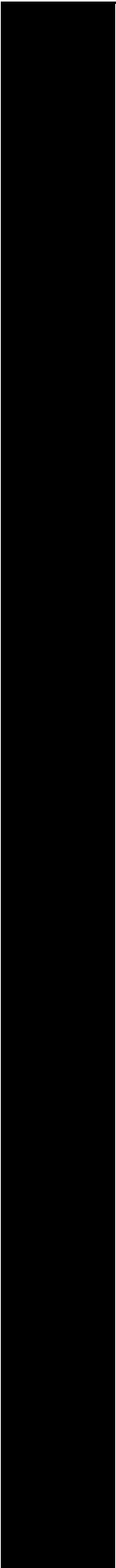


Client Server Disk CBNT M03 Rackmount Cabinet

User's Guide





Client Server Disk CBNT M03 Rackmount Cabinet

User's Guide

Information contained in this publication is subject to change. In the event of changes, the publication will be revised. Comments concerning its contents should be directed to:

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Summary of Changes

The following is the history and summary of changes for this publication.

Date	Edition	Description
December 1999	First	Initial Release
June 2000	Second	Updated manual to reference a cabinet supplement; added new feature instructions involving the stabilizing feature (earthquake securing hardware), and information on design enhancements involving cooling and AC power ports to chapter three.
September 2000	Third	Product nomenclature and formatting changes

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Preface

This manual presents StorageTek's new M03 rackmount cabinet for its Client Server Disk storage subsystems and network devices. This document enables customers and StorageTek support personnel to install, maintain, repair, and upgrade the rackmount cabinet for the customer's growing storage and processing needs—ensuring an open, intelligent, and integrated solution for the customer and the customer's customer.

This user's guide contains information to help the above mentioned processes. The purpose of this document is to provide information so that our customer support personnel can handle any issue surrounding the M03 cabinet, and ensure ongoing customer satisfaction with StorageTek solutions.

The information in this guide is intended for StorageTek territory and account executives, account team, and service representatives involved with cabinet installation, maintenance, and conversions. This guide is designed to provide information on what you can and cannot do.

Note: More information can be found on the Client Server Disk web page at:
<http://gandalf.storitek.com/ctp/>

■ Organization

This book contains the following information:

Front Matter “Preface” contains information about the organization of this document as well as cabinet safety instructions.

Chapter 1 “Installing the Cabinet” introduces the reader to the cabinet and its parts, and then describes the process for installing the cabinet.

Chapter 2 “Maintenance and Repair” contains information about the PDU and explains how to replace this FRU if a problem does occur.

Chapter 3 “Upgrading the Cabinet” tells how to modify the internal rackmount configuration of the cabinet, and how to add special cabinet features for stabilizing and securing the cabinet.

Reader's Comment Form This form provides a mechanism for customer support personnel to feedback their needs so that we may improve the information that we provide.

■ Alert Messages

Alert messages signal the reader to special information pertaining to a concept, a procedure, or other information.

Note: Provides additional information that might be of special interest. A note can point out exceptions to rules or procedures. A note usually, but not always, follows the information to which it relates.

CAUTION:

Inform the user of conditions that might result in damage to hardware, corruption of customer data or application software, or long-term health hazard to people. A caution always precedes the information to which it relates.

WARNING:

Alerts the user to conditions that might result in injury or death. A warning always precedes the information to which it pertains.

■ Trademarks

StorageTek is a trademark of Storage Technology Corporation. Other features or terms mentioned in this publication may be trademarks of Storage Technology Corporation or of other corporations.

■ Related Publications

Additional information is contained in the following publications and StorageTek solutions that use the M03 cabinet.

Publication	Part Number
<i>StorageTek 916X Systems Assurance Guide</i>	MC 5000
<i>StorageTek 9175 Disk Array Site Preparation and Planning Guide</i>	MN 5001
<i>StorageTek 9176 SAN Disk Array Site Preparation Guide</i>	MN 5002
<i>Client Server Disk Device Installation and Mounting Supplement</i>	95972

Note: Refer to StorageTek's product document CD, or go to <http://gandalf.storitek.com/ctp/> for specific solutions, part numbers, document descriptions, or to download information.

Notices

■ FCC Compliance Statement

The following is the compliance statement from the Federal Communications Commission:

Note: Each appliance installed by the factory has been tested and found to comply to the limits for Class A digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Some of the cables used to connect peripherals must be shielded and grounded as described in the installation manual. Operation of this equipment with the required cables that are not shielded and correctly grounded may result in interference to radio and TV reception.

Changes or modifications not expressly approved by StorageTek could void the user's authority to operate the equipment.

■ Japanese Compliance Statement

The following is the compliance statement from Japan:

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

Note: Each appliance installed by the factory is in the Class A category information technology equipment based on the rules of Voluntary Control Council For Interference by Information Technology Equipment (VCCI). When used in a residential area, radio interference may be caused. In this case, user may be required to take appropriate corrective actions.

Consequently, when used in residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc. Read the instructions for correct handling.

■ Taiwan Warning Label Statement

The following warning label statement from Taiwan, R.O.C. applies to each appliance installed by the factory.

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

Conventions

■ Fastening Hardware

Hardware uses standard naming conventions, which provide the diameter, pitch, and length. For example, a bolt that states 1/2-13 X 1 means that it has a diameter of 1/2 inch, 13 threads per inch, and is one inch long. A 10-32 Torx fastener, used in the CBNT M03, states a diameter of 10 and a pitch of 32.

Note: A Torx screw may be referred to as a bolt when a fastening nut is used.

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Installing the Cabinet

1

This chapter describes the rackmount cabinet (CBNT M03) used to house StorageTek's Disk Arrays and other Client Server Disk storage subsystems. The design objective of StorageTek's patented cabinet is to enable our customers to have a fixed 39U cabinet that will accommodate a variety of devices to support the customer's growing storage needs—maximizing storage and processing capability within one cabinet footprint.

■ Introduction

Storage systems may reside in a pedestal, deskside, or in three different rackmount-styled cabinets, as follows.

- CBNT M01 is a modular cabinet with a dual grid 20 amp PDU
- CBNT M02 is a modular cabinet with a dual grid 30 amp PDU
- CBNT M03 is a fixed 39U cabinet with two vertically mounted 30 amp PDUs.

This user's guide focuses on the M03 Rackmount Cabinet, however, some similarities will be mentioned between cabinets throughout this guide to help customer support personnel with installation, maintenance, and upgrade issues.

Cabinet Description

Rackmount-styled cabinets (CBNT M01, 2, or 3) are used by many of StorageTek's Client Server Disk storage subsystems. In the 916X product line, the M03 can contain one (or more) Disk Processor Enclosure (DPE) and from one to nine additional Disk Array Enclosures. In the 9175 product line, the M03 can contain up to eight 9175 Disk Trays. In the 9176 product line, there may be one (or more) 9176 Disk Controller (with one or two Storage Processors) and from one to ten additional 9170 Disk Arrays.

Also a variety of devices, such as servers, hubs, bridges, and a tape library can be installed to facilitate additional performance, connectivity, and capacity. All of the above-mentioned storage systems and these network enhancements provide the M03 cabinet with SAN-ready storage solutions for our customers.

Consult your StorageTek sales account team, to ensure you configure your subsystem for optimal performance.

Features and Benefits

The customer may mount multiple drawers of the same, or combinations of, storage system models in one cabinet. The M03 fixed cabinet is a height of 39U (68.25 inches of internal space). Externally the M03 is 75 inches in height.

Cabinet Parts

The fixed cabinet parts (components) are:

- Cabinet chassis
- Front and rear covers (as needed)
- Two 30 amp Power Distribution Units (PDU)
- Various numbers of rails depending on devices installed

The following illustrations show the M03 cabinet, with the front door option, which may be locked for added security of the customer's hardware and data.

Figure 1-1. CBNT M03



Physical Specifications

The M03 Cabinet design is described below based on E!A-STD-310-C, which describes usable cabinet space in terms of vertical modular units called a U.

Note: One U equals 44.45 mm or 1.75 inches.

Figure 1-2. Physical Specifications

Footprint: 600 MM (23.6 IN) Width X 876 MM (34.5 IN) Depth without door
600 MM (23.6 IN) Width X 966 MM (38.0 IN) Depth with door

Base Height: 120 MM (4.7 IN)

Top Member Height: 50 MM (2.0 IN)

Overall Cabinet Height = 1903 MM (74.92 inches)

39U of vertical interior space, and extra depth added to accommodate unique rackmount devices.

Mounting Rail Depth: 697 MM (27.44 IN)

Approximate Frame (with two PDUs) Weight = 113.4 kg (250 LBS) without a door and 127.0 kg (280 LBS) with a door.

Power Distribution Unit (PDU): Integrated, two per cabinet

Line Cord* for each 30 amp PDU:

VOLTS: 200-240 FREQ 50-60HZ
AMPS: 24 MAX PHASE 1
12 OUTLETS (IEC 320 C) MAX. 20 AMP CIRCUIT BREAKERS
PROTECT 6 OUTLETS EACH (RATED AT 16 AMPS MAX.).

*Line Cords: North American; Nema L6-30P Twist and Lock Plug
International; Connector Ready

The weight of the CBNT M03 with Client Server Disk devices installed ranges from approximately 213 kg (470 lbs.) with one controller and 10 drives to 545 kg (1200 lbs.) with one controller and 100 drives.

Note: Configurations with 2 controllers, 60 drives, and various network devices (or similar configuration) should calculate total cabinet weight at the high end.

WARNING:

If you are going to reconfigure the hardware devices in your cabinet, always remove them from the top first.

Removal of devices should always involve at least two persons.

■ Installing the Cabinet

Rack Safety Instructions

CAUTION:

Make sure to prevent an unbalanced condition that could cause the cabinet to become unstable and tip over. Always install heaviest devices at the bottom of the cabinet, and graduate to the lightest unit on top.

Always follow the manufacturer's guidelines for positioning, supporting, fastening an appliance in the cabinet.

Make sure that the installation of additional appliances has the same front to back (or back to front) air flow to maintain proper cooling.

Make sure that the ambient temperature inside the cabinet does not exceed 32° C (90° F).

Make sure that all equipment installed in the cabinet does not cause an overcurrent condition. Each PDU is designed to safely handle a maximum of 24 amps. Exceeding this maximum is NOT recommended, and is a violation of UL regulations.

Ensure that all appliances in the cabinet have a reliable earth-ground connection whether connected to a branch circuit or directly to the PDU.

Installation Considerations

The following should be taken into account concerning your M03 cabinet.

- Storage systems may be mixed in the M03 cabinets.
- Kits provide mounting hardware for the CBNT M03 cabinet (assuming an M03R mounting option is ordered).
- The cabinet is connected to the AC power source with a twist and lock power cord (NEMA L6-30P) on all North American installations, or by an International (connector-ready) power cord for all other areas of the world.

Note: A feature code selection for the M03 cabinet power cord should be placed with every order. Note: a connector-end that adheres to your standards must be obtained for all connector-ready orders.


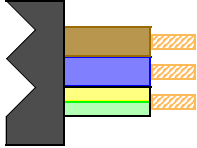
- The CBNT M03's AC power is distributed through a vertically-mounted 30 amp power distribution unit (PDU). Two PDUs are used to provide redundant AC power to the installed devices.

Note: The power source for the CBNT M03 cabinet is obtained via a power cord using a Nema connector on all North American installations. All International M03 installations require the customer (or local StorageTek office) to provide the power connector. The M03 power cord will only extend to approx. 2.4 meters (8 feet).

Table 1-1 lists the feature codes and part numbers for the CBNT M03 power cords.

Note: Although these power cords are approximately 3 meters (10 feet) long, only 2.4 meters (8 feet) of useful connecting distance is present.

Table 1-1. CNBT M03 Power Cords

Feature	Description	Attach-end View
9955	North American standard three-prong 250 VAC (NEMA L6-30P)	
9954	International (connector ready) type Note: Three ready-to-be-attached stranded-copper wires are available to connect via qualified personnel.	

Note: The customer's power receptacle for the M03 cabinet must be easily accessible. Additionally, the M03 cabinet (with two 30 amp PDUs) must have two separate customer-supplied circuits with overcurrent and short-circuit protection at 30 amps to provide full power redundancy.

Place the Cabinet

Some of the following are generic Client Server Disk - SAN Disk Array installation instructions given to provide an overview of the process. Refer to your product documentation for specific instructions.

- Unpack the cabinet, and carefully push the cabinet into its final location.

Note: The distance between the back of the cabinet and the customer's power source connectors should be 2.4 meters (8 feet) or less.

2. Make sure that the following service clearances are available.

- Front access: 915 mm (36 inches)
- Back (rear) access: 762 mm (30 inches)

3. Install the wire wheel chocks to help secure the cabinet in place.

Note: At this point you are now ready to connect to the host, which may require you to install HBAs and drivers per specific instructions.

4. Make sure the customer's power source is turned off, and then connect the M03 cabinet power cords to the customer's supplied connector(s). Separate power source circuits are recommended to maximize redundancy.
5. Secure/position power cords so that they are safe from damage.
6. Power up the M03 cabinet PDU breakers and outlet breakers (make sure they are in the ON position).
7. Now enable power to internal devices, as needed, and ensure that these devices have power.

Note: You should now be ready to connect Fibre Channel cables from the host (or network devices) to the storage subsystem, and set host, enclosure, or disk tray IDs to their desired setting. Make sure interface cables from the internal devices are routed down through the exit port at the rear of the cabinet.

Complete the Installation

At this point you are ready to reboot the host so the system will recognize the new storage subsystem, but before you do make sure that you:

8. Secure cables and replace any cabinet covers and floor tiles not yet replaced.

You can now reboot, and then install and run your subsystem storage managing software, configure your storage devices, or change the preset configuration to provide the performance and capacity that best meets the customer and the customer's customer needs.

Note: Always refer to the documentation for your specific storage solution before activating your StorageTek Disk Array, Client Server Disk Subsystem, or running any software verification program. This will help ensure that your storage subsystem is ready to be turned over to the host.

There is also a supplement to this manual called the Client Server Disk Device Installation and Mounting, P/N 95972. It is available for download at

<http://gandalf.stortek.com/ctp/9175/index.html>
or at <http://gandalf/ctp/9176/index.html>

Maintenance and Repair

2

This chapter contains information to enable quick and efficient service of the M03 rackmount cabinet.

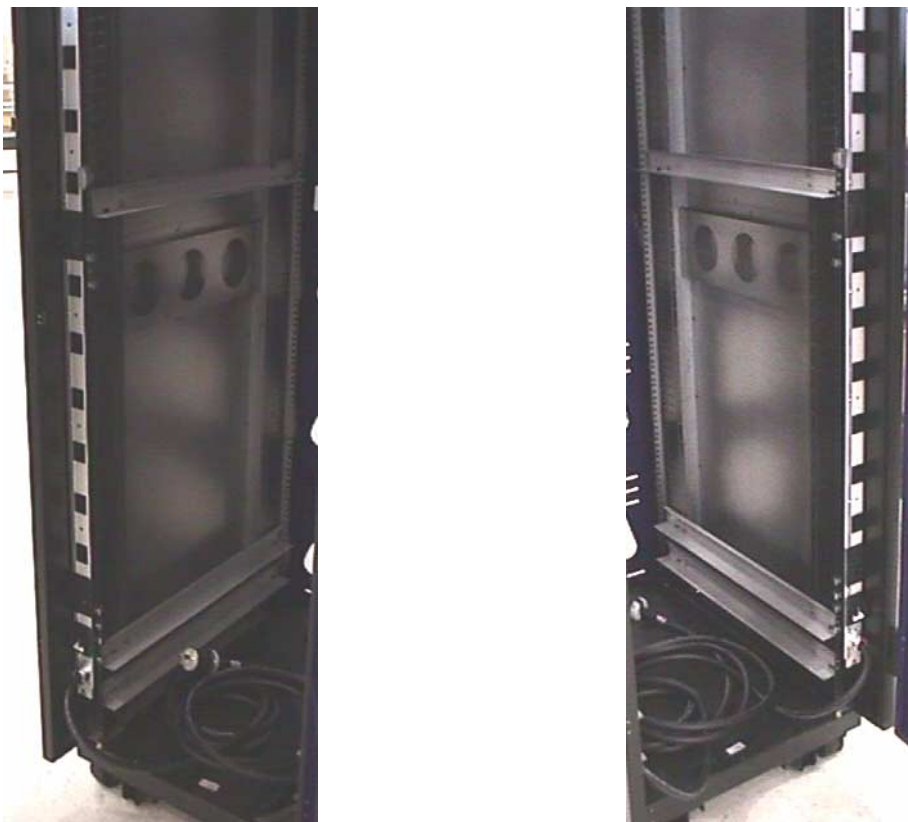
■ M03 Components and FRUs

As previously mentioned, the 39 U Fixed cabinet parts (components) are:

- Cabinet chassis (base, frame, and top member)
- Front and rear covers (as needed)
- Two 30 amp Power Distribution Units (PDU)
- Various numbers of rails depending on devices installed

The only FRU we discuss in this chapter is the 30 amp PDU, shown below.

Figure 2-1. Left and Right Side Power Distribution Units (Rear View)



PDU Troubleshooting

The only PDU component with moving parts are the circuit breakers, therefore, this is the most likely fault area. We must, however, investigate the root cause of the malfunction to avoid damaging the replacement PDU.

To better understand why circuit breakers trip, let us look at the design and purpose of a circuit breaker. The circuit breakers are designed to disconnect current flow whenever the load calls for more current than the power supply can safely deliver. If a circuit breaker does trip, it most likely indicates that too much current is being called for by one of the DC power supplies that are attached to that PDU. Another possibility is that you have exceeded the safe current-handling capability of the PDU (refer to [“Physical Specifications” in Chapter 1, “Installing the Cabinet”](#)).

If a circuit breaker keeps tripping, it is best to ask the customer for maintenance time and unplug any suspicious DC power supplies, or unplug all the AC power cords attached to that section of the PDU, and see if the circuit breaker remains on. If so, reapply power to the DC power supplies to identify which one is causing the over-current situation.

Note: In some cases an over-current situation can cause a circuit breaker to malfunction (trips all the time or below its current rating). In this case, a new PDU must be installed (along with whatever device caused the over-current situation in the first place).

If, however, this problem occurs with a new installation or upgrade and you believe that your current exceeds the 24 amp rating, review your system's power requirements (go back and recalculate the current that each device pulls) to ensure that your PDU is not overstressed. Refer also to [“AC Power Considerations for the CBNT M03” in Chapter 3, “Upgrading the Cabinet.”](#)

PDU Replacement

1. Obtain maintenance time from the customer.
2. Power down the entire subsystem and disconnect the power cord from the customer-supplied power source.
3. Unplug (noting the location) all the attached AC power cords.
4. Remove 4 Torx screws that fasten the PDU to the cabinet.
5. Fasten the new PDU, and reconnect all 120v AC power cords.
6. Connect the PDU power cord to the customer-supplied power connector.
7. Power up and return the subsystem to a functional state.

Upgrading the Cabinet

3

This chapter contains information to enable customer support personnel to upgrade the M03 cabinet, thereby increasing storage capacity (shelves) for hubs, servers, bridges, switches, or any networking need that surfaces. Also in this chapter are instructions for adding earthquake securing hardware, as well as modifying the cabinet for alternate AC power inputs.

■ M03 Components

This chapter discusses the various parts needed to configure your cabinet for additional components or various situations. Field and conversion bills (depending on your customer's growing or changing storage and networking needs) will provide parts and additional instructions, as needed. This chapter assumes that you may be doing a drastic change to your cabinet, and therefore is organized assuming a complete strip-down and rebuild.

Introduction

Mounting rails are the basic building blocks, enabling you to use the vertical space in your cabinet. A cabinet's mounting rail is shown below.



Mounting Rail (left side—front view)

1. 10-32 Torx screw in lower hole position and into a clip-nut on the front vertical rail (with rectangular slots)
2. 10-32 Torx screw in upper hole position and into a clip-nut on the back vertical rail

Note: The left and right mounting rails are identical. They line up with alternating chassis holes based on the U height you need for each additional device.

The mounting rails stack up to provide use of vertical space—allowing various U-sized components to be added to your CBNT M03. Clip nuts and staggered holes enable adjustments to specific U sizes (one U equals 1.75" vertical interior space), and to add storage and network devices to the full 39 U internal height.

Refer to the *Device Installation and Mounting Supplement* (P/N 95972) for more information on the proper U stack-up process.

Note: A special mounting tray may be used to support units that are not designed as 19-inch (front panel width) rackmount units.

In a complete rebuild, the first thing that will have to be done is the removal of the present devices and mounting rails. In this event, always refer to specific instructions concerning your specific solution, remembering to follow all safety and ESD precautions to avoid harm to yourself or to the equipment.

M03 Cabinet Modifications

The following steps provide the basic procedure for removing devices, adding outrigger legs or special slider trays, which may be required to be installed per a conversion bill; and reinstalling devices. Also included are instructions for fitting your cabinet with earthquake securing hardware, as well as modifying your cabinet for alternate AC power inputs.

WARNING:

Make sure that all customer data has been backed up, and that devices and cables that will be removed and added to this cabinet are identified in such a way as to ensure that they go back in the same order that they were originally in (so the host and controllers will communicate to the same devices as before).

Remove Blank Panels and adjust mounting rails

A standard tool kit (with a T25 Torx driver) is needed for most modifications.

Instructions:

Note: Always install heavier units toward the bottom of the cabinet.

1. Make sure that you backup all customer data, take the subsystem from the customer, power down the subsystem, and unplug the cabinet's power cord.
2. Identify and label the power cords that go to a particular DCPS as well as the channel cables that go to a specific controller.
3. Unplug and remove the devices that need to be repositioned.

CAUTION:

Many disk storage devices are very heavy and sensitive to shock. Please handle devices with extreme care.

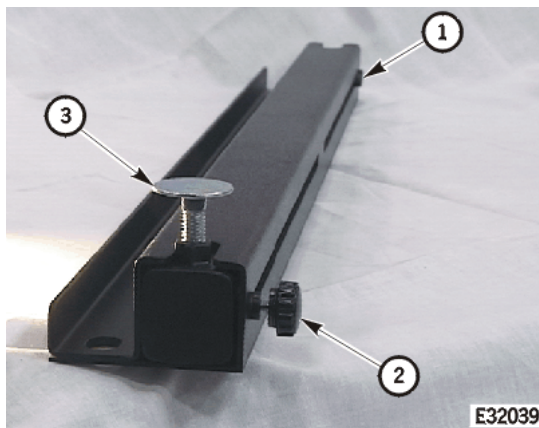
4. Remove the two 10-32 Torx screws on each set of mounting rails. Leave the bottom set, unless you are going to attach slider tray rails.
5. If you are installing a server (recommended on the bottom of the cabinet) that will require it to be extended out of the cabinet for maintenance, proceed to [“Outrigger Extender Leg Installation,”](#) or skip forward to the [“Slider \(Sliding Tray\) Installation” on page 3-5](#) or to Installing New Devices in the CBNT M03, whichever is appropriate.

Note: Always add your devices (heavier devices first) one at a time. Make sure you get help lifting any heavy device.

Outrigger Extender Leg Installation

Outrigger extender legs or tip-prevention legs are required to enable service personnel to slide out the server and perform maintenance.

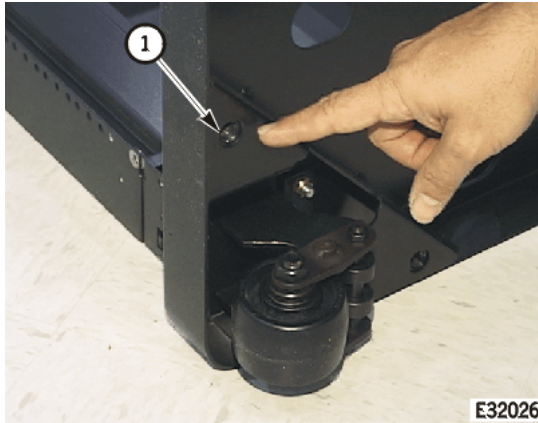
6. Place the extender leg into the housing and assemble the parts as shown below (tighten each part so it will not come loose).



Extender Leg Assembly (shown upside down, E32029)

1. Black screw to prevent leg from extending out too far
2. Locking knob to secure the leg in either the extended or the non-extended position
3. Leveling foot (unscrews to meet the floor when extended)

7. Make sure the black screw (in the long narrow slot and at the rear of the housing) is tight, but yet allows the extender leg to move in and out.
8. Now obtain access to the bottom of the base plate (**without** tipping the cabinet over as shown in the photograph), and locate (by touch) the front and back securing screw holes (see the following photo).

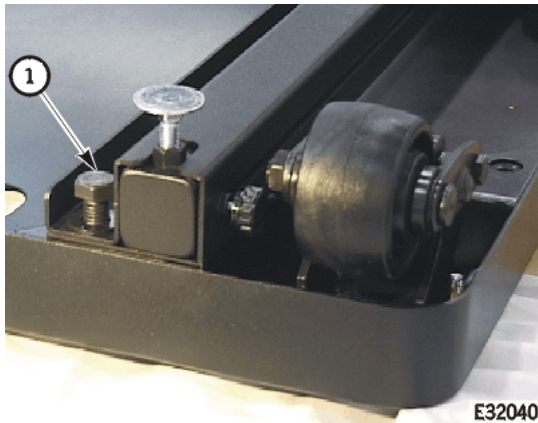


Base Plate (front left securing hole, E32026)

1. Screw hole for mounting the extender leg assembly to the base plate

Note: You will need to locate both holes, and prop the extender leg assembly into place underneath the base plate. Make sure that the leveling foot is toward the front and the flange is toward the inside.

9. Place the large 1/2" bolt and its washer through the hole in the extender leg assembly and thread (by hand) it into the weld nut (see the following photograph).

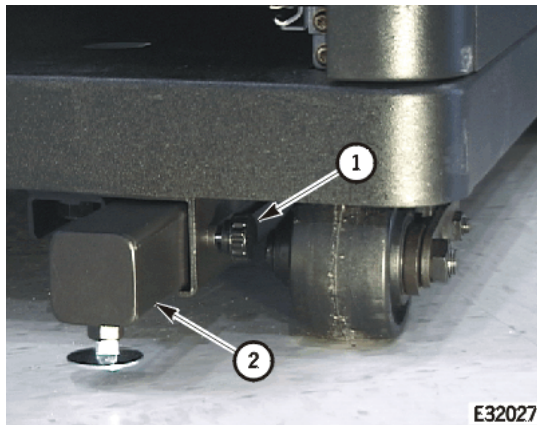


Base Plate (upside down) and the Extender Leg Assembly (E32040)

1. Securing bolt

Note: There are two bolts per housing (one in front, one in back)

10. Using a 3/4" socket, tighten the large 1/2" bolt to secure the extender leg assembly to the base plate as shown in the following figure. Note that the flange is toward the inside. Torque to 21 ft-lbs. Repeat for the opposite side.
11. Make sure the silver leveling feet and the locking knob are snug.
12. Verify that the extender leg assembly (right side) is similar to the following photograph.



Extender Leg in its Housing (right side, E32027)

1. Locking knob
2. Extender leg (slightly extended)

13. Continue to the next upgrade activity required.

Remember: Always start by “stacking” the cabinet with devices from the bottom up. Heavier devices need to be placed toward the bottom, especially if they will be extended out for maintenance.

Slider (Sliding Tray) Installation

Note: The installation of a server slider assembly requires an empty cabinet. Because various servers weigh in excess of 100 lbs, additional help is needed. Use 1 or 2 additional people to turn the server upside down (or on its side) to add a mounting plate and to lift heavy units into place.

14. Attach front and back brackets to each slide using 8-32 slotted pan head screws (photograph E32028 on [page 3-7](#) shows back mounting hardware and screw).
15. Check the locking lever orientation so that the unlocking of the inner-most slide requires a downward motion, and then arrange the slides as either left or right. See the following photograph.

Note: The illustration below shows the rail locking lever that must be pushed down (or in some cases, pulled up) in order to unlock the extended inner-most rail, thereby allowing you to slide the rails back into place (helpful hint).

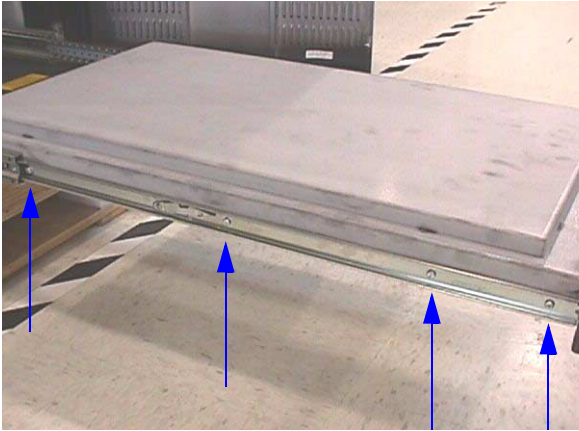


Slider Tray Lock

1. Push down slide locking levers on both the left and right side to unlock.

Note: Push levers down on both sides to unlock.

16. Assemble the inner-most portion of both slides onto the larger slide tray. Refer to the photograph below, noting the four Torx screws.

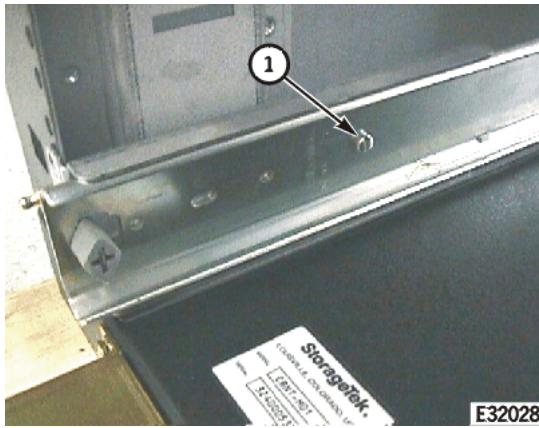


Inner-most Portion of the Slide

1. Use 8-32 pan-head Torx screws to secure the slide tray to the left and right slides.
 - Torque screw to 18 inch-lbs.

Note: This assembly process is done before attaching anything to the frame of the cabinet. The assembly will now be referred to as a slider tray assembly.

17. Now position the slider tray assembly with the back of the slides (open ends) as shown below, and secure the slider tray assembly to the front and back frame on each side of the cabinet using the Torx screws and clip-nuts supplied.



Back end of Slider Tray Rail (E32028)

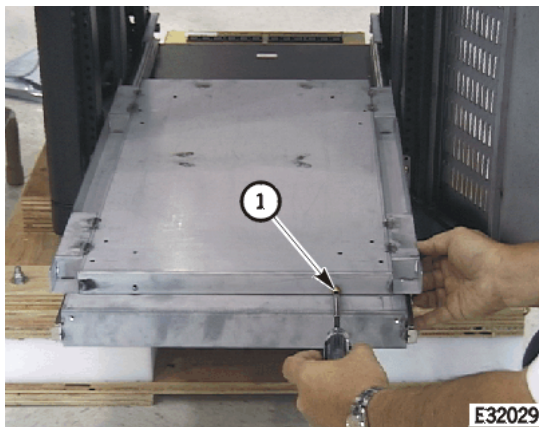
1. 8-32 pan-head Torx screw helping to secure the slide to the back bracket.
 - Torque screw to 30 inch lbs.

Note: Front and back hole markings are stamped into the mounting bracket, which is not entirely visible in this photograph.

The front and this back bracket attach to the frame using 10-32 Torx screws.

Note: It may be necessary to remove lower screws on the front and back of the side member to attach the rails to the cabinet (note the stopper, as shown above, is positioned to the rear of the cabinet on both slides).

Note: In your kit you will also find the server mounting plate. If you will be installing a server, set this piece aside to be used during the server installation section. If, however, you do not have a server to add at this time, install the sheet metal insert by positioning it with the cavity down, oriented so the flange and two screw holes are in the front. Then place the insert over the slide tray as shown below, and attach two 10-32 Torx sems screws to the front with a slight torque.



Server Mounting Plate (installed on top of slider tray assembly—awaiting a server, E32029)

1. Securing screw—right side

18. Proceed to additional assembly instructions as needed.

Install Mounting Rails

The following cabinet rules must be obeyed when stacking.

- Position/reposition blanks toward the top.
- Install tape drives above disk.
- Only plug subsystem components into the PDU.

Note: Make sure heavier items and extended items are positioned to the bottom of the cabinet.

19. Plan your U spacing needs, or install mounting rails as needed (as you go).
20. Using two supplied 10-32 torx sems screws and the T25 Torx driver, fasten the new mounting rails to the cabinet (just above the top device). Per StorageTek's 2925 specification, torque screws to 18 inch-lbs.
 - a. Temporarily position the mounting rail in place, and ensure it is level.
 - b. Identify the chassis holes that line up with this position, and then attached clip nuts (as shown below) to the appropriate chassis holes.



Clip nut attachment to chassis

- Position the nut so that it is in back.
- Slide the clip nut onto the chassis sheet metal.
- Make sure that the sheet metal hole locks into place between the clip nut front plate (shown) and the retaining nut.

Note: You should be able to see the nut's threads through the chassis hole.

21. Next, secure the mounting plates to the clip nuts using 10-32 Torx screws.
22. Proceed to this next appropriate section.

WARNING:

Installations of heavy devices that are extended beyond the footprint of the cabinet must have outrigger extender legs installed.

Device Installation

23. Starting from the bottom, install one device at a time until you have populated the cabinet with all of your devices as per your stack-up plan.
24. Mark the position where clip-nuts are needed to secure the devices to the frame, and install the clip-nuts as described in the previous section.

25. Secure the devices into place with 10-32 Torx screws.

WARNING:

Be sure to read the AC Power Consideration section at the end of this chapter.

You are ready to attach/reattach power and signal cables to your devices. Please refer to the installation instructions that came with the new units and follow all special instructions supplied. Refer to product manuals as needed.

Whenever an upgrade is being made to an existing set of storage devices that currently have customer data on the drives, you will want to ensure that the host is still able to communicate to all previously data-filled drives. A SCSI/FC-AL interface test may be requested. Make absolutely sure that all channel cables attach to the exact same storage devices, and that all host and SCSI address switches are set per the new subsystem configuration.

26. Proceed to the next appropriate section.

Door Assembly Procedure

The following steps assume that a standard CBNT M03 door is being added. If, however, a special door is being added to cover just one device, then refer to the instruction in the *CBNT M02 User's Guide*.

27. Unpackage the door and its hardware.
28. Remove the snap-on top trim piece; and install the new trim piece.
- Insert 10-32 Torx screws into the top member retainer using an allen wrench. Tighten to a minimum of 18 inch lbs. See photograph below.



Top Member Trim Piece Retainer

1. Top Member Trim Piece Retainer (left side), shown with a 10-32 Torx screw installed to secure the trim piece to the frame.

Note: These screws are very important. They will help support the door and ensure proper alignment.

Note: To align the trim piece retainer holes over the frame holes, slightly tap the left or right side of the trim piece with a rubber mallet.

29. Next, install the door latch catch. Refer to the following photograph and instructions.



Door Latch Catch Mounting

1. Position the catch as shown on the left side of the frame.
2. Align with the holes in the frame, and install two Torx screws.
3. Tighten each screw to 12 inch lbs.

Note: This photograph shows the left side of the cabinet.

30. Now moving to the lower right corner, install the door's weight-bearing hardware. Refer to the following picture and its instructions.

Note: It is very important that this hardware is very secure. Torx screws must be tightened to a minimum of 18 inch-lbs.



Door Supporting Hardware Mounting

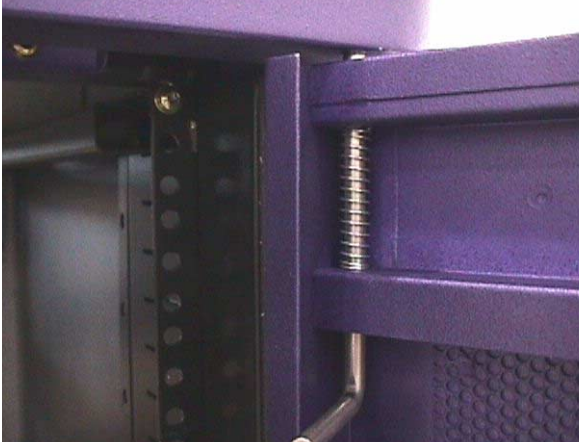
1. Remove two plastic plugs in the two lower-right holes on the frame.
2. Position the hardware behind the front edge of the base plate as shown.
3. Align with the holes in the frame, and install two Torx screws, with the pan-head Torx screw on the right.
4. Tighten each screw to 18 inch-lbs.

Note: This photo shows the lower right corner of the cabinet.

31. Place one washer on top of the pin.
32. Now (assuming you have a spring-loaded arm already installed on your door) lift the door into place, and position it onto the pin as show above.

Note: If you don't have the spring-loaded arm attached, assembly this piece onto the door using pliers to insert the C clamp onto the groove in the arm. It is also helpful to have someone hold back the spring as you install the C clamp. If properly assembled, the C clamp must compress the spring as you pull down on the arm handle.

33. Secure the spring-loaded arm into the top member hole (right side) as shown below, and follow the additional alignment instructions.



Door Hinge Spring-Loaded Arm

1. Gently close the door and check alignment.
2. Make sure you are able to lock the door and remove the key.
3. Remove or add washers as needed to raise or lower the door to the desired functional position.

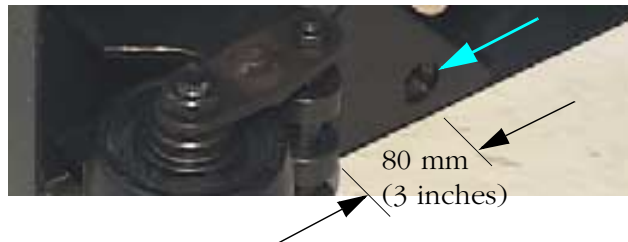
34. Mark the contact location of the magnetic catches on the top and bottom end of the door (insert these catches if not already installed).
35. Remove the adhesive protection, and install the metal strips to the frame where contact is made. Refer to the Top Member Retainer photograph on the previous page.
36. Close and lock the door, remove the key, and verify that the door is indeed locked.
37. As needed, adjust hardware to improve the alignment of the door.

This concludes upgrade instructions. The following sections cover the stabilizing feature and the alternate AC power input modification.

Stabilizing Hardware

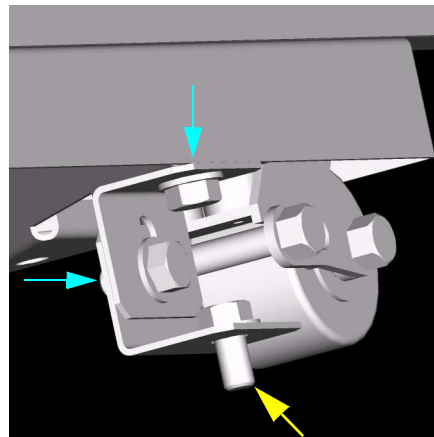
For stabilizing feature orders (to secure for earthquakes, ships, etc.), use the following instructions to prepare your cabinet for the customer site installation, thereby minimizing the possibility of damage to your cabinet and its contents.

1. Locate the four hardware mounting holes on the bottom of the baseplate. See the following photograph.



Each hole is 3 or 4 inches from the castor on both the left and right side of the baseplate.

2. Assemble securing hardware as shown below.

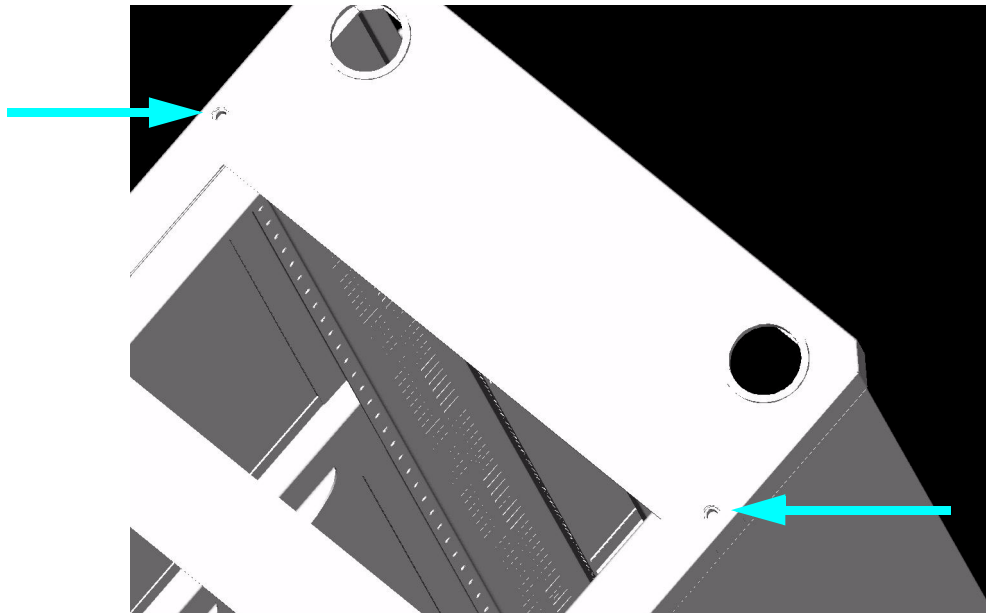


Two 1/2-13 x 1 inch long bolts (with washers) are supplied for each set of securing bracket hardware.

all other hardware must be supplied by the customer to fit their specific mounting requirements.

3. Torque bolts to 36 ft-lbs, and secure to the floor with customer-supplied hardware.
4. Use this same process for additional securing points on both the top and the bottom of the cabinet to finish your earthquake protection installation.

Note: Mounting holes are on the cabinet's top member as shown below.

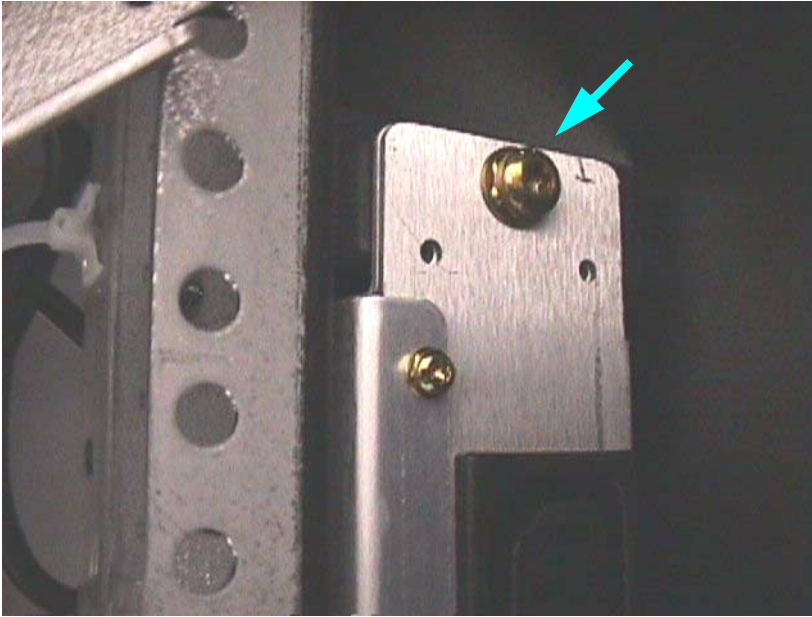


Note: The preceding illustration also shows the latest cooling enhancement, allowing more heat to escape from the top of the cabinet. This design facilitates a greater amount of heat exchange, and helps improve the reliability of the StorageTek devices installed into a fully populated cabinet.

Alternate AC Power Inputs

Also shown in the preceding illustration are access ports for routing AC power cords out the top of the cabinet. If this is the cabinet configuration you desire, you may route the AC power cord up through the top or turn each PDU upside-down to provide more power cord length. If this is the case, use the following instructions to guide you through this process.

1. Stop all operations and remove power to the cabinet.
2. Remove the top (see below) and bottom 10-32 Torx screws from the PDU.



Top portion of the right-side PDU, showing the 10-32 Torx screw

3. Remove the PDU and route its AC power cord up through the access port in the top member.
4. Secure the PDU by reinstalling the 10-32 Torx screws.
5. Repeat Steps 2 through 4 for the other PDU.

This completes the alternate AC power input modification for the cabinet.

AC Power Considerations for the CBNT M03

The M03 cabinet has two 30 amp PDUs. Each PDU is rated by UL for a maximum continuous output of 24 amps. Each PDU supplies power to the same appliance (device) with PDU A supplying power to one side and PDU B supplying power to the other side (assuming the appliances use redundant DC power supplies). If the appliance is rated at 1 amp, then the load that should be used to calculate the current is 1 amp (ignoring the fact that load-sharing is taking place and that only 0.5 to 0.6 amps is actually being drawn through the appliance). Load-sharing improves the life of the DC power supply and improves its reliability; however, when calculating loads, one should calculate for the whole load. This will make sure that no more than 24 amps is drawn from any one PDU.

The PDUs are designed to safely supply a maximum of 24 amps. Typically, this current is split between the two PDUs with each supplying approximately 12 amps. If, however, the 24 amp current maximum is supplied via one PDU, all of the current-carrying burden would be on the DC power supplies that are attached to it.

Current loads should be calculated by adding up the current ratings of each of the appliances (devices), and the total should not exceed 24 amps. Make sure separate grid power is used to supply power to separate and redundant DC power supplies (provided subsystem devices have this feature). This means that PDU A supplies power to one DC power supply, and PDU B supplies power to the other (redundant) DC power supply on the same device.

CAUTION:

The customer-supplied power receptacles should be coming from two separate and independent power sources so as to maximize power redundancy and eliminate chances that your disk storage subsystem will be faced with a crisis.

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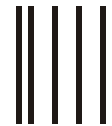
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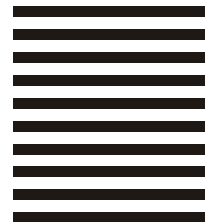
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