DDN StorageScaler7000
IBM Field Replacement Instructions.

CAUTION: Anti-tip plates must be firmly attached to the bottom of the rack to prevent the rack from tipping over when the drawers are pulled out of the rack.

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1. Anti tip plate should have been installed at the time of rack installation. If it is not present, it must be installed prior to sliding any equipment forward out of the rack. See figure 1 anti tip plate image. Ensure leveling pads are fully engaged to the floor to prevent rack from moving during service activity.

Figure 1 Anti tip plate.

2. Remove Rack Door from hinges and set aside.
3. Use ladder that has shipped with the DDN 45 U Rack to aid in removal and replacement when the position is above a manageable height.
4. Ensure The Enclosure has been properly powered down and power cables have been removed from the enclosure.
5. Take note as to where ALL IO Cables are currently plugged into the enclosure prior to unplugging them for ease of reinstallation. See example below in figure 2. Carefully unplug I/O cabling from the rear of the enclosure in preparation for enclosure removal.

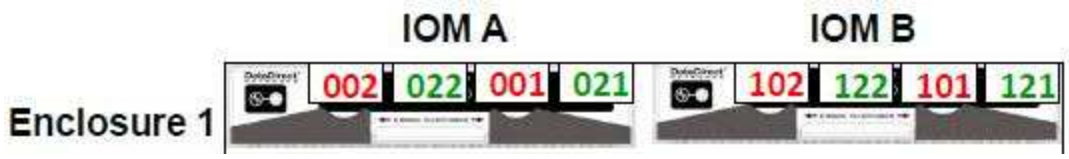


Figure 2

6. Remove Cable management hardware from the rear of the enclosure in preparation for enclosure removal. Retain all hardware removed for reinstallation on replacement enclosure. See figure 3.

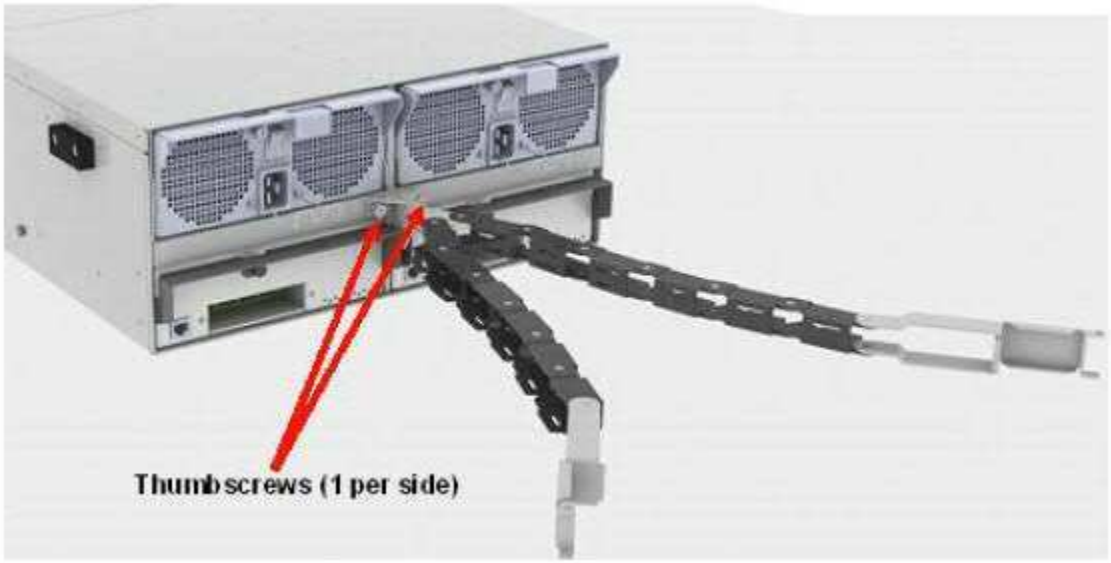


Figure 3

7. Squeeze the release tabs together on the front of the StorageScaler7000 enclosure (Figure 4) and carefully pull it forward out of the rack until the green rail tabs engage.

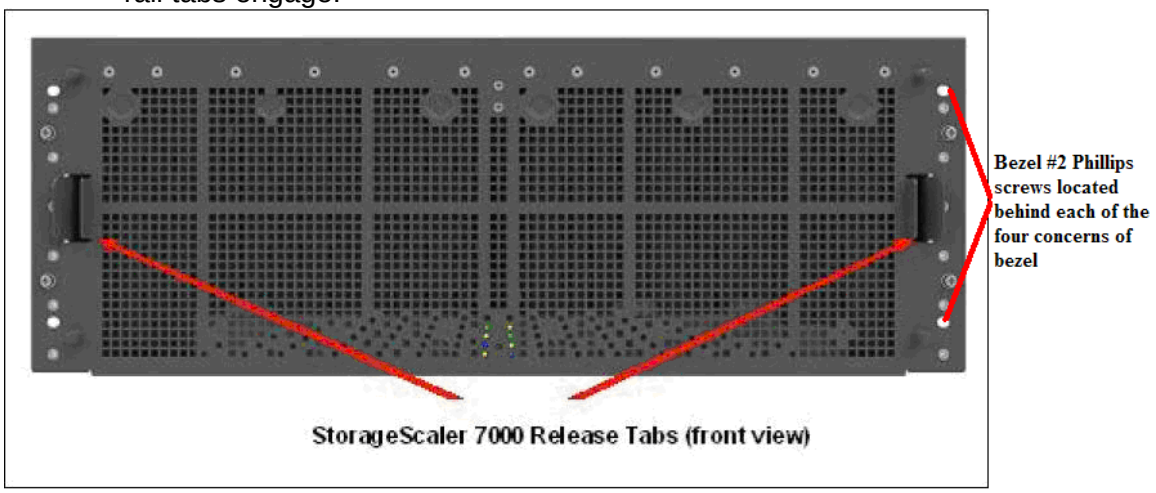


Figure 4

8. Pull the enclosure out far enough to allow the top access panels to be opened. The rails will 'lock' into a service position (Figure 5).

9. Remove the enclosure front bezel by unscrewing the four #2 Phillips screws located behind each of the four concerns making sure to safeguard these parts for reinstallation onto replacement enclosure. Figure 4.

Figure 5

10. Open the top Covers:
    - Press the release buttons on the top cover release handles (Figure 6).
    - Pull up on the release handles (Figure 7.)

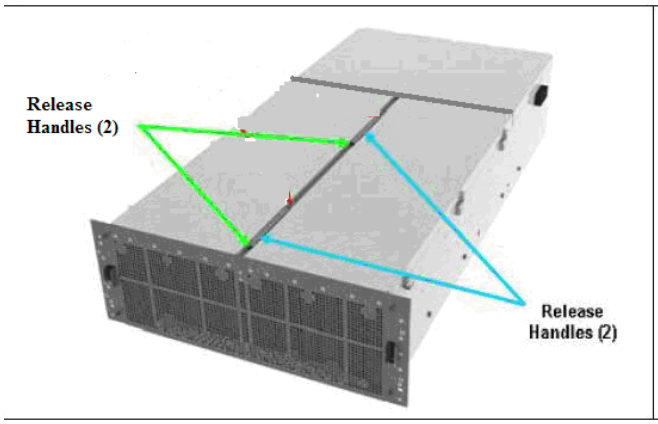


Figure 6

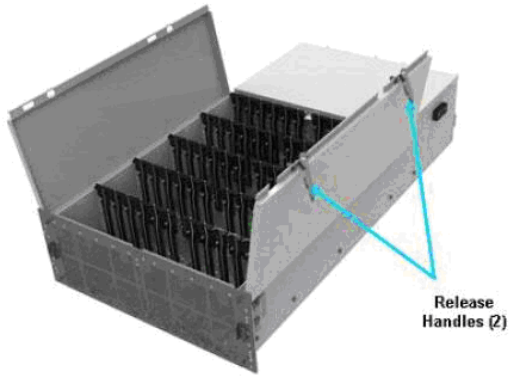


Figure 7.

⚠ **Caution**: Ensure that disk drives are at room temperature before installing and powering up the StorageScaler 7000. It is recommended that drives are allowed at least two hours to acclimate to room temperature before using them.

⚠ **Caution**: When handling disk drives, be sure to take static precautions (wrist straps, grounded ESD mat, etc.)

11. ALL DRIVES MUST BE REMOVED from the enclosure prior to removing the enclosure from the rack. All drives should be labeled with removable tape (console tape is recommended) per Figure 8 below to preserve array integrity prior to removing the enclosure from the rack. In the event of multiple enclosures replacement. Be sure to label the drives with the enclosure they were removed from. NOTE: **writing on drive module will void warranty.**

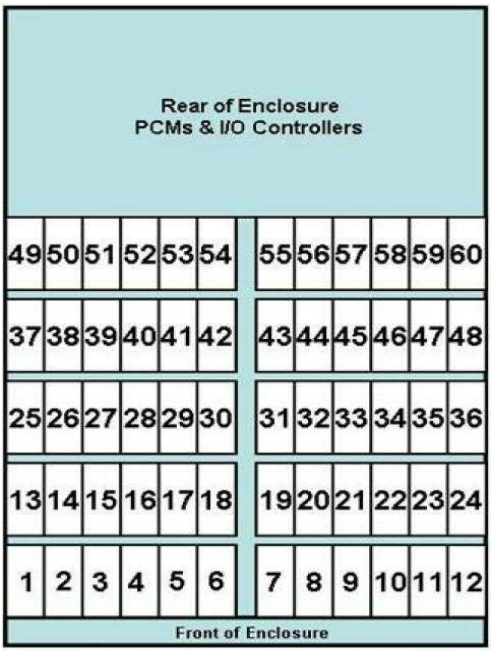


Figure 8

12. Remove all installed drives by pressing the release catch (Figure 9) on the drive carrier to release the handle (Figure 10) and carefully slide the drive out of the enclosure slot. Repeat this for all installed drives.

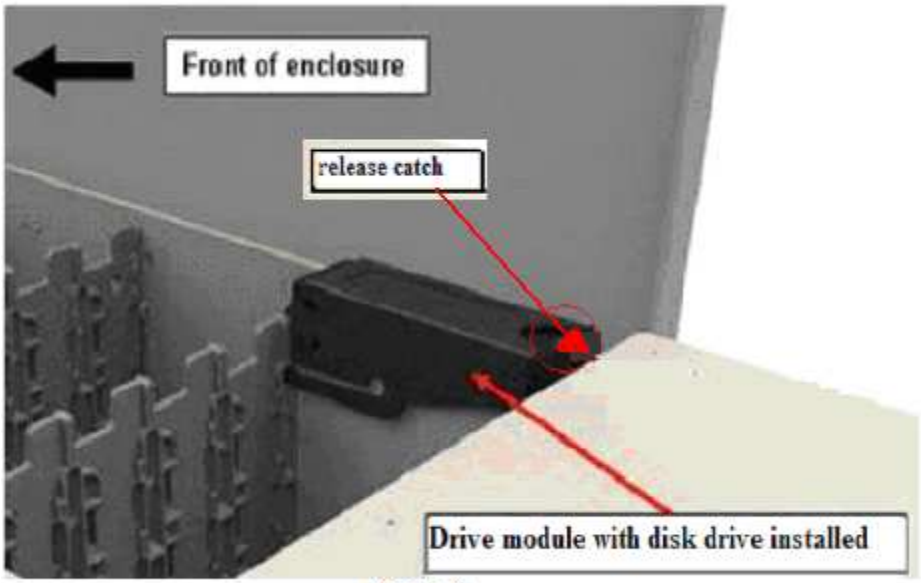


Figure 9

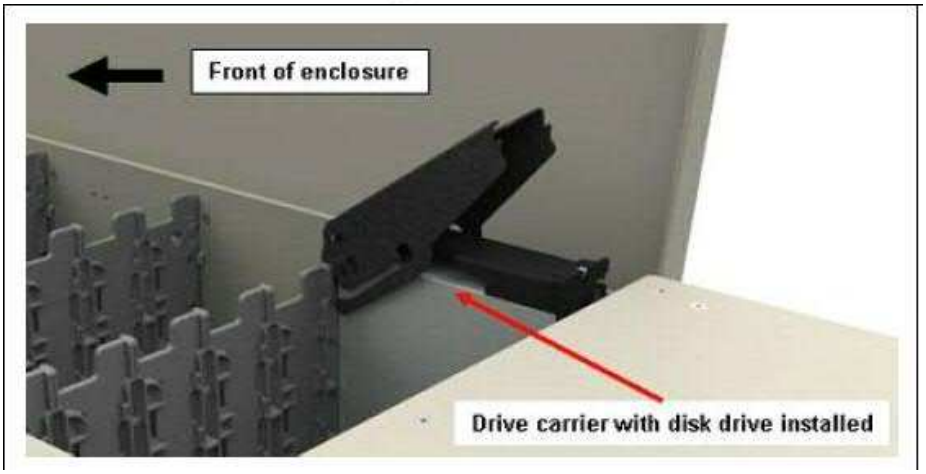


Figure 10

13. Store the drives in an area so that they remain acclimated to room temperature. Drives and mew replacement enclosure must be acclimated to the same room temperature before drives can be reinstalled into the replacement enclosure.
14. Carefully position the lift tool in front of the rack (Figure 11 and 15) and raise the load plate up under the enclosure to be removed so that the load plate is now supporting the enclosure... Ensure the foot brake is applied and secure in position. See figure 12.
15. Use step ladders supplied with the FRU enclosure for upper rack U locations as needed.

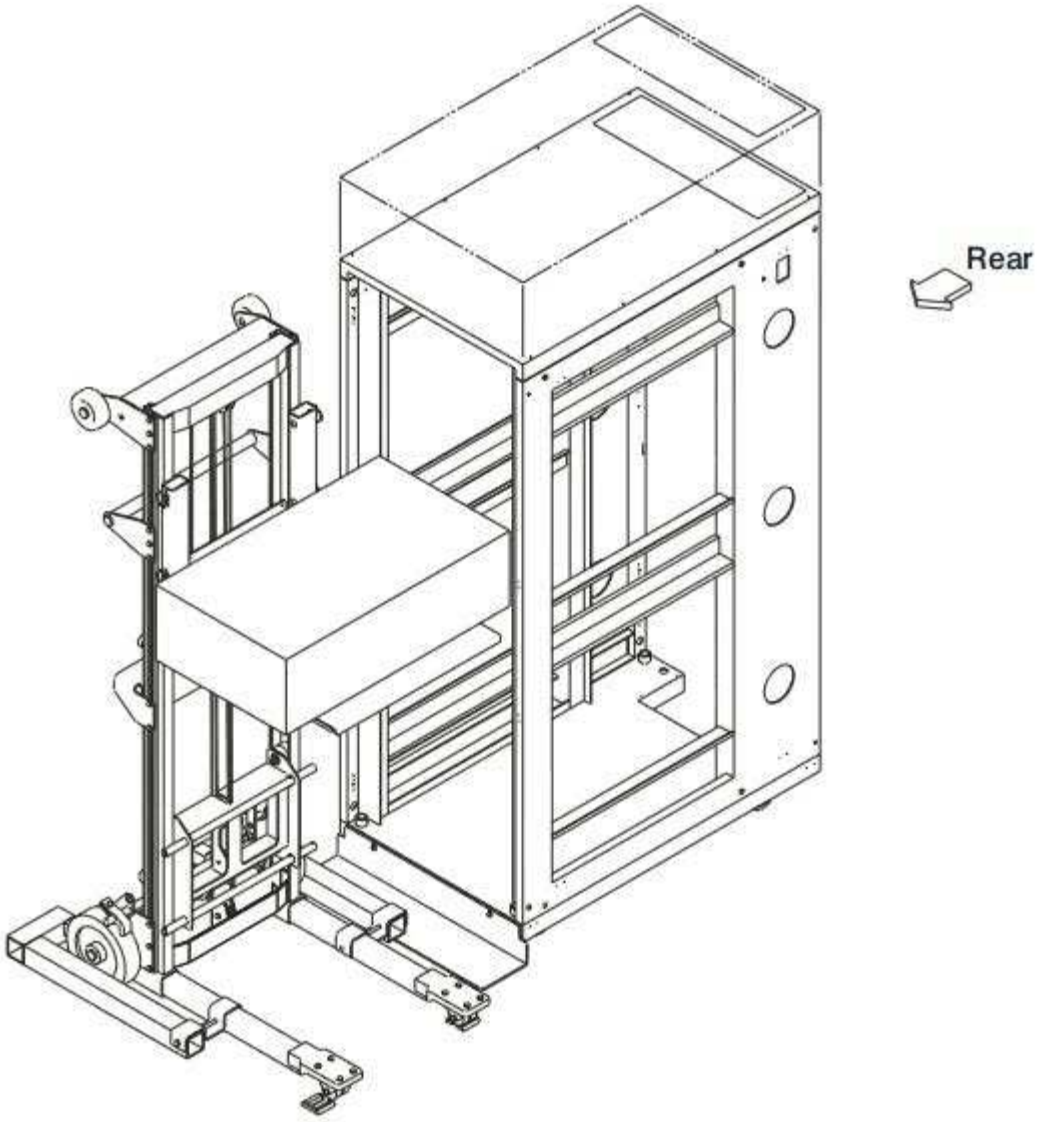


Figure 11

Figure 12

16. Carefully disengage the enclosure rails from the rack rails by depressing the rail tab and slide the rack rail back into the rack (Figure 13). The StorageScaler7000 Enclosure is now dismounted from the rack. Adjust Load plate up and down as necessary for east of enclosure removal.

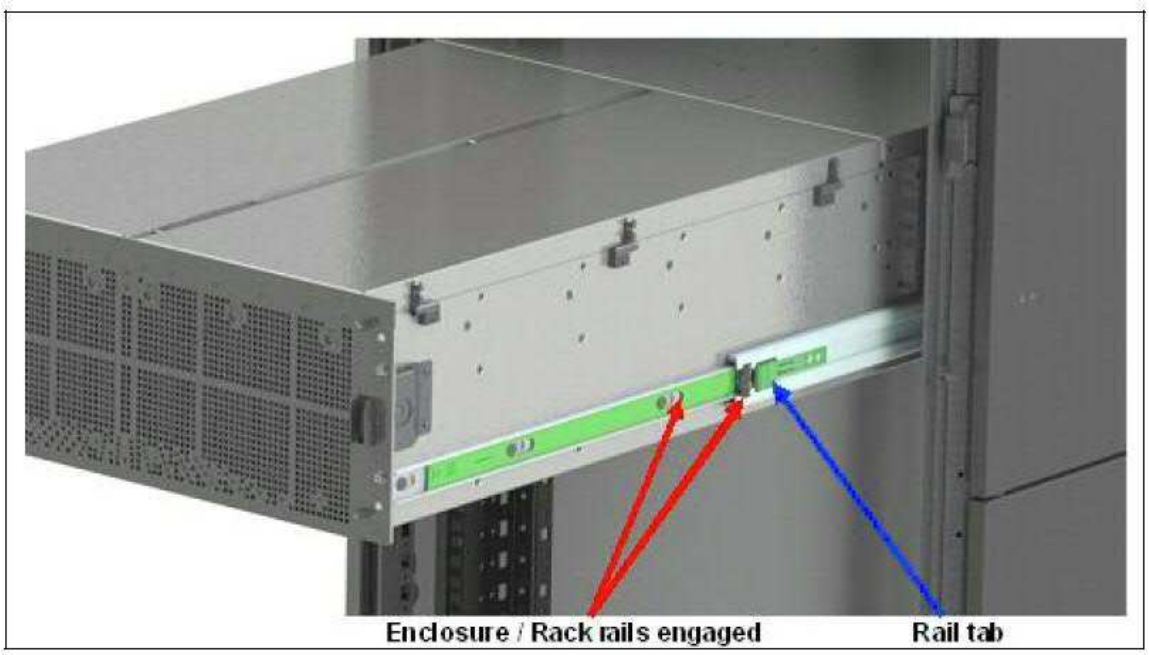


Figure 13

17. To assist in releasing the rails from the enclosure, go to back of rack and slide tabs up or down then pull rails towards rack rear. See figure 14.

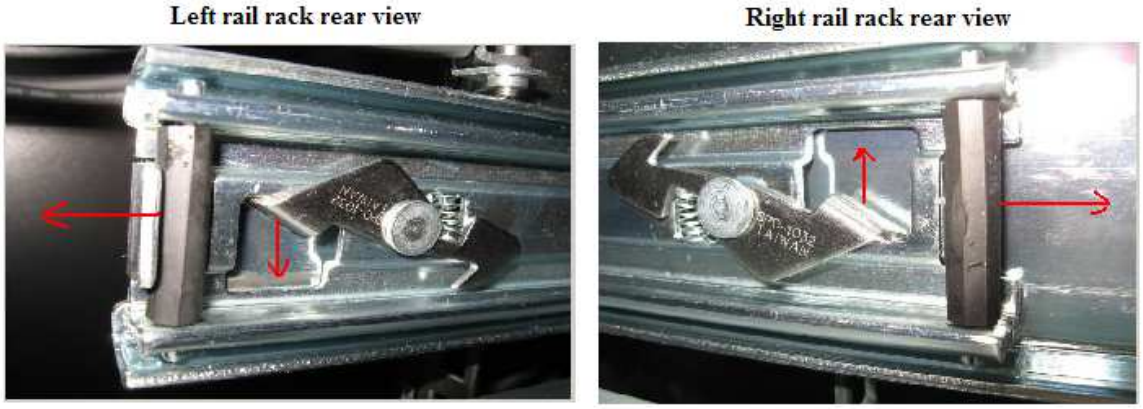


Figure 14

18. Ensure you have the enclosure positioned on the lift tool to support the rear side, which will be heavier that the front side with drives removed.
19. Lower the load plate and enclosure to a manageable height where it can be secured by holding it in place for transport.
20. Remove enclosure from load plate and set aside for return repackaging.
21. Remove the enclosure side rails from the unit that just removed and reinstall them to the new replacement unit using existing mounting hardware.
22. Move new replacement chassis to lift tool load plate and position it for ease of installation. Secure by holding while transporting.
23. Carefully position the lift tool in front of the rack (Figure 11 and 15) and raise the load plate and enclosure up into position for installation. Ensure proper lift tool alignment (Figure 15) and break is reset when you start to raise the load.

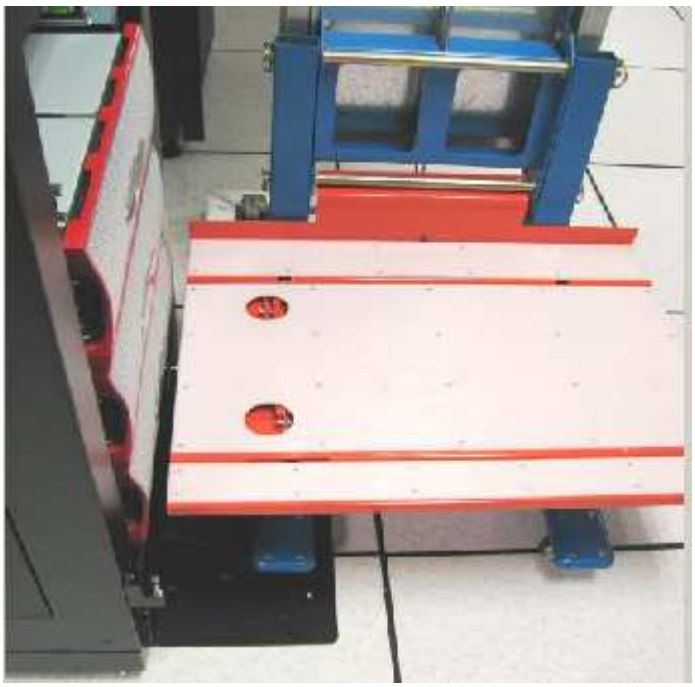


Figure 15

24. Align enclosure rails with rack rails. Carefully engage the enclosure rails into the rack rails and slide the enclosure in until the green enclosure rail tabs 'click' into place (Figure 16). The StorageScaler7000 Enclosure is now mounted in the rack.

Figure 16

25. With the lift tool load plate in place no more than 2 inches below the enclosure press the green tabs on each rail and push the enclosure into the Rack to its installed and seated position.
26. Slide the enclosure out again to ensure it can slide out properly. Reinstall the front bezel removed in step 8 above.

NOTE: The StorageScaler7000 enclosure has an automatic locking feature when pushed all the way into the rack. No screws are needed to secure the enclosure.

⚠ **Caution**: Ensure that disk drives are at room temperature before installing and powering up the StorageScaler 7000. It is recommended that drives are allowed at least two hours to acclimate to room temperature before using them.

⚠ **Caution**: When handling disk drives, be sure to take static precautions (wrist straps, grounded ESD mat, etc.)

Installing disk drive carriers into the enclosure

27. Ensure the disk drives are at room temperature.

28. To install a drive, press the release catch on the drive carrier to release the handle and carefully slide the carrier/drive assembly into the slot (Figure 10).

29. Continue to slide the drive carrier into the selected slot until it contacts the baseboard and begins to engage the handle. Carefully press down on the handle until it latches which will cam the drive carrier into place (Figure 9).
30. Repeat steps 18 and 19 for all remaining drives back into their original location as previously labeled in step 8.
31. Reinstall cable management hardware preciously removed in step 4.

32. Reinstall all cables previously removed in step 3.
33. Refer to **StorageScaler7000 Installation and User Guide** for instructions for proper Power-Up Procedure. Select Drive Enclosures SS7000 Series from the attached web link.
    http://www.ddn.com/support/product-downloads-and-documentation

Appendix A Safety Notices and Cautions

Safety Notices

Caution: Before touching any of the enclosure components, ground yourself and take antistatic precautions. Use an antistatic wrist strap and a grounding wire as a minimum precaution.

Caution: Each storage subsystem must have a good electrical ground connection through each power cord, through the building power grid to the point of origin for the building power source entry.

Caution: Circuit overloading – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate
ratings should be used when addressing power concerns.

NOTE: The maximum current draw is printed on a label on each of the StorageScaler7000 PCMs (Power and Cooling Modules).

200-240V 12.4A per PCM,

2 PCMs per StorageScaler 7000.

DDN SFA10000 Storage Controller, SFA12K-40 InfiniBand Based Storage Controller and UPS

IBM Field Replacement Instructions.

This document is a guide on how to replace a DDN SFA10000 controller and UPS unit in a rack.

Please refer to Appendix B for Pre and Post removal preparation of SFA 10000 controllers for FA OS version 1.4.2

CAUTION: Anti-tip plates must be firmly attached to the bottom of the rack to prevent the rack from tipping over when the drawers are pulled out of the rack.

Anti tip plate should have been installed at the time of rack instillation. If it is not present, it must be installed prior to sliding any equipment forward out of the rack. See figure 1 anti tip plate image. Ensure leveling pads are fully engaged to the floor to prevent rack from moving during service activity.

Figure 1 Anti tip plate.

Removing Controller from the rack.

1. Remove Rack Door from hinges and set aside
2. Ensure The Controller has been properly powered down and power cables have been removed from the enclosure.
3. Take careful notes as to where all cables are plugged. Ethernet, Fiber, InfiniBand and USB cables. This will help during reinstallation. SAS and SATA Examples are shown in figure 2 below. Remove all Cables from the rear of the enclosure and secure in a place to prevent damage during controller removal in installation.

SAS EXAPLE

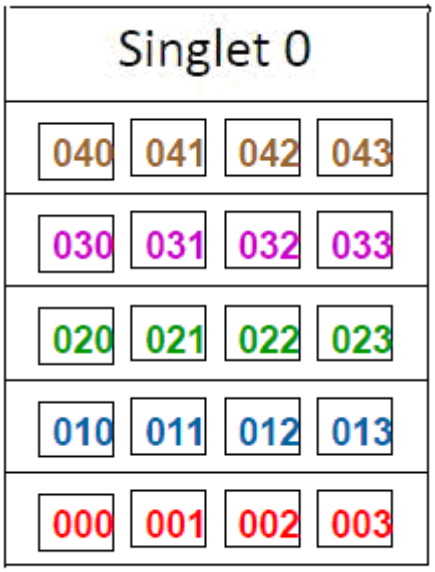
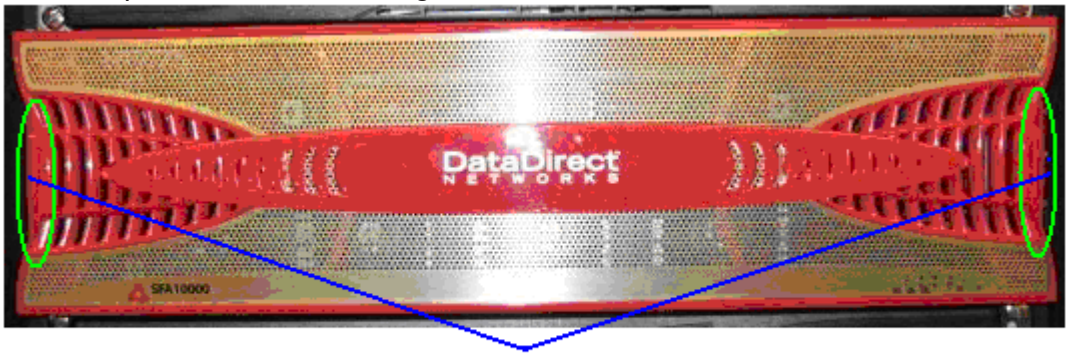


Figure 2

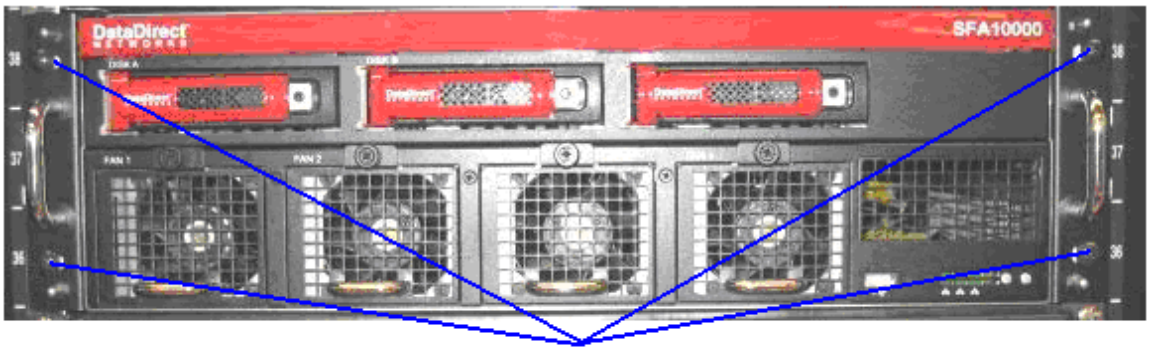
4. Remove Controller front Bezel by gently pulling it from the sides away from the front of the controller assembly. Save for reinstallation on to new replacement unit. See figure 3.



Gently pull both sides to remove bezel.

Figure 3

5. Remove the four screws that secure the Controller front side to the rack. See figure 4.



Four Front Side Securing Screws

Figure 4

6. Slide the Controller out from the rack to the point that the slide rails click on each side and lock into place.

7. Carefully position the lift tool in front of the rack (Figure 5) and raise the load plate up under the enclosure to be removed so that the load plate is now supporting the enclosure. Ensure the foot brake is applied and secure in position. See figure 6.

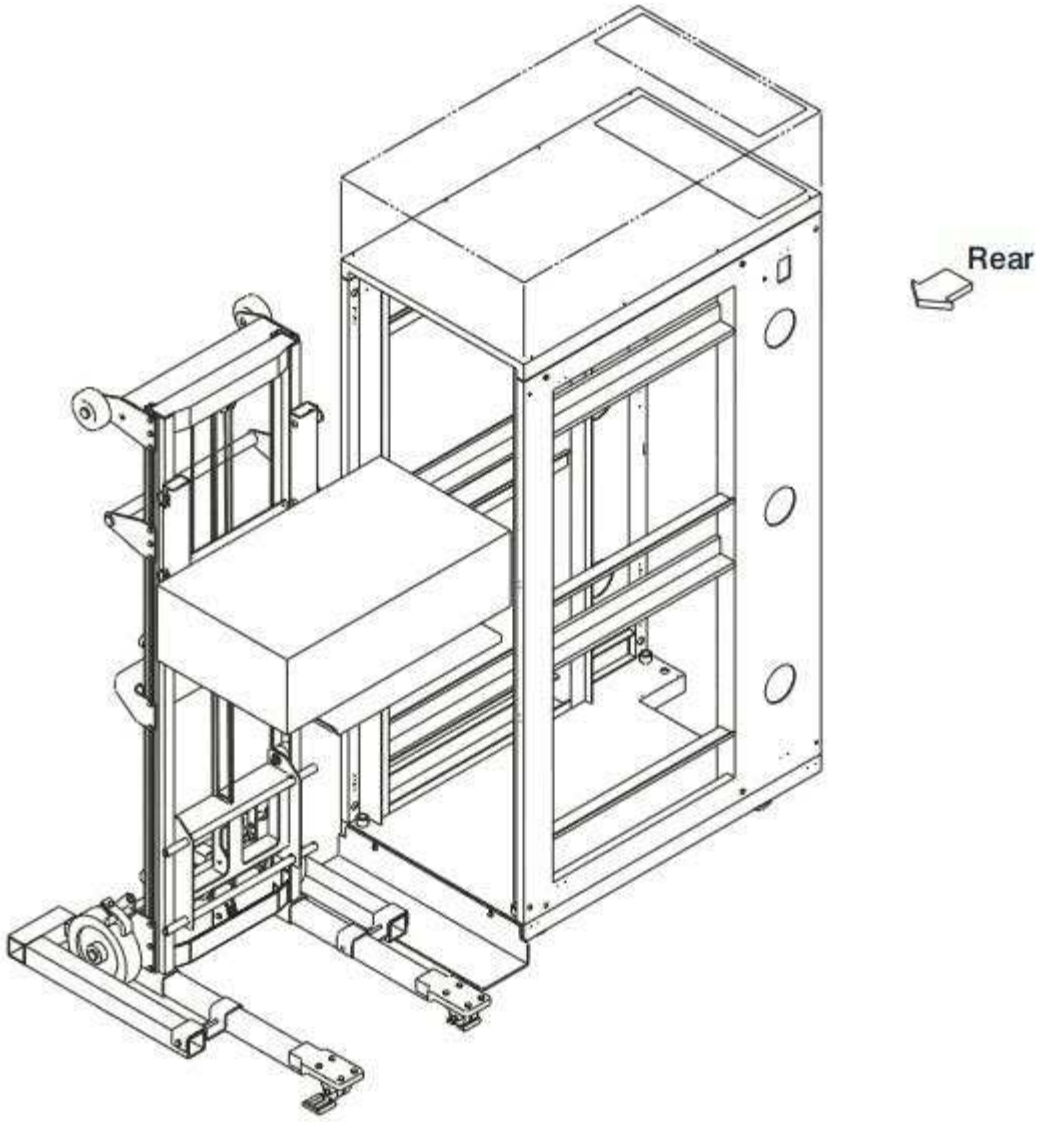


Figure 5

Figure 6

8. With one person on each side of the controller press the side rail tabs as indicated in figure 7 forward in the direction of the arrow. This will enable of release the controller rails from the rack rails by sliding the controller forward away from the rack.

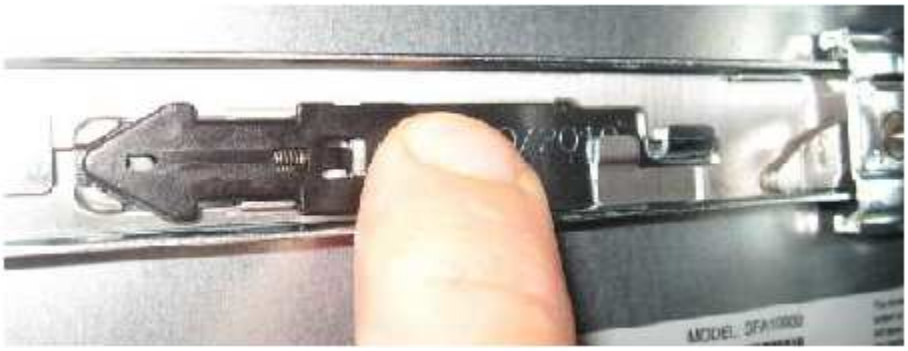


Figure 7

9. Slide the controller forward until the controller rails are disengaged from the rack rails. The controller is now removed and ready to be packaged for return.
10. Prepare the new controller for installation by removing the side rails from the old unit and installing them on the new unit.
11. With the new controller on the lift tool load plate carefully raise it into position so that the controller rails can engage with the rack rails as was seen in steps 9 and 10.
12. Slide the controller rails into the rack rails by carefully aligning them and sliding the controller inward towards the rack until they click into the locked position.

13. Lower the lift tool load plate SLOWLY approximately 2 inches ensuring the controller rails and rack rails remain engaged and that the controller is now properly supported.
14. Before the load Plate is removed slide the new controller back into the rack with the load plate still in place 2 inches below the controller. Once fully inserted into the rack remove lift tool from in front of the rack and install screws and bezel removed in steps 4 and 5 above.

15. Installation is now complete.

16. Refer to **SFA10000/10000E Users Guide** instructions for proper Power-Up Procedure. Select Drive Enclosures SS7000 Series from the attached web link.

http://www.ddn.com/support/product-downloads-and-documentation

UPS REPLACEMENT

1. Ensure The UPS has been properly powered down.
2. Remove AC power and USB cables from the UPS Figure 1.

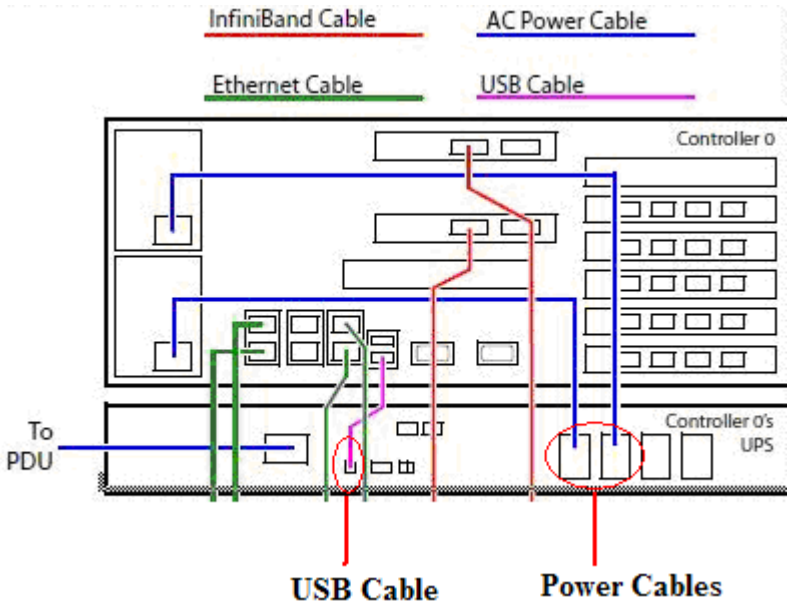


Figure 1

3. Remove the two front side screws one on each side of the UPS from the UPS and slide the UPS out from the rack front side off of the stationary rack rails. Figure 2.

Figure 2

4. UPS is now removed.
5. Reinstall the new UPS by sliding it into the rack on to the rack stationary rails.
6. Install the screws removed in Step 3 above
7. Reinstall the cables removed in step 2 above.
8. Refer to **SFA10000/10000E Users Guide** instructions for proper Power-Up Procedure.
   http://www.ddn.com/support/product-downloads-and-documentation

Appendix B

SFA 10000 and SFA 12K-40 controller replacement for SFA OS version 1.5.1

If, during the course of SFA 10000 or SFA 12K-40 problem determination, authorized support channels determine that a controller is faulty and must be replaced, use the procedure below to perform SFA controller replacement.

Step 1: Secure a copy of the firmware file of currently installed SFAOS firmware version

It is best practice to obtain the SFA controller firmware image file matching the currently installed version on the controller to be replaced. Firmware images can be requested from the SFA authorized support contacts.

Step 2: Verify the physical location of controller to be replaced

If the controller to be replaced is responsive to CLUI commands, log into the controller via ssh and run the command "locate controller local". This will blink the identify LED on the controller. The duration of the identify LED blink period is configurable, and by default the duration is two minutes. The SFA OS “subsystem locate_dwell_time” setting is configurable and may not be set to default. It is possible to verify the current locate dwell time by running the command "show subsystem all" as shown below.

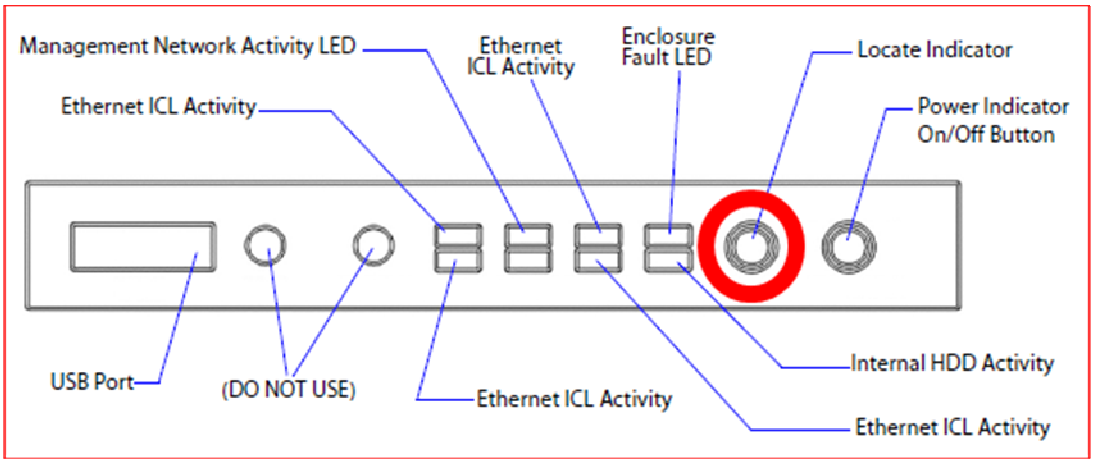
```
show subsystem all

********************
*     Subsystem    *
********************

RP Subsystem Name:      SFA
UID:                    60001ff0802bd000000000030000000
Subsystem Time:         Sat Jan  1 00:00:00 2011
Locate Dwell Time:      120 seconds
Fast Timeout:           OFF
Pool Verify Policy:     ENABLED
NTP Mode:               OFF
Drive Error Tolerance:  HIGH
Single Controller WB:   ENABLED
```

It is possible to increase the locate dwell time if more time is needed in cases where the equipment is physically located at a distance from the console where the locate command will be executed. Refer to the figures below and the SFA 10000 or SFA 12K-40 user guides for more information on the controller's Identify LED and locate command.

SFA 10000



SFA 12K-40

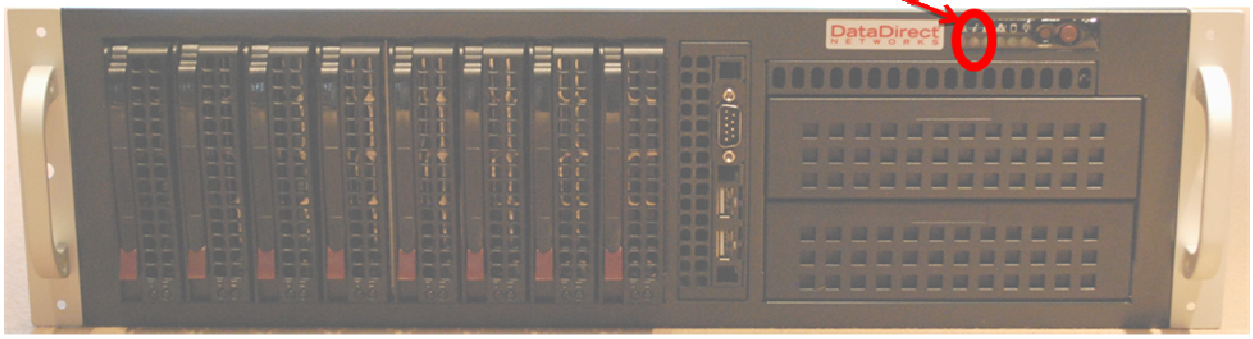
For SFA 12K-40 models, the bezel must be removed in order to view the Identify LED (Enclosure information LED) on the controller. The bezel can be removed by gently pulling it away from the controller – it is attached by snap-in pins which do not require tools to remove or install.

SFA 12K-40 BEZEL

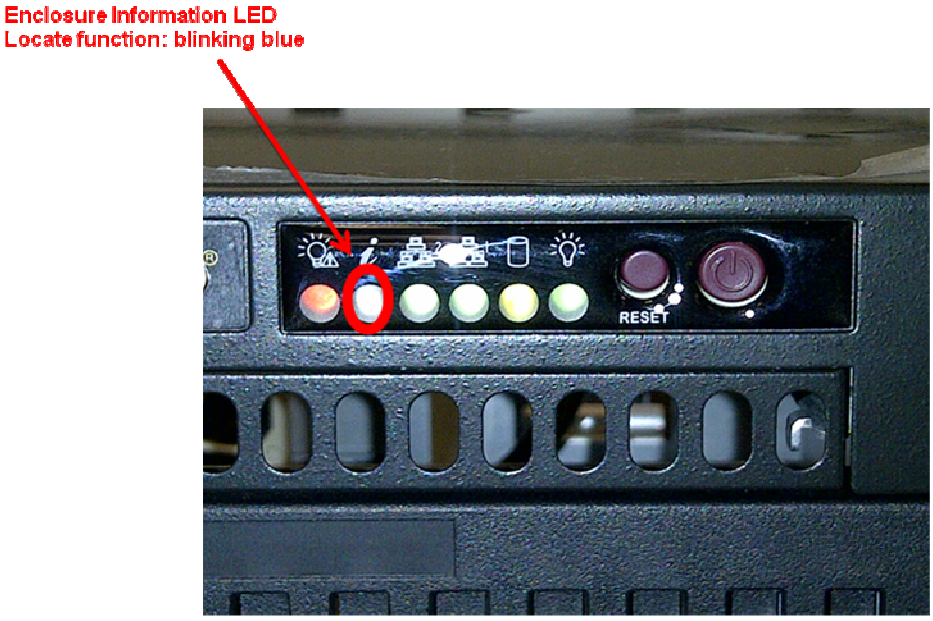
SFA 12K-40 Front Panel

Bezel Removed

Enclosure Information LED
Locate function: blinking BLUE



SFA 12K-40 Enclosure Information LED Detail



Step 3: Create an event log entry to record the controller replacement service action

A best-practice optional step is to record a log entry in the healthy controller's log to note the service action undertaken. Log into the healthy controller and use the mark command to create a user event log entry similar to the example below:

```
mark subsystem local text "Controller replacement service action initiated"
```

Change the text in above example as required. Refer to the SFA product CLUI user guide’s instructions "mark" command section for more information on creating event log markers.

Step 4: Capturing SFA Subsystem Configuring Information prior to the service action

If the controller targeted for replacement is in an operational state to accept CLUI commands, it is best practice to capture and save the output of the following commands in order to obtained detailed configuration information on the SFA 10000 subsystem prior to the service action.

```
show subsystem summary
show subsystem summary all
app show host
app show presentation
app show initiator
app show discovered_initiator
ui show net local 0
ui show email
ui show snmp
```

Step 5: Repeat the same steps on the healthy peer controller

Note: If only one controller is responsive, collect the status from only the healthy controller.

Step 6: Shut down the controller to be replaced

If the controller to be replaced is operational, it should be shut down gracefully prior to replacement. Log in to the controller and use the command "shutdown controller local". Refer to the shutdown command in the user guide.

Step 7: Verify controller shutdown

Verify that the controller has been shut down by checking the Power LED status of the controller and its dedicated Battery Backup Unit (UPS).

Step 8: Physically replace the controller

Disconnect the cables of the controller to be replaced. Remove it from the rack. Install the replacement controller and reconnect all cables. SFA 10000 and SFA 12K-40 cable connection diagrams are documented in their users guides.

Step 9: Configure the IP address of the replacement controller

After Controller replacement, the replacement controller will arrive with an initial factory IP address and must be configured.
Refer to the User guide on using a serial console to configure the IP address back to the desired value. It will also be necessary configure any SNMP and email parameters to match the previous settings.
FRU Field replacement SFA 10000 and SFA 12K-40 singlets will be configured by factory default with address 10.0.0.1 unless noted otherwise.

Default IP addresses for complete FRU couplets are 10.0.0.1 for controller 0 and 10.0.1.1 for controller. The corresponding factory default subnet mask is class C (255.255.255.0).

Step 10: Determine if a firmware update is required on the replacement controller

If the firmware level on the replacement controller is the same as the version installed in the subsystem, it will directly become operational after power on connectivity tests complete successfully. If the firmware on the replacement controller has a different firmware version installed, it will power up and boot into an offline MIR state: MIR_VERSION_MISMATCH. To clear the MIR state and bring the replacement controller online, a firmware update on the replacement controller will be required.

Step 11: If required, update the replacement controller to match currently installed version

If a firmware update is necessary, refer to the firmware update section of the user guide for instructions on updating the replacement controller.

Step 12: Power up replacement controller and verify that it becomes correctly operational

When matching firmware is installed on the replacement controller, it will attempt to join the SFA subsystem configuration and validate all cable connections.
If successful, all disks will be recognized by the replacement controller and it will become operational. Pools will be rebalanced and moved back to their preferred home RAID processors after a period of up to 10 minutes. It is recommended that a SFA support contact review the detailed configuration of the subsystem after controller replacement to validate all key aspects of the status.

END