DDN StorageScaler8460

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.

Replacement Overview

Here is an overview of all the steps for installing a SS8460 system.

1. Safety
2. Preparation
3. Power down of the system.
4. Disconnect the SS8460 from the Storage Controllers or Expansion Enclosures.
5. Removal of Suspect SS8460 Chassis from Current Configuration.
6. Installation of New Replacement SS8460.

Safety

NOTE : If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The SS8460 MUST be grounded before applying power. Unplug the unit if you think that it has become damaged in any way and before you move it.

CAUTION ! To maintain proper airflow through the system, operate the system with the enclosure top cover closed.

- Plug-in modules are part of the enclosure and must only be removed when a replacement can be immediately installed. Operation of the SS8460 with ANY modules missing will disrupt the airflow and the components will not receive sufficient cooling.
- In order to comply with applicable safety, emission, and thermal requirements, th top cover should remain closed while running.
- The SS8460 system must only be operated from a power supply input voltage range of 200VAC to 264VAC.

NOTE : On racked systems, the operational voltage range will be limited to 200-240V nominal to reduce the current within the power distribution system.

- The equipment is intended to operate with two (2) working power and cooling modules (PCM). Before removal/replacement of any module, disconnect all supply power for complete isolation.
- A faulty PCM must be replaced with a fully operational module within 24 hours.

To minimize the risk of electric shock, disconnect the power from the PCM, either by turning off the switch or by physically removing the power cable, prior to removing the PCM from the enclosure.

- Do not remove a faulty PCM unless you have a replacement module of the correct type ready for insertion.
- A safe electrical earth connection must be provided to the power cord.
- Provide a suitable power source with electrical overload protection to meet the requirements given in the product specifications.

- There are no user-replaceable parts inside the PCM. Do not attempt to repair a PCM. Disassemble of a PCM voids the warranty.

Due to the danger of electrical shock, do not remove covers from the PCM. Return the module to your supplier for repair.

Recycling of Waste Electrical and Electronic Equipment (WEEE)

At the end of the product's life, all scrap/ waste electrical and electronic equipment should be recycled in accordance with local/national regulations applicable to the handling of hazardous/toxic electrical and electronic waste materials.

NOTE : Observe all applicable safety precautions, such as weight restrictions, handling batteries, and lasers, detailed in the preceding paragraphs when dismantling and disposing of this equipment.

ESD Precautions

CAUTION ! Observe all conventional ESD precautions when handling the SS8460 plug-in modules and components. Avoid contact with backplane components and module connectors.

Data Security

- Each enclosure contains up to 84 removable disk drive modules. Disk units are fragile. Handle them with care, and keep them away from strong magnetic fields.
- Always allow new disks to acclimate to room temperature (for 1 to 2 hours) prior to installation.
- ***ALL*** the supplied plug-in modules and blank modules must be in place for the air to flow correctly around the enclosure and also to complete the internal circuitry.
- If the enclosure is used with modules or blanking plates missing for more than a few minutes, the enclosure can overheat, causing power failure and data loss. Such use may also invalidate the warranty.
- If you remove a disk module, replace it immediately. If it is faulty, replace it with a disk module of the same type and capacity.
- Ensure that all disk drives are removed from the enclosure before attempting to move the rack installation.
- Do not abandon your backup routines. No system is completely foolproof.

StorageScaler 8460 Replacement Instructions

1.0 Removal Preparation

1. 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

.

2. Remove Rack Door from hinges and set aside.

2.0.0 Single SS8460 Power Down Procedure

1. Stop all I/O to the SS8460.
2. Perform a “show subsystem summary” command and note any faults (not being corrected by the enclosure replacement), total physical disks, pool state, virtual disk state, and disk channel count.
3. Note either the failed enclosure’s ID or all the surviving enclosures ID’s with a show enclosure command.
4. Shutdown controllers with a “shutdown subsystem” command. This will power down the storage controllers.
5. Power down the SS8460 by turning off the switches on the PCMs. Figure 2

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2.0.1 Multiple SS8460 Power Down Procedure

1. Stop all I/O to the SS8460 enclosures.

2. Perform a “show subsystem summary” command and note any faults (not being corrected by the enclosure replacement), total physical disks, pool state, virtual disk state, and disk channel count.
3. Note either the failed enclosure’s ID or all the surviving enclosures ID’s with a “show enclosure” command.
4. Shutdown controllers with a “shutdown subsystem” command. This will power down the storage controllers.
5. Power down the master SS8460 by turning off the switches on the PCMs.
6. Power down the remaining expansion enclosures by turning off the switches on their PCMs. Figure 2

3.1 Disconnect the SS8460 from the storage controllers or expansion enclosures.

Each SS8460 ships with two fully redundant PCMs. **CAUTION:** If power cable replacement is required. Use only the power cables supplied with the enclosure. Do NOT use another type of cord or extension cords. If you require additional power cables, please contact your DDN sales representative.

1. Verify that the power switch on both PCMs is in the OFF position (Figure 2).
2. Then disconnect the two power cables from rear of the SS8460. (Figure 3).

Figure 2
A Power and Cooling Module (PCM)

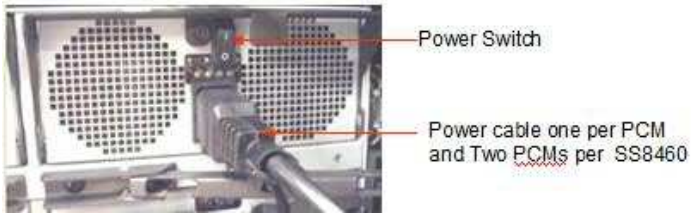
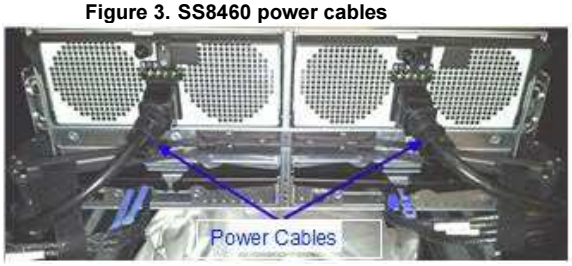


Figure 3. SS8460 power cables

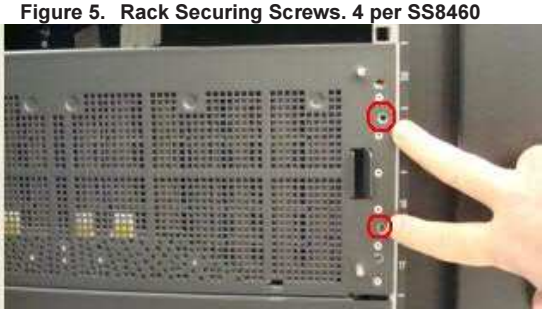


3. Remove the SS8460 font bezel by positioning your hands as shown on Figure 4 ON EACH SIDE of the bezel and gently pulling outward away from the rack front and towards yourself.

Figure 4. Font Bezel

4. Remove the four screws (2 per side) that secure the SS8460 to the rack front. Figure 5.

Figure 5. Rack Securing Screws. 4 per SS8460



5. Use step ladders supplied with the FRU enclosure for upper rack U locations as needed.

6. Verify that the cables and cable arm assemblies are such that cables won't get hung up and pulled on when the enclosure is removed.

7. Slide the enclosure out from the rack by pushing in the two release tabs on front of the enclosure (Figure 6). Keep pulling until the enclosure locks and you hear a clicking. The unit should now be out enough to open top covers.

Figure 6. Release Tab on Enclosure Front

8. Disconnect the SAS cables from the I/O modules. Disconnect the cable at the highest position in the Cable Management Assembly CMA from the innermost host port used on the I/O module (Figure 6). Then disconnect the second cable to the next innermost host port used, working from the inside toward the outside. Use Velcro to tie back in a safe place. Note that for SFA subsystem installation, not all host ports are used on the I/O modules. Refer to the cable maps given in the *SFA OS User Guide* to determine which host ports are used

Figure 6. Cable Positions in CMA

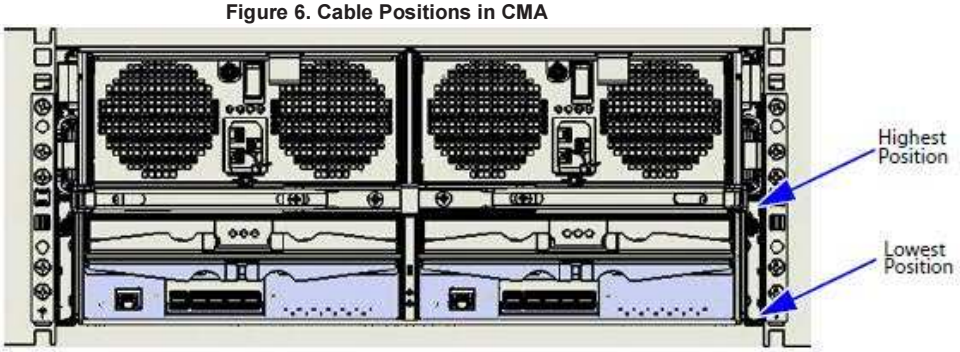
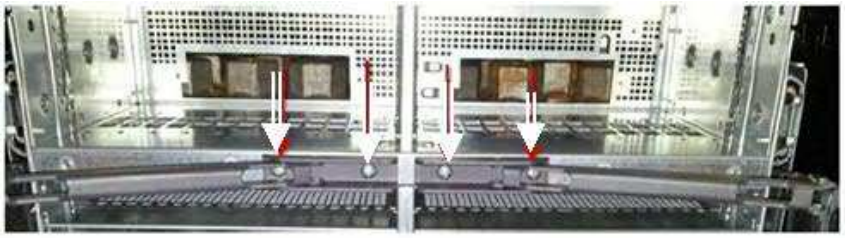


Figure 7 .CMA Cross Bar Removal



9. Remove the CMA cross bar on the rear panel of the enclosure by removing two #10-32 screws as shown in Figure 7.

10. Repeat Step 1 above to remove the other CMA cross bar from the rack rear panel of the enclosure.

4.0 Removal of Disk Modules and Enclosure

Observe all conventional ESD precautions when handling the disk modules, avoid contact with module connectors. Electrostatic discharge can damage the circuit boards.

CAUTION : Whenever handling disc modules ensure that the disk modules are at room temperature before installing ore removing and powering up the SS8460. It is recommended that the disks are allowed at least two hours at installation and thirty 30 minutes after power down to acclimate to room temperature. Figure 8 shows the layout of disks in the SS8460. The disk layout may also be found inside the cover of the enclosure. Refer to Appendix B for information on zoning configuration.

1. Prepare an area such as a table located in close proximity to the SS8460 you are working on for placement and temporary storage of the removed disc modules. **NOTE**: It is highly recommended that each disc module and blank be labeled with its current installed location within the SS8460 prior to removal.

2. Store the drives in an area so that they remain acclimated to room temperature. Drives and new replacement enclosure must be acclimated to the same room temperature before drives can be reinstalled into the replacement enclosure.

Figure 8 . Disk Module Layout

1	15	29	43	57	71
2	16	30	44	58	72
3	17	31	45	59	73
4	18	32	46	60	74
5	19	33	47	61	75
6	20	34	48	62	76
7	21	35	49	63	77
8	22	36	50	64	78
9	23	37	51	65	79
10	24	38	52	66	80
11	25	39	53	67	81
12	26	40	54	68	82
13	27	41	55	69	83
14	28	42	56	70	84

Front of Chassis

3. Swing up both cover release handles to disengage the locks (Figure 9). Lift up the cover. The cover is equipped with constant torque hinges which allow the door to remain in place at any open position and prevent it from being dropped.

Figure 9. Cover Release Handles

When removing the disk modules:

- Create a more balanced load by evenly distributing the disk modules among the enclosures
- Always remove the rows from back to front.

Note that disks with similar rotational speeds are placed in the same row if a mixture of disk technologies are populated into one enclosure, for optimal performance, the best loading order from back to front will be:

- SAS disks, SATA disks, then SSD
- - 3.5" HDD, then 2.5" HDD or smaller
-

Note : To ensure proper airflow through the enclosure, the SS8460 requires that any empty disk slot to be filled with a blank module.

4. On the disk module, press the latch to release the handle (Figure 10).

Figure 10. Release Latch on Disk Module

5. Carefully slide the module from the disk slot (Figure 11).

Figure 11. Removing Disk Modules

6. Repeat Steps 4 and 5 above to remove all the remaining disks and blank modules.

5.0 Removal of Suspect SS8460 Chassis from Current Configuration.

1. Carefully position the lift tool in front of the rack (Figure 12) 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 Figure 13

Figure 12. Proper Lift tool Place in Front of the Rack

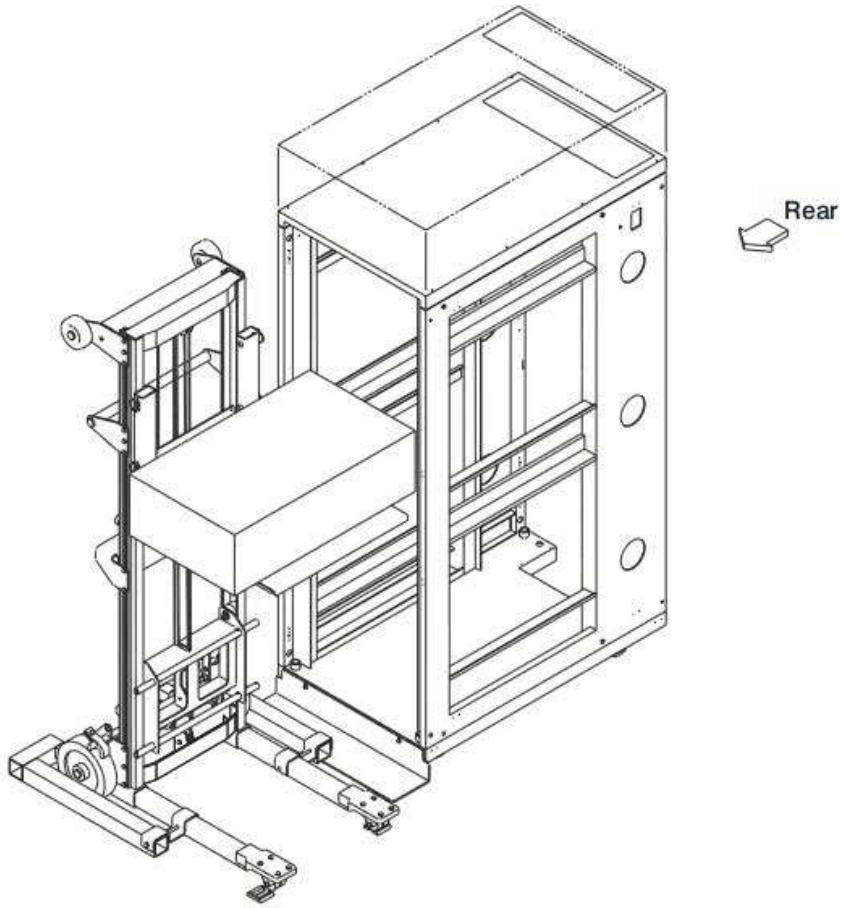


Figure 13 Foot break lock / unlock mechanism

2. Carefully disengage the enclosure rails from the rack rails and slide the rack rail back into the rack (Figure 14a and 14b). The SS8460 Enclosure is now dismounted from the rack. Adjust Load plate up and down as necessary for ease of enclosure removal.

Figure 14a Detach Enclosure Rail from Rack Rail (Right Side)

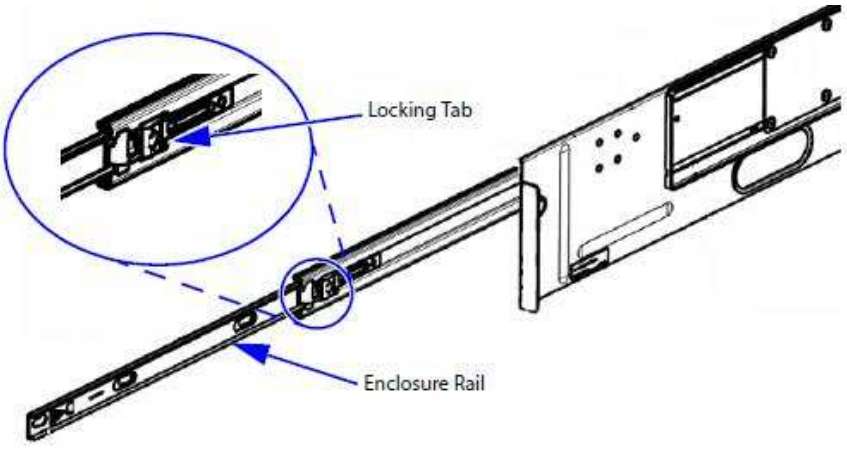
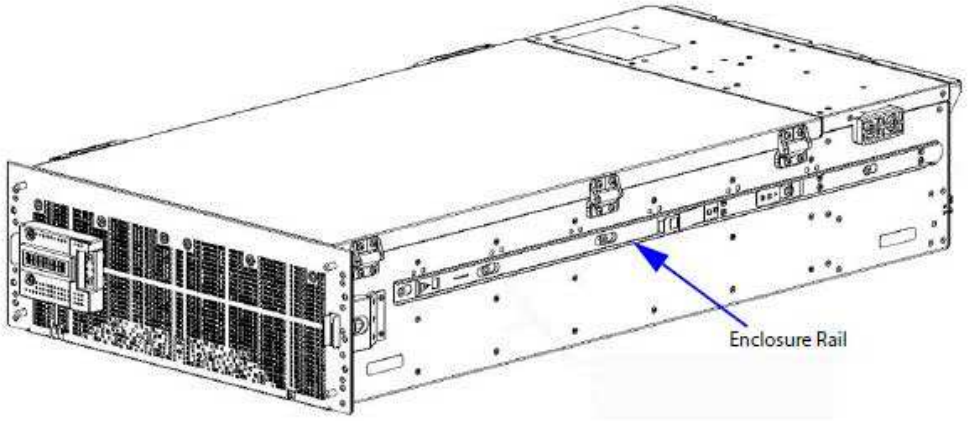


Figure 14b



3. Re Use the packaging material from the new replacement unit to repack the suspect unit for proper return.

6.0 Installation of New Replacement SS8460

6.01 Installation Overview

1. Unpack the SS8460 system.
2. Rack mount the SS8460 and install cable management assembly. Refer to Appendix A for physical dimensions and weight of the SS8460.
3. Install the disk modules.
4. Connect the SS8460 to the storage controllers or expansion enclosures.
5. Power up the system.

Observe all conventional ESD precautions when handling the SS8460 plug-in modules and components. Avoid contact with backplane components and module connectors. Electrostatic discharge can damage the circuit boards.

6.0.2 Unpacking the SS8460

Your SS8460 ships with the following:

- SS8460 enclosure
- Two power cables
- Rack-mounting hardware
- Cable management hardware
- SS8460 user documentation CD
- Disk modules
- Blank modules (if ordered)

Before you unpack your SS8460, inspect the shipping containers for damage. If you detect damage, report it to your carrier. Retain all boxes and packing materials in case you need to store or ship the system in the future.

The SS8460 enclosure is very heavy and requires assistance when lifting or installing the unit in a rack. A SS8460 can weigh up to 244 lbs (110.9 kg) with disks installed. (It is recommended that no disks are inserted prior to installing the enclosure in a rack.) A forklift or lift table is recommended when unpacking and installing the SS8460 to prevent possible injury.

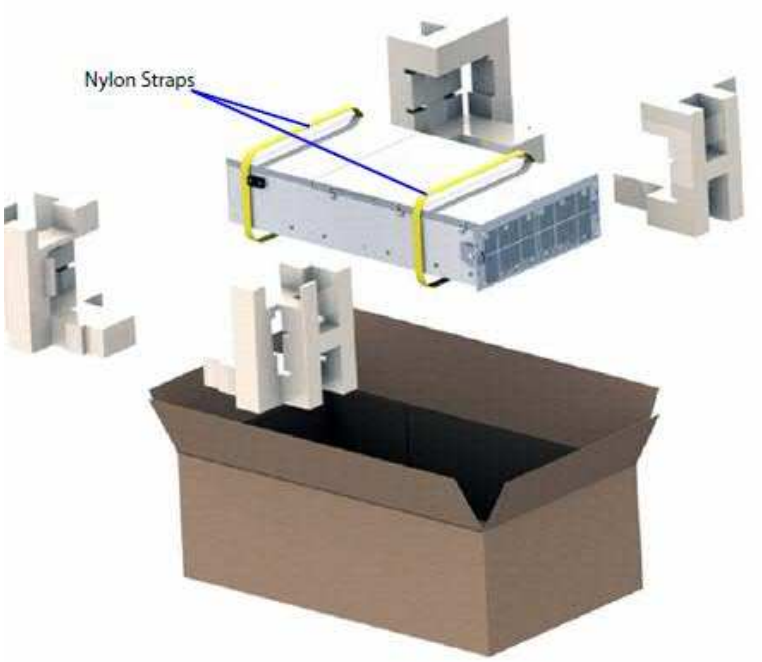
Perform the following steps:

1. Open the top of the box. Inspect for damage.
2. Remove all the components from the packaging, inspect the SS8460 chassis and all components for signs of damage. If you detect any problems, contact DataDirect Networks Customer Service as soon as

possible. Then place the components on an anti-static surface until you are ready to use them.

3. There are two nylon lifting straps that are used to remove the enclosure assembly from the box (Figure 15). A forklift or other mechanical lifting device is highly recommended to remove the unit and to place on the IBM lift tool.

Figure 15 Unpacking the SS8460



6. If you are installing the enclosure in a rack: a) Ensure that you have these tools available: • Phillips screwdriver • Bubble level b) Arrange for assistance during installation c) Ensure ahead of time that you have chosen a suitable location for the enclosure or rack assembly.
7. Ensure that the area around the enclosure or rack assembly has sufficient cooling and space around the unit to access cabling.
8. When installing disk modules, allow them to acclimate to room temperature prior to installation. Disks should be stored at room temperature for at least two hours prior to use.

6.0.3 Installing the SS8460 in a Rack

The SS8460 enclosure is designed to fit within a 4U rack space. Follow these steps to mount the enclosure in your rack:

1. Ensure that you have these rack mount components: • Rack rails (one left, one right) • Rail installation hardware (screws, screw plates, shelf locking brackets)

2. Remove the enclosure rails from the right and left side of the enclosure. If rails were shipped with the replacement unit you may instead, pull the enclosure rail out of the rack rail until it is fully extended. Then press the locking tab down to release the enclosure rail (Figure 15a and B). Press the locking tab on the middle rail and push it back into the rack rail. Repeat for the other rack rail.

Figure 15a Detach Enclosure Rail from The Right and Left Sides (Right Side shown) or remove from suspect unit. SS8460 Rail (Right Side)

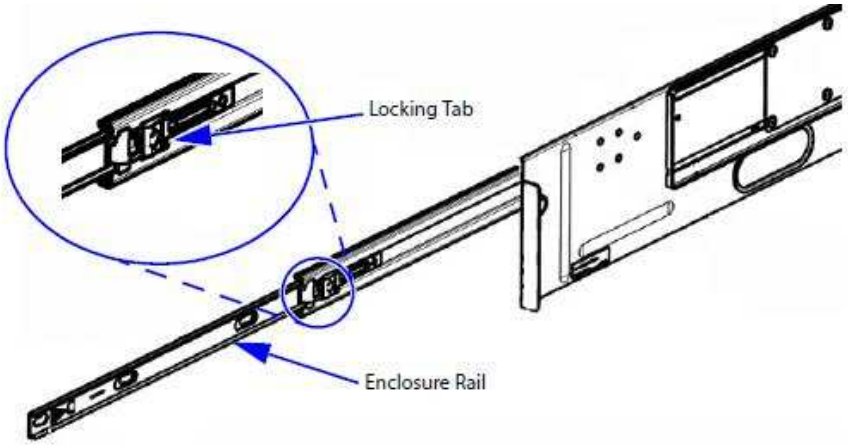
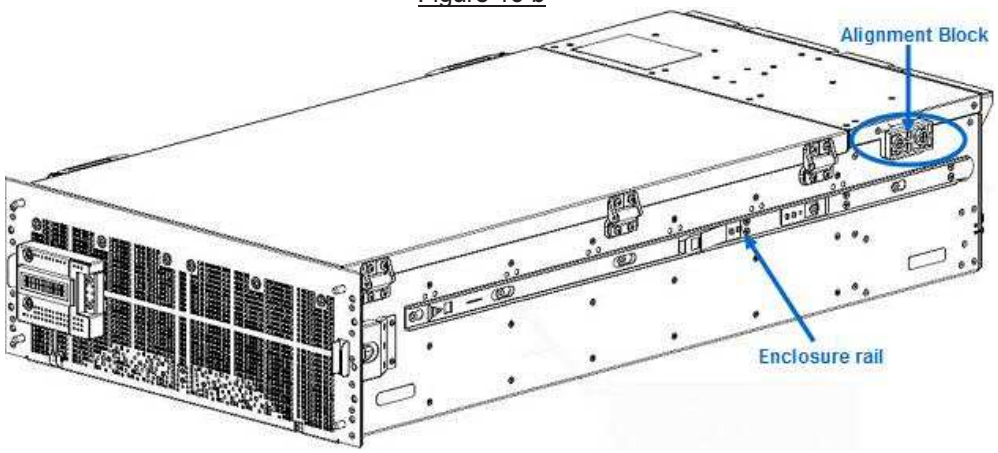
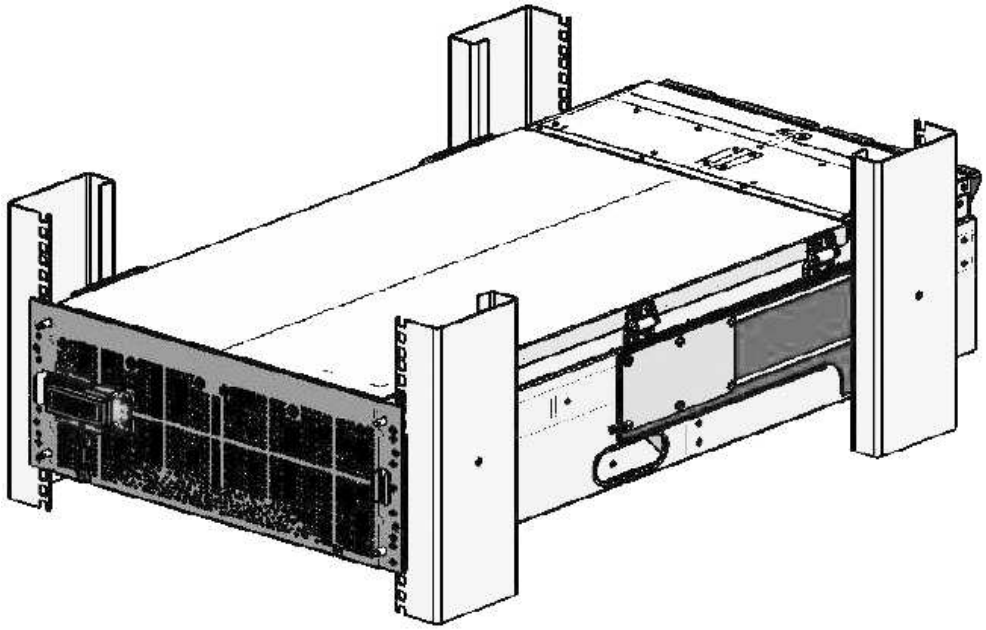


Figure 15 b



3. Attach the enclosure rails to each side of chassis by positioning the rails over the keyhole tabs, and slide the rails into place. The rails are marked “R” (right) and “L” (left) viewing from the front of the enclosure. Do not exchange the enclosure rails. Secure each rail using seven #8-32 flat head screws (Figure 15b).
4. With the new replacement SS8460 in place on the lift tool carefully position the lift tool in front of the rack (Figure 12) 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 Figure 13.
5. Position the lift tool shelf and new replacement SS846 to the proper height to enable alignment of enclosure rails and rack rails and slide the rear alignment blocks on to the rack rails to align the enclosure properly with the rack rails.
6. Carefully engage the enclosure rails into the rack rails and slide the enclosure in until the enclosure rail tabs “click” into place. The SS8460 enclosure is now mounted in the rack (Figure 16).

Figure 16. Enclosure installed in Rack



7. Carefully reinstall all drives removed in previous steps by sliding the module into a disk slot until it contacts the baseboard and begins to engage the handle (Figure 11). Press down on the handle until it latches which will cam the module into place.
8. Reconnect the SAS cables, CMA cross bars.
9. Verify that the power switch on both PCMs is in the OFF position Figure 2.

10. Reinstall Power cables removed in previous steps. Figure 3.

6.0.4 Single SS8460 Power up Procedure

1. Turn the switch on each PCM to the ON position.
2. Wait approximately 1 minute for all the disks to become ready.
3. Power on and boot the storage controllers.
4. Verify and set zoning if necessary
    a. Note lines 11 and 12 from the output of “show enclosure X all” where X is index of the replacement enclosure
    b. For 1-5 shelf configurations, the zoning should be:
        i. Zones: 2
        ii. Zoning Configuration: 1
    c. For ten or greater shelf configurations the zoning should be:
        i. Zones: 1
        ii. Zoning Configuration: 0
    d. If the enclosure zoning is incorrect (normally set by the factory with one zone) then issues the following commands against the enclosure:
        i. “Set enclosure X zoning Y” (where X is enclosure index and Y is 0 or 1)
        ii. “Set enclosure X restart” (see index from previous step)
        iii. Issue “show enclosure + 60”. Wait until response is TRUE, and then hit return to stop the output.
        iv. Show enclosure X all (verify zoning change took affect)
5. Perform a show subsystem summary command and note any faults (not being corrected by the enclosure replacement), total physical disks, pool state, virtual disk state, and disk channel count.

6.0.5 Multiple SS8460 Power up Procedure

CAUTION : The power up order is critical for each of the expansion enclosures to properly be seen by the previous unit in the chain. For systems with expansion enclosures attached, the enclosure last in the chain should be powered up first, followed by the other enclosures with the master unit being turned on last.

1. Turn the switch on each PCM supply to the ON position.
2. Wait approximately 1 minute for all the disks to become ready.
3. Power on and boot the storage controllers.
4. Verify and set zoning if necessary
    a. Note lines 11 and 12 from the output of “show enclosure X all” where X is index of the replacement enclosure
    b. For 1-5 shelf configurations the zoning should be:
        i. Zones: 2
        ii. Zoning Configuration: 1
    c. For ten or greater shelf configurations the zoning should be:
        i. Zones: 1
        ii. Zoning Configuration: 0

d. If the enclosure zoning is incorrect (normally set by the factory with one zone) then issue the following commands against the enclosure:
    i. “Set enclosure X zoning Y” (where X is enclosure index and Y is 0 or 1)
    ii. “Set enclosure X restart” (see index from previous step)
    iii. Issue “show enclosure + 60”. Wait until response is TRUE, and then hit return to stop the output.
    iv. Show enclosure X all (verify zoning change took affect)

5. Perform a “show subsystem summary” command and note any faults (not being corrected by the enclosure replacement), total physical disks, pool state, virtual disk state, and disk channel count.

6.0.6 Repack Suspect SS8460 and IBM Lift tools

1. **Repack the suspect SS8460 in the box that the new replacement came in for safe FRU return shipment by performing the unpack steps in reverse order.**
2. **Repack IBM Lift tools for return to Tools Depot by following the instructions provided with the tool.**

For complete Support Instructions Refer to DDN StorageScaler 8460 User Users Guide. This and all All Intelligent Clusters related Documentation can be found at.

http://www-947.ibm.com/support/entry/portal/documentation

In the Quick find field input Intelligent Cluster.
Under Production Documentation Select the Appropriate release level (e.g. 13A).

END OF INSTRUCTIONS.

Appendix A
Product Specifications

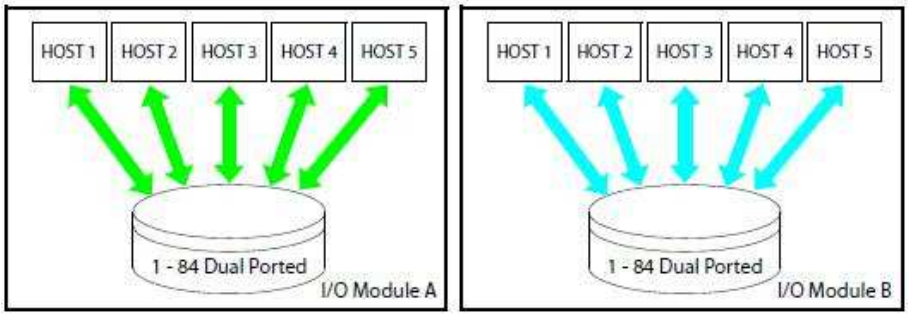
Host interface	miniSAS HD	
Disk interface	SAS / SATA /SSD 3 Gb/s and 6 GB/s Up to 84 disks per enclosure	
Redundant components	Power and cooling module I/O module 5V regulator	
Field Replaceable Units (FRUs) (also hot-swappable)	Power and cooling module I/O module 5V regulator Disk module LCD module	
Chassis dimensions (comply with the EIA-310-D standard for rack-mountable equipment)	Height:	6.97" (177 mm)
	Width:	19" (482.6 mm)
	Depth:	34" (863.6 mm) without bezel and cable management assembly; 40" (1016 mm with bezel and cable management assembly
Chassis weight	76 lbs (34.5 kg) without disks 244 lbs (110.9 kg) with disks	

Appendix B
Zoning

Zoning Configuration o

Zoning configuration 0 is the single zone configuration. In this configuration, all installed disks are presented to all the host ports on both I/O modules (Figure 16).

Figure 16. Zoning Configuration 0 Disk Presentation



Zoning Configuration 1

When zoning configuration 1 is active, the devices are divided into two groups of 42 disks as shown in Figure 17.

Figure 17. Zoning Configuration 1 Drive Groups

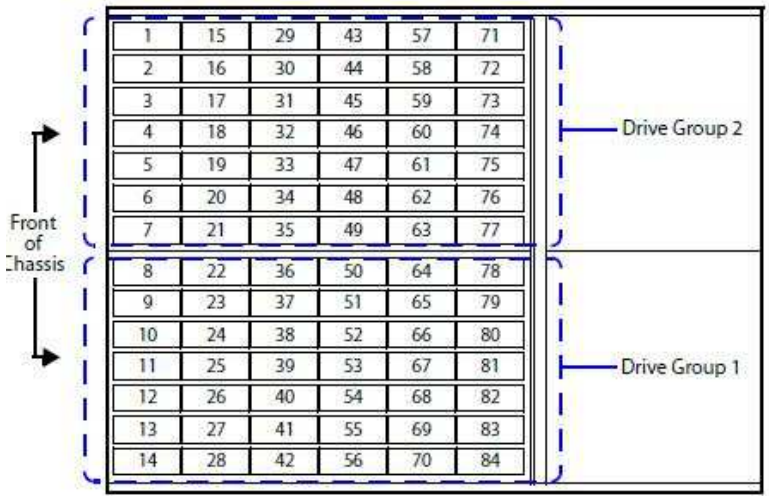
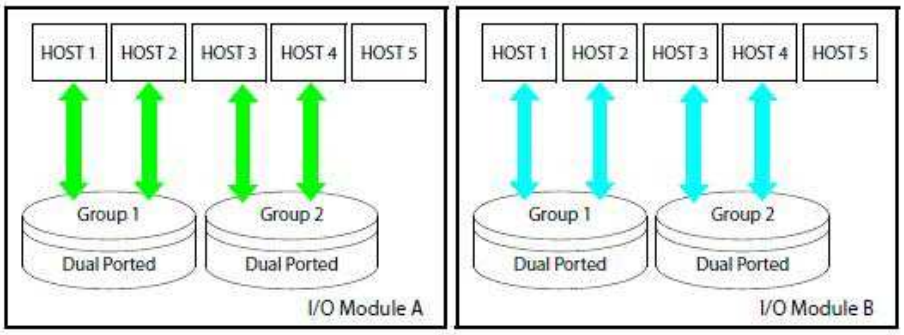


Figure 18. Zoning Configuration 1 Disk Presentation



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