TrueNAS® X-Series Unified Storage Array Basic Setup Guide

Version 1.82

Contents

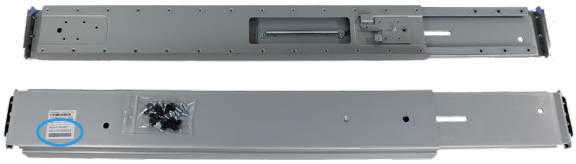
The TrueNAS X-Series Unified Storage Array is a 2U, 12-bay, hybrid unified data storage array.

1 Unpacking the Unit

TrueNAS units are carefully packed and shipped with trusted carriers to arrive in perfect condition.
If there is any shipping damage or missing parts, please take photos and contact iXsystems support immediately at support@ixsystems.com, **1-855-GREP4-iX (1-855-473-7449)**, or **1-408-943-4100**.

Please locate and record the hardware serial numbers on the back of each chassis for quick reference.

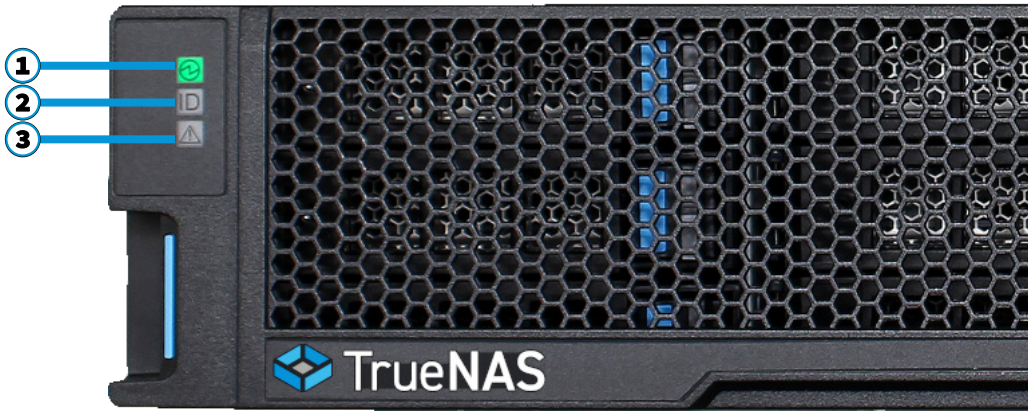
Carefully unpack the shipping boxes and locate these components:

	X-Series Unified Storage Array
	X-Series Bezel
	Set of rackmount rails. The rails have a specific front end, identified by a label visible on the left above. The front ends of the rails must be installed facing the front of the rack.
	A total of 12 populated or empty “air baffle” drive trays. Trays must be installed in all bays to maintain proper airflow for cooling. Up to ten drive trays are packed in a cardboard tray. Additional drive trays are packed with the accessory kit.
	Accessory kit with 2 IEC C13 to NEMA 5-15P power cords, 2 IEC C13 to C14 cords, and a set of velcro cable ties.
	Black USB to 3.5mm, 3.3V serial cable
	Rail Extenders for racks over 30” (762mm) deep

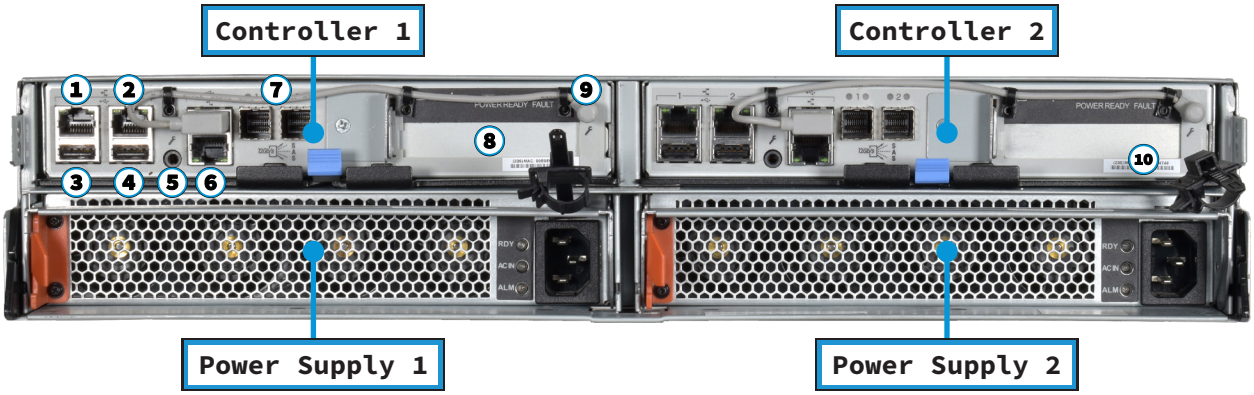
2 Become Familiar with the X-Series System

The X-Series has front panel indicators for power, locate ID, and fault. The fault indicator is on during the initial power-on self-test (POST) and turns off during normal operation. It turns on if the TrueNAS software issues an alert.

1. Ready (Green)
2. Locate ID (Blue)
3. Fault (Amber)



The X-Series has one or two storage controllers in a side-by-side configuration.



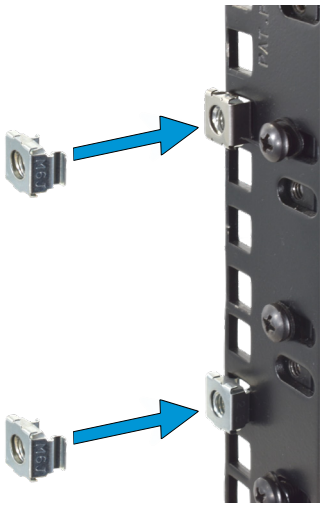
1. Gigabit Ethernet connector 1
2. Gigabit Ethernet connector 2
3. USB device (reserved, do not remove)
4. USB 2.0 connector
5. Out-of-Band (OOB) serial port (3.5mm)
6. Out-of-Band Management Ethernet connector
7. HD mini SAS3 connectors 1 & 2
8. PCIe x8 expansion port
9. System console port (reserved)
10. MAC address label

3 Rail Kit Assembly

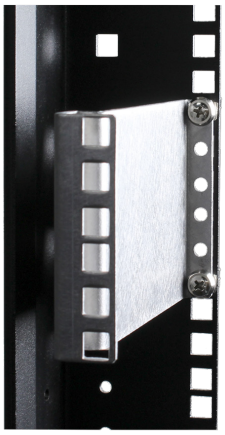
On racks that are 30 inches deep or less, skip to "**3.2 Rail Spring"**.

3.1 Rail Extenders

Racks from 31 to 36 inches deep require installation of the included rail extenders. For these deeper racks, install cage nuts on the outside rear of the rack. **The tabs on the cage nuts must be horizontal as shown.**



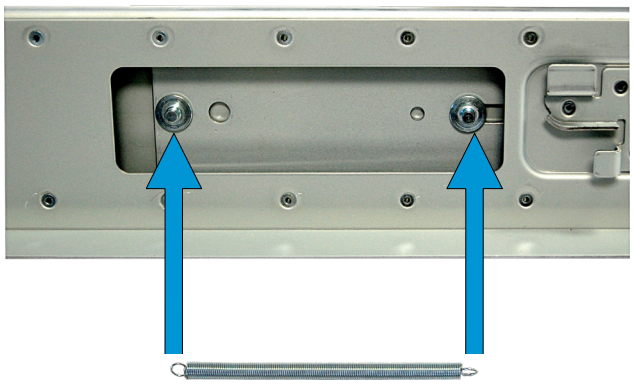
Using the included bolts, install the rail extender inside the rear of the rack. Repeat the process for the second extender, which is a mirror image of the first.



Extender Installed
Viewed from Inside the Rack

3.2 Rail Spring

If not already present, install a spring on the silver posts in the side of each rail.

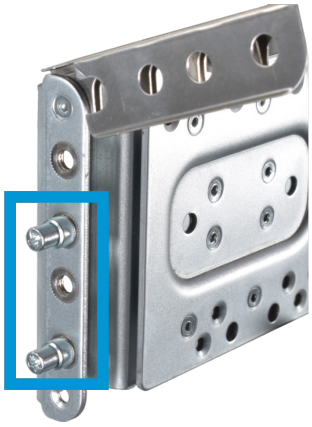


3.3 Attaching Rails to the Rack

Chassis rails are configured to attach to round hole racks. Additional pins are included in the accessory kit to configure the rails for square or 4mm hole racks. To reset the rails to fit a square or 4mm hole rack, unscrew the pins at each end of the rails and replace them with the correct pins.

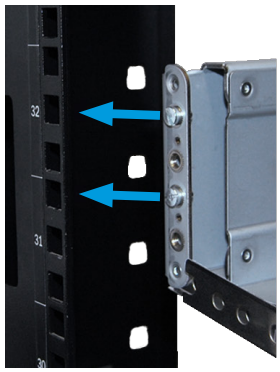
Round Hole Rack Pins

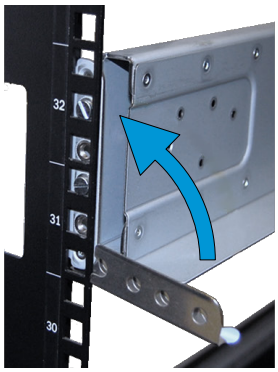
Square Hole Rack Pins



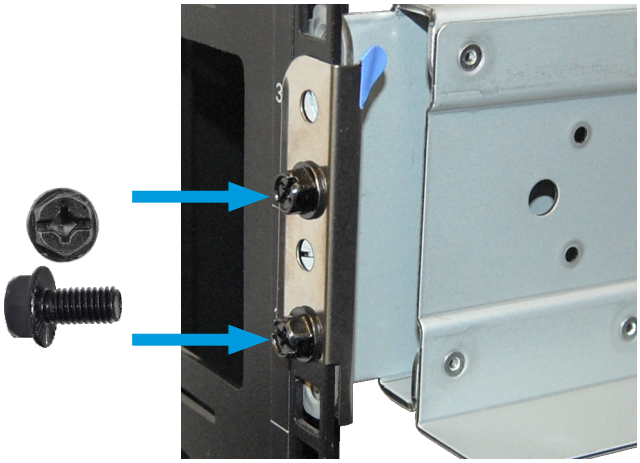
4mm Hole Rack Pins

To secure a rail to the rack, open the clamp latches on the ends of each rail. Place the rail in the rack with the front end toward the front of the rack, aligning the pins on both ends of the rail with the mounting holes in the rack. Swing the clamp latch closed to hold the rail in place. Use two of the supplied screws to secure the back end of the rail in place. Repeat the process for the second rail.





Caution: Two people are required to safely lift the chassis for rack installation or removal. Do not install drives until after the chassis has been installed in the rack, and remove all drives before removing the chassis from the rack. Carefully place the chassis onto the rails mounted in the rack. Push the chassis in until the ears are flush with the front of the rack. If needed, attach the bezel. Use two of the supplied screws to secure each ear to the rack.



4 Install Drive Trays

TrueNAS appliances only support qualified hard drives and SSDs. Contact the Sales Team if you need more drives or replacements. Adding unqualified drives to the system voids the warranty. Call Support if drives are improperly installed in trays.

Drive trays are used to mount drives in the chassis. Each drive tray has two status LEDs. The top LED is blue when the drive is active or a hot spare. The bottom LED changes to amber if a fault has occurred.

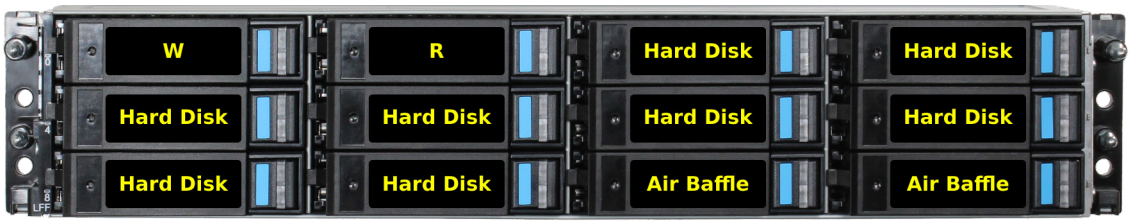
A tray must be placed in each drive bay to maintain proper airflow for cooling. If fewer than twelve drives are connected, empty “air baffle” trays must be placed in the empty bays.

A standard drive tray installation order simplifies support and is strongly recommended:

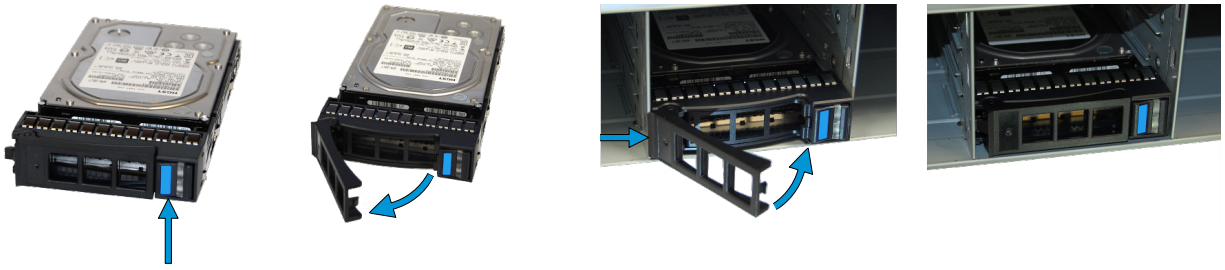
- SSD drives for write cache (W), if present
- SSD drives for read cache (R), if present
- Hard drives or SSD drives for data storage
- Air baffle filler trays to fill any remaining empty bays

Install the first drive tray in the top left drive bay. Install the next drive tray to the right of the first. Install remaining drive trays to the right across the row. After a row is filled with drives, move down to the next row and start again with the left bay.

This example shows the proper order for a write cache (W) SSD, a read cache (R) SSD, eight hard drives, and two empty air baffle trays.



To load an individual drive tray into a bay, press the blue button to open the latch. Carefully slide the tray into a drive bay until the left side of the latch touches the metal front edge of the chassis, then gently swing the latch closed until it clicks into place.

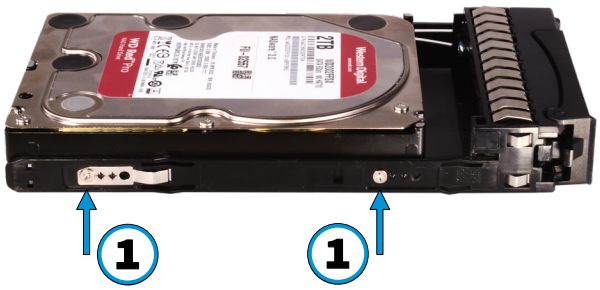


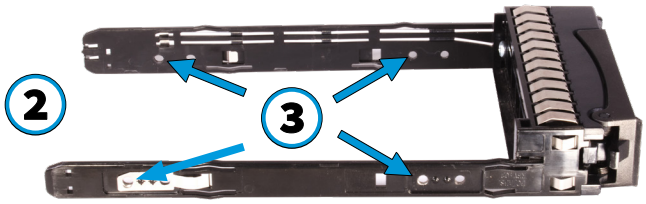
4.1 Replacing Drives

Depending on the configuration ordered, X-Series drive trays come preinstalled with 3.5” drives, 2.5” drives with adapter, 2.5” read intensive (RI) drives with interposer and adapter, and/or empty air baffles that preserve system air flow. Drives that lose functionality can be removed from the tray and a new drive installed in its place or a system upgraded by removing the air baffles and installing new drives ordered from iXsystems.

4.1.1 3.5” Drive Replacement

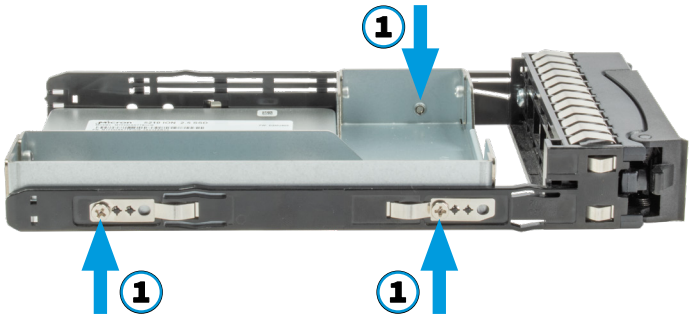
Place the tray on a flat surface and remove the four screws holding the drive to the tray, two on each side (1). Place the new drive in the tray with the drive connector to the rear of the tray (2), and secure the hard drive in the tray with four screws, two on each side. (3).

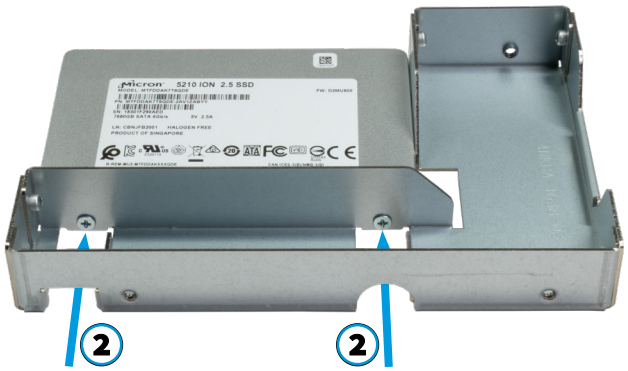




4.1.2 2.5” Drive Replacement

Place the tray on a flat surface and remove the three screws holding the adapter to the tray, two on one side and one on the other (**1**). Remove the adapter from the tray and remove the two screws that hold the 2.5” drive to the adapter (**2**). Follow this process in reverse to add the new 2.5” drive to an adapter and attach to the drive tray.



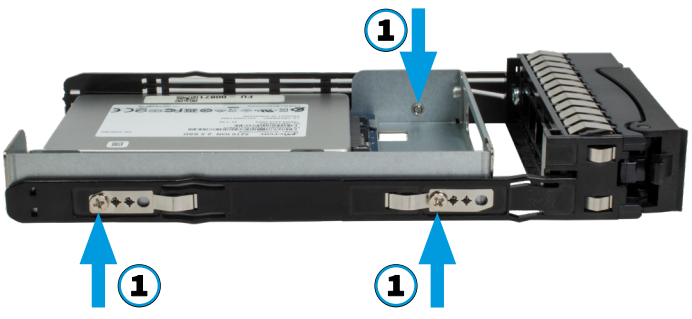


4.1.3 2.5” Read Intensive Drive Replacement

Warning: the interposer is considered part of the 2.5” drive and must be removed with it. Attempting to reuse an interposer can result in a system malfunction or data loss!

Place the tray on a flat surface and remove the three screws holding the adapter in place, two from one side and one on the other (**1**). Remove the adapter from the tray and remove the three screws that hold the 2.5” drive and interposer in place, two from the side and one underneath the adapter (**2**). Gently lift the 2.5” drive and interposer free from the adapter.

When installing the new drive, follow the previous procedure in reverse, but make sure the edge of the new interposer slides under the retention tab (circled) on the adapter.

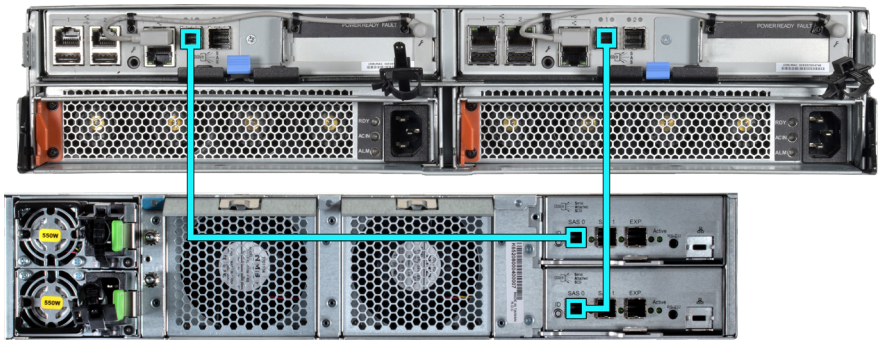


5 Connect Expansion Shelves

To set up SAS between your TrueNAS system and Expansion Shelves, cable the first port on the first TrueNAS Controller to the first port on the first Expansion Shelf Controller. High Availability systems require another cable from the first port on the second TrueNAS Controller to the first port on the second Expansion Shelf Controller. We **DO NOT** recommend other cabling configurations. Contact iX Support if you need other cabling methods.

Warning: When setting up your SAS connections, please adhere to the wiring examples in this guide. Connecting expansion shelves incorrectly will cause errors. Never cable a single controller to different expanders on the same expansion shelf.

Expansion shelves connect to the HD mini SAS3 connectors on the X-Series. For detailed connection instructions and diagrams, refer to the Basic Setup Guide included with your iXsystems TrueNAS expansion shelf or see the on-line SAS Connections Guide. This example shows connecting an X-Series system with an ES24F



6 Connect Network Cables

Network cables vary by configuration and are not included. Please contact iX Support with any questions.

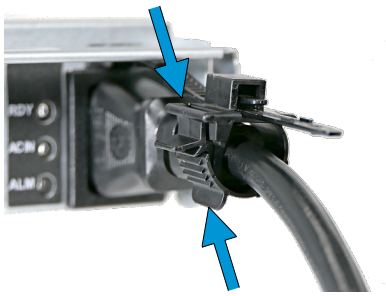
Connect network cables to the Ethernet ports and Out-of-Band (OOB) management port before powering on and configuring the X-Series for the the first time.

You must connect the Out-of-Band management port on the X-Series with a shielded Ethernet cable.

7 Connect Power Cord

If you connected expansion shelves to the X-Series, power on the expansion shelves and wait at least two minutes before connecting power cables to the X-Series. **Do not plug the power cords into a power outlet yet.**

Connect a power cord to the back of one power supply, pressing it into the plastic clamp and pressing on the tab to lock it in place. Repeat the process for the second power supply and cord.



After connecting both power cords to the X-Series, plug them into power outlets. The system automatically turns on when connected to power. This design ensures that the X-Series powers back on after a power failure.

If you want to disconnect the physical power remotely, you can connect the X-Series to a remotely-managed Power Distribution Unit (PDU).

8 Install Bezel (Optional)

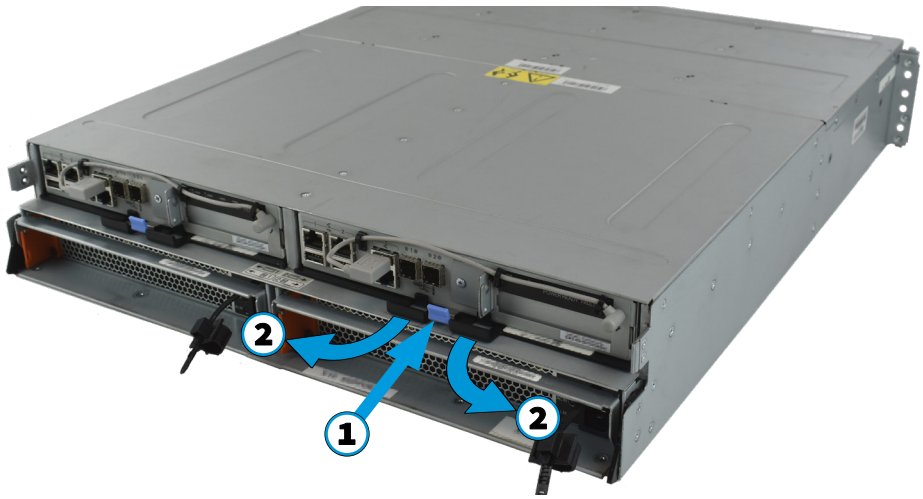
The system does not require the bezel to operate. If desired, install the bezel by screwing in the bezel posts to the system ears. The longer posts go in the top positions on the ears. Align the bezel with the posts on the chassis ears and press it into place. To remove, grasp the bezel from the front and pull away from the chassis.

9 Controller Removal and Installation

Warning: To avoid the potential for data loss, you must contact iXsystems **before** replacing a controller or upgrading to High Availability. See section "14 Contacting iXsystems".

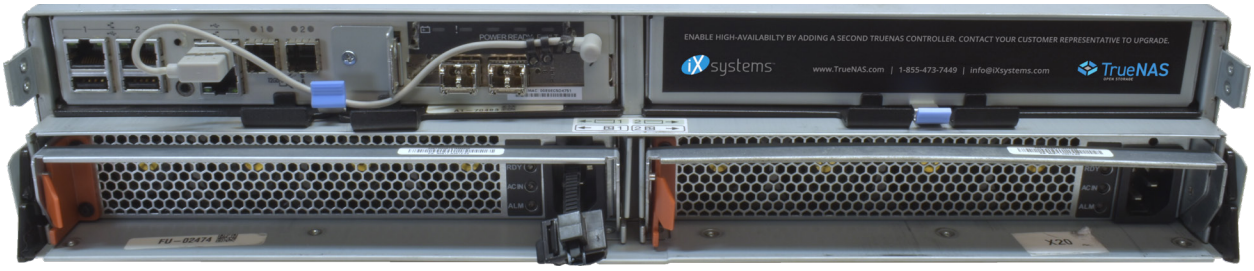
9.1 Removing a Controller

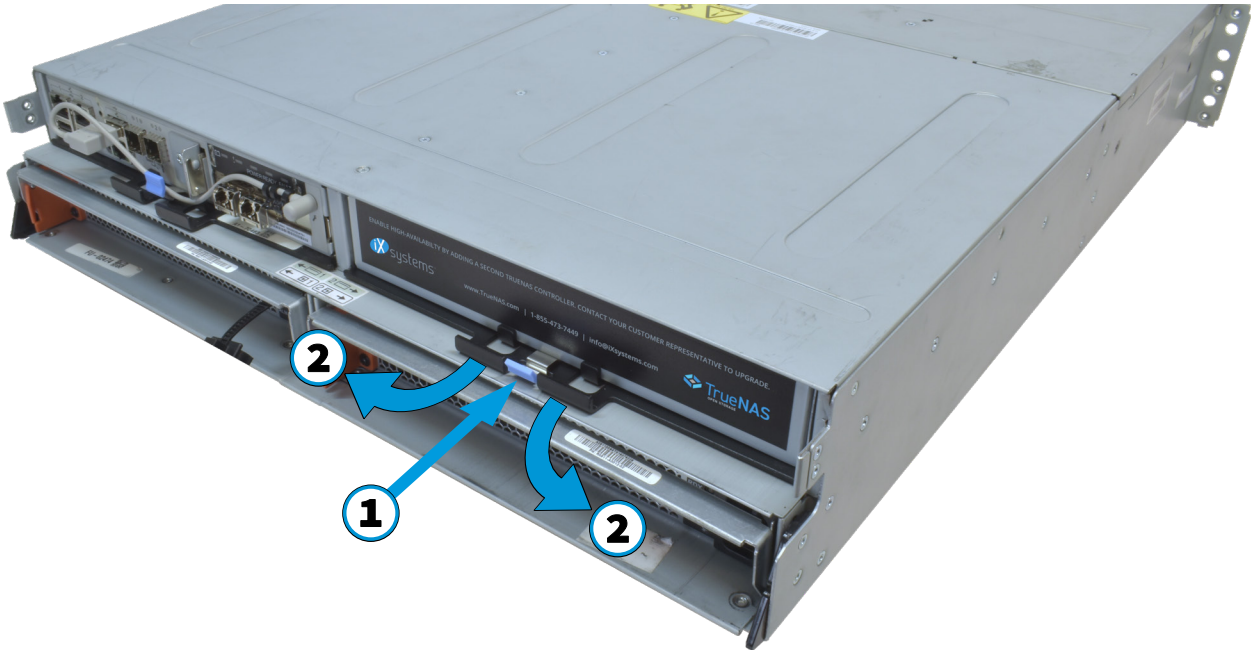
Press in the blue clip on the bottom of the controller to release the two black locking levers. Swing the locking levers outward and pull the controller out of the system.



9.1.1 Removing a Blanking Plate

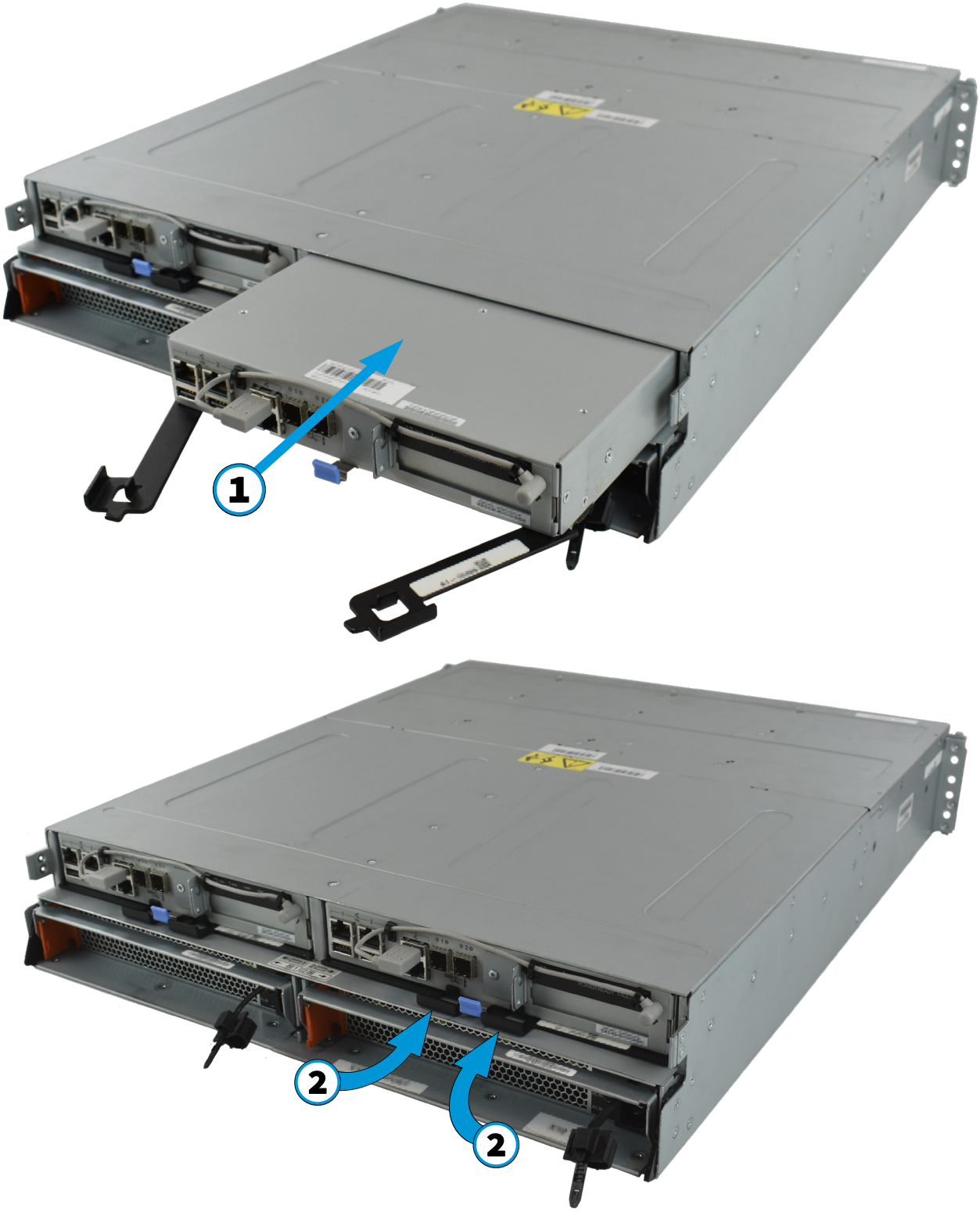
If you purchased your X-Series with only one controller, you can upgrade it by adding a second controller.
To remove the blanking plate from the empty controller slot, press in the blue clip on the bottom of the plate to release the two black locking levers. Swing the locking levers outward and pull the blanking plate out of the system.





9.2 Installing or Adding a Controller

Hold the controller by the sides and align with the opening on the back of the chassis. Slide the controller into the X-Series chassis until it stops (**1**). Swing the locking levers inward until they snap into the blue clip on the bottom of the controller (**2**).



10 Logging in to the TrueNAS Web Interface

The TrueNAS graphical web interface IP address is on the TrueNAS hardware sales order or configuration sheet. The system console also displays it after powering on (see section "11 Direct Connections to the System Console"). Please contact iX Support if the TrueNAS web interface IP address was not provided with these documents or cannot be identified from the TrueNAS system console.

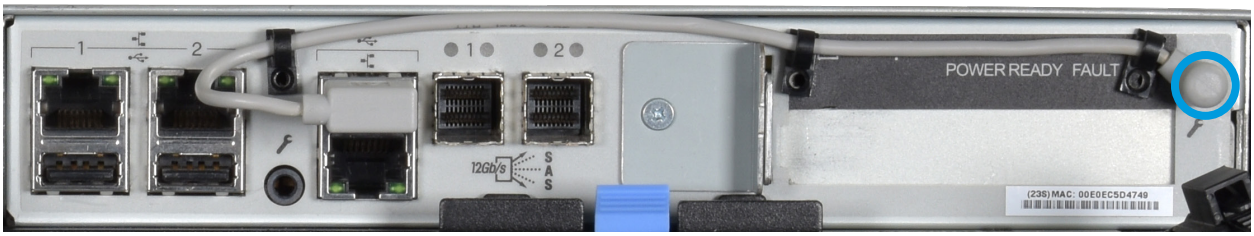
Enter the IP address into a browser on a computer on the same network to access the web interface. To log into the TrueNAS web interface, enter the default credentials:

Username: `root`
Password: `abcd1234`

11 Direct Connections to the System Console

Your system is equipped with the optimal BIOS and IPMI firmware out of the box.
DO NOT UPGRADE your system's BIOS and IPMI firmware.

The X-Series comes with a gray console port cable that connects IPMI to the console. To directly connect a system to the X-Series Console, disconnect the gray cable from the 3.5mm console port and connect the provided black 3.5mm to USB serial cable to the port.



Connect the USB end of the black cable to a computer running terminal software. Set the terminal software to:

```
115200 baud, 8 data bits, 1 stop bit, no parity, no flow control
```

The X-Series console has two modes: SES (SCSI Enclosure Services) mode, and the standard x86 console mode.

If **ESM A =>** or **ESM B =>** is displayed, the X-Series is in SES mode.

Switch to the X86 console mode by typing: `$%^0`

Press `Enter` twice after typing the characters. The normal x86 console is displayed.

To switch back to the SES console, type: `$%^2`

After logging in, the console will display the TrueNAS serial menu and boot/BIOS information.

When finished with a direct connection, be sure to remove the black 3.5mm to USB cable from the console port and reconnect the gray cable!

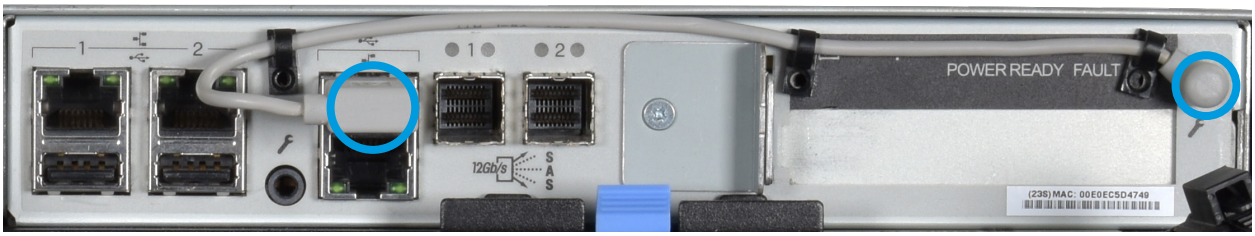
12 Out-of-Band Management

Out-of-Band Management (OOBM) allows you to connect to the TrueNAS hardware and make changes using the system console. You should immediately test to confirm the OOBM Ethernet port IP address is active.
Remote support requires functioning addresses. If iXsystems preconfigured the system, they have set the OOBM interfaces to the requested IP addresses. Otherwise, the OOBM IP addresses default to these static addresses:

- TrueNAS Controller 1: *192.168.100.100*, subnet mask *255.255.255.0*
- TrueNAS Controller 2 (if present): *192.168.100.101*, subnet mask *255.255.255.0*

Viewing or resetting these IP addresses to different values requires directly connecting to the X-Series system using a USB-3.5mm cable and client system with a serial terminal program.

The X-Series comes with a gray console port cable that connects IPMI to the console. Ensure this cable is in place, since Out of Band Management will not work if the cable is not properly connected.



12.1 Configuring Remote Connections

Temporarily connect the included black USB serial cable to the 3.5mm port on the back of the TrueNAS controller.
Be sure to disconnect this cable when done!

The **IPMItool (https://github.com/ipmitool/ipmitool)** utility must be installed on the computer connecting to the X-Series. FreeBSD, macOS, and Linux have package systems which can be used to install IPMItool. For Windows, a simple option is to install **IPMItool** through Cygwin. **Only use *IPMItool* for remote Out-of-Band management on the X-Series. Other IPMI utilities may not work correctly or even damage the X-Series system.**

Connect the serial cable's USB end to a computer running serial terminal software. The device name can vary by operating system. Here are some typical examples:

- Windows: *COM{4}*
- macOS: */dev/tty.usbserial{xynnn}*
- FreeBSD: */dev/cuaU{0}*
- Linux: */dev/ttyUSB{0}*

Set the terminal software to: `38400 baud, 8 data bits, 1 stop bit, no parity, no flow control`

After connecting, you might need to wait for the X-Series to power up, then press `Enter` to display the console menu. When prompted, use these credentials to log in to the interface:

Username / Password: `sysadmin` / `superuser`

To show the current Out-of-Band management IP address:

```
ifconfig eth0 | grep 'inet addr'
inet addr:10.20.1.227 Bcast:10.20.1.255 Mask:255.255.254.0
```

The `ipmitool` command uses a randomized password that is unique to the X-Series system. Replace the `{random}` strings in these examples with the randomized password on the sticker placed on the back of the chassis under the Out-of-Band (OOB) serial port.

To show Out-of-Band network config settings: `ipmitool -H 127.0.0.1 -U admin -P {random} lan print`

To reset the Serial Over LAN system using the Out-of-Band serial port, use the `eth0` IP address.

This example uses the `eth0ipaddress` address: `ipmitool -H eth0ipaddress -U admin bmc reset cold`

Configuring Static IP Addresses

The OOBM system can be set to use a static IP address and netmask. This example shows setting the IP address to `192.168.100.100` with a netmask of `255.255.255.0`, and a default gateway of `192.168.100.1`:

```
ipmitool -H 127.0.0.1 -U admin -P {random} lan set 1 ipsrc static
ipmitool -H 127.0.0.1 -U admin -P {random} lan set 1 ipaddr 192.168.100.10
ipmitool -H 127.0.0.1 -U admin -P {random} lan set 1 netmask 255.255.255.0
ipmitool -H 127.0.0.1 -U admin -P {random} lan set 1 defgw ipaddr 192.168.100.1
```

Configuring DHCP IP Addresses

We do **not recommend** configuring the OOBM IP address with DHCP. However, you can configure the local DHCP server to provide a fixed IP address for OOBM using the MAC address. You can then find the assigned IP address by checking the local DHCP server logs for the MAC addresses affixed to the back panel of each X-Series controller.

To configure DHCP: `ipmitool -H 127.0.0.1 -U admin -P {random} lan set 1 ipsrc dhcp`

Log out of the Out-of-Band management system by typing `exit` and pressing `Enter`.

12.2 Remote Connections

A remote connection requires that the X-Series system has a shielded RJ45 cable connecting the Out-of-Band networking port to the local network.

In this example, *192.168.100.100* is the IP address assigned to the Out-of-Band management interface.

```
ipmitool -I lanplus -H 192.168.100.100 -U admin -a sol activate
```

SOL on another session is displayed when a Serial Over LAN connection is already in use. To reset the Serial Over LAN system from the remote laptop or desktop computer, use:

```
ipmitool -H 192.168.100.100 -U admin bmc reset cold
```

and enter the unique randomized password.

Repeat the `sol activate` command above and enter the randomized password to connect to the console.

To log out of the ipmitool session, press `Enter`, type `~.` and press `Enter`.

13 Additional Resources

The TrueNAS Documentation Hub has complete software configuration and usage instructions. Click **Guide** in the TrueNAS web interface or go directly to:

https://www.truenas.com/docs/

Additional hardware guides and articles are in the Documentation Hub's Hardware section:

https://www.truenas.com/docs/hardware/

The TrueNAS Community forums provide opportunities to interact with other TrueNAS users and discuss their configurations:

https://www.truenas.com/community/

14 Contacting iXsystems

For assistance, please contact iX Support:

Contact Method	Contact Options
Web	https://support.ixsystems.com
Email	support@iXsystems.com
Telephone	Monday-Friday, 6:00AM to 6:00PM Pacific Standard Time: • US-only toll-free: **1-855-473-7449** option 2 • Local and international: **1-408-943-4100** option 2
Telephone	Telephone After Hours (24x7 Gold Level Support only): • US-only toll-free: **1-855-499-5131** • International: **1-408-878-3140** (International calling rates will apply)