottom) of the *Target I/O Module* here:

**C. If the Target I/O Module is in a JBOD that is connected to, or is installed in, a RAID chassis:**

I. Inform the Customer that you are about to save the current NVRAM configuration to the chassis' disks.

a. In the Console Menu Interface: from the Main Menu, select system Functions, then Controller maintenance.

b. Select Save nvrाम to disks, confirm Yes when prompted, then press the Escape key.

II. Ensure there is at least one active path to all of the disk drives in the RAID and all JBOD chassis':

a. From the Main Menu, select view and edit scsi Drives.

b. Ensure every disk drive that is installed in the RAID chassis and any attached JBODs has at least one channel listed in the Chl column.

i. **Escalate this case to a more senior engineer if :**

- Any disk drives are **not** listed that are physically installed, - or -
- Any disks are listed but don't display any channels listed in the Chl column.

c. Skip ahead to step E. below.

#### **D.If this JBOD is directly connected to a host(s):**

I. Before continuing on to step E. below, verify with this customer that all hosts that access this JBOD have a least two viable paths to each disk drive **or** that all services that rely on this JBOD have been stopped. Failure to do so may result in the unexpected loss of access to the customer's data and services.

E.Ensure all fibre cables attached to this I/O Module are labeled clearly.

F. Write down which cables are connected to which ports.

G.Remove all fibre cables attached to the I/O Module.

H.Unscrew the two captive, thumb screws and remove the module from the chassis.

I. Fully insert the replacement I/O Module then tighten the thumb screws until they are finger tight.

J. Reinstall all fibre cables in their original positions.

K.Use the following command line shell script to verify the SES and PLD firmware of the new I/O Module:

I. From an attached Solaris host, type the following commands, pressing <Return> after each one:

a. ksh

b. for EACH in `ls -l` (note the two “back single quotes”)

c. do

d. /usr/sbin/sccli --list /dev/es/\$EACH

e. done

II.In the output, two device files will contain the chassis serial number (SN#) of the *Target Chassis*

a. Write them down here: /dev/es/ses

/dev/es/ses

III. Execute /usr/sbin/sccli /dev/es/sesX show ses once for each of the two files in II.a. above.

a. For example: /usr/sbin/sccli /dev/es/ses show ses, then

/usr/sbin/sccli /dev/es/ses show ses.

b. The top I/O Module will show loop (a) in the WWPN column.

c. The bottom I/O Module will show loop (b) in the WWPN column.

i. The SES firmware version is listed in the Rev column and the PLD firmware version is listed in the PLD column.

ii. Write down the two versions for the *Target I/O Module* ( ) here: SES: PLD:

iii. Write down the two versions for the other I/O Module here: SES: PLD:

IV.If the revision of the PLD and/or SES firmware on the two I/O Modules is a chassis are not the same, inform the customer that a maintenance window should be scheduled to upgrade the appropriate firmware.

a. The PLD and SES firmware are contained in patch 113723.

b. This procedure is outlined in “RMP#5: Update the RAID I/O Module firmware” of the “How to replace a RAID I/O Module:” procedure.

### **How to replace a Battery Module:**

\*\*NOTE: With RAID Controller firmware 3.27R and above, and sccli version 1.5.0 and above the battery installation date (the beginning of the battery's service life) will be updated automatically.

A.Remove all serial and Ethernet cables from the *Target RAID I/O Module*.

B.Remove and replace the battery module.

C.Re-install all serial and Ethernet cables to the *Target RAID I/O Module*.

## How to replace a PCU:

- A. On the chassis that houses the PCU to be replaced:
  - I. If the status LED on the PCU that is **NOT** going to be replaced is solid amber, escalate this call to a more senior engineer.
- B. Power off the **Target PCU** (the one to be replaced) and remove its power cord.
- C. Remove the **Target PCU** and install its replacement.
- D. Install the power cord in the replacement PCU and power it on.

## How to replace an expansion JBOD fibre cable or a drive-side SFP:

- \*\*CAUTION:** If FRUs on multiple channels are to be replaced, complete all FRU replacements on a single channel before restarting the entire procedure for the next channel.
- \*\*NOTE:** FCO A0237-2 mandates that all JBOD fibre cables (0.5M) labeled with the designator **TCC** be replaced with cables labeled **BIZ**. See this FCO for further details.
- A. While viewing the **Target Chassis** (the chassis that contains the FRU to be replaced) from the rear, follow the fibre cabling (if applicable) from the **Target SFP or Fibre Cable** (the FRU to be replaced) to the RAID chassis.
    - I. Write down **Target Channel** number, which is the fibre drive channel (on the RAID chassis) that the **Target SFP or Fibre Cable** is connected to (i.e. 2):
    - II. Write down the **Supporting Channel** number, which is the fibre drive channel that also connects expansion JBODs to the RAID chassis along with the **Target Channel** (i.e. 3):  
**\*\*NOTE:** Drive channels 2 and 3 always support each other.
  - B. Use the following table to determine the number of drive-side devices on each loop, in this configuration.

<u>Disk Drives:</u>	<b>Maximum 12 per chassis.</b>	Count number of <b>Drive</b> LEDs on the front of each chassis.
<u>RAID Controllers:</u>	<b>Maximum 2 per configuration.</b>	Examine back of the RAID chassis. If a Module has six SFP ports on it, it has a RAID Controller, if it has only two SFP ports, it does not.
<u>SES Devices:</u>	<b>One per chassis.</b>	Count the total number of chassis' in the configuration.

- C. Write down the number of drive-side devices on each loop, in this configuration.
  - I. Disk Drives:
  - II. RAID Controllers:
  - III. SES Devices:
- D. Write down the **total** number of drive-side devices on each loop, in this configuration by adding all of the devices you wrote down in step C. above:
- E. From an attached host enter the command `/usr/sbin/sccli`.  
**\*\*CAUTION:** Always ensure the serial number of the selected RAID chassis matches the RAID chassis to be checked. See item 2. at the beginning of this document if necessary.
  - I. If more than one SE3x10s are attached to this host a list of the discovered chassis' will be displayed.
    - a. Select the chassis to be upgraded based on it's serial number:
  - II. If only one RAID chassis was discovered, it will be automatically selected.
- F. Execute the sub-command `show loop-map channel X` for the **Supporting Channel**.
  - I. For example: `show loop-map channel _____`.
  - II. From the top of the output, write down the number of "**devices found in loop map**" (i.e. 28):

- G. **\*\*CAUTION:** If the number of disk-side devices physically present, \_\_\_\_\_, **DOES NOT** equal the number disk-side devices present in the loop map for the *Supporting Channel*, \_\_\_\_\_, **DO NOT PROCEED WITH THIS FRU REPLACEMENT** and escalate this case to a more experienced engineer.
- H. If the number of devices physically present, \_\_\_\_\_, equals the number on the *Supporting Channel* loop map, \_\_\_\_\_; continue on to step I.
- I. Perform the entire following procedure for each FRU to be replaced:
- \*\*NOTE:** If multiple FRUs (fibre cables or SFPs) on the same channel are to be replaced, start with the FRU that is furthest from the attached RAID chassis, and continue with the next furthest, etc.
- I. Execute the sub-command show loop-map channel X for the *Supporting Channel*.
    - a. For example: show loop-map channel \_\_\_\_\_.
    - b. **CAUTION:** If the number of "*devices found in loop map*" (from the top of the output) is not the same as in step F. above ( \_\_\_\_\_ ) **DO NOT PROCEED WITH THIS FRU REPLACEMENT** and escalate this case to a more experienced engineer.
  - II. Disconnect any intervening fibre cables (if needed) and remove the *Target SFP or Fibre Cable*.
  - III. Install the replacement SFP or fibre cable and reconnect any intervening fibre cables.
  - IV. Execute the sub-command show loop-map channel X for the *Supporting Channel*.
    - a. For example: show loop-map channel \_\_\_\_\_.
  - V. **CAUTION:** If the number of "*devices found in loop map*" (from the top of the output) is not the same as in step F. above ( \_\_\_\_\_ ) immediately escalate this case to a more experienced engineer.

## **How to replace a Midplane/Chassis:**

- \*\*NOTE:** All I/O must be stopped before beginning the replacement procedure. Verify with the customer that all I/O to the affected RAID chassis and any attached JBODs has been stopped.
- A. Inform the Customer that you are about to save the current NVRAM configuration to the chassis' disks.
    - I. In the Console Menu Interface: from the Main Menu, select system Functions, then Controller maintenance.
    - II. Select Save nvram to disks, confirm Yes when prompted, then press the Escape key.
  - B. Connect to the Console Menu Interface via the serial interface (tip for Solaris) or via telnet.
  - C. If the **Target Chassis** (the one to be replaced) is a RAID (not a JBOD) chassis:
    - I. From the Main Menu, select view and edit Configuration parameters, then Controller Parameters.
    - II. Write down the Controller Unique Identifier(hex) - value here:
  - D. Power off both PCUs on the *Target Chassis*.
  - E. Ensure all fibre cables attached to this chassis' (RAID) I/O Module are labeled clearly. If they are not, write down which cables are connected to which ports.
  - F. Remove all fibre cables attached to the (RAID) I/O Modules.
  - G. If the *Target Chassis* is a RAID (not a JBOD) chassis:
    - I. Remove all serial and Ethernet cables connected to the RAID I/O Modules.
  - H. Label each disk drive with its disk slot position in the chassis.
  - I. Remove the I/O Modules, PCUs, and disk drives from the *Target Chassis*.
  - J. Remove the *Target Chassis* chassis.
  - K. Install the **Replacement Chassis** chassis.
  - L. Re-install all previously removed FRUs in their original positions into the *Replacement Chassis*.
  - M. Re-install all fibre, serial, Ethernet, and power cables in their original positions.
  - N. Power on both PCUs on the *Replacement Chassis*.
  - O. If the *Replacement Chassis* is a RAID chassis:
    - I. Connect to the Console Menu Interface via the serial interface (tip for Solaris) or via telnet.
    - II. From the Main Menu, select view and edit Configuration parameters, then Controller Parameters.

- III. Select Controller Unique Identifier(hex) -, set it to the appropriate value, as described in step a. **OR** in step b. then press Return:
- a. If this chassis is being used by clustered hosts, or for any other reason its attached hosts require that their Device IDs remaining consistent; set Controller Unique Identifier(hex) - to the value you wrote down in Step C. above
    - i. Shutdown and reset the RAID Controllers:
      - From the Main Menu, select system Functions, then Shutdown controller.
      - Confirm Yes when prompted and Yes again when prompted to 'Reset Controller ?'.
      - **\*\*This procedure is complete. DO NOT continue on to step c. below.**
    - b. If the statement in step a. above IS NOT true, set Controller Unique Identifier(hex) - to 0.
      - i. Shutdown and reset the RAID Controllers:
        - From the Main Menu, select system Functions, then Shutdown controller.
        - Confirm Yes when prompted and Yes again when prompted to 'Reset Controller ?'.
      - ii. From the Main Menu, select view and edit Configuration parameters, then Controller Parameters.
        - If the Controller Name – parameter contains a value similar to the previous chassis serial number , continue with the following steps:
        - From the Main Menu, select view and edit Configuration parameters, then Communication Parameters, and Internet Protocol (TCP/IP).
        - Write down the last four digits of the new MAC address, not including the colon between them (These will also be the last four digits of the *Replacement Chassis's* chassis serial number). For Example: 00:C0:FF:80:**05:63**, would be **0563**. **MAC address:**
        - From the Main Menu, select view and edit Configuration parameters, then Controller Parameters.
        - Select Controller Name –.
          - Modify the value to include the new chassis serial number , and press Return.

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Inquires and especially corrections to [alex.arnoldy@sun.com](mailto:alex.arnoldy@sun.com) su: FRU How To Guide