TrueNAS® X-Series Basic Setup Guide

Version 1.9

Contents

1 Introduction

The TrueNAS X-Series is a 2U, 12-bay, hybrid unified data storage array. It has redundant power supplies and up to two TrueNAS storage controllers.

You system comes with the TrueNAS operating system preloaded.

Review the safety considerations and hardware requirements before installing an X-Series system into a rack

1.1 Safety

1.1.1 Static Discharge

Static electricity can build up in your body and discharge when touching conductive materials. Electrostatic Discharge (ESD) is harmful to sensitive electronic devices and components. Keep these safety recommendations in mind before opening the system case or handling non-hot-swappable system components:

- Turn off the system and remove power cables before opening the case or touching internal components.
- Place the system on a clean, hard work surface like a wooden tabletop. Using an ESD dissipative mat can also help protect the internal components.
- Touch the metal chassis with your bare hand to dissipate static electricity in your body before touching any internal components, including components not yet installed in the system. Using an anti-static wristband and grounding cable is another option.
- Store all system components in anti-static bags.

You can find more preventative tips and details about ESD at https://www.wikihow.com/Ground-Yourself-to-Avoid-Destroying-a-Computer-with-Electrostatic-Discharge.

1.1.2 Handling the System

We recommend at least two people lift a TrueNAS system.

> Never attempt to lift a TrueNAS system loaded with drives! Install the system in a rack before adding drives. Remove drives before de-racking the system.

Hold the system from the sides or bottom whenever possible. Always be mindful of loose cabling or connectors and avoid pinching or bumping these elements whenever possible.

This document uses "left" and "right" according to your perspective when facing the front of a system or rack.

2.1 Requirements

We recommend these tools when installing a TrueNAS X-Series in a rack:

- #2 Phillips head screw driver
- Flat head screw driver
- Tape measure
- Level

2 X-Series Components

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

Rail kit and hardware. The rail front ends are labeled. You must install the front ends of the rails facing the front of the rack.

12 populated or air baffle drive trays. Up to ten drive trays arrive in a cardboard tray. Additional drive trays arrive with the accessory kit.

Accessory kit with two IEC C13 to NEMA 5-15P power cords, two 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 more than 30" (762mm) deep

2.1 Front Indicators

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.

Light	Color and Indication
⏻	Green: System ready
ID	Blue: Locate ID active
⚠	Amber: Fault / Alert

2.2 Rear Components and Ports

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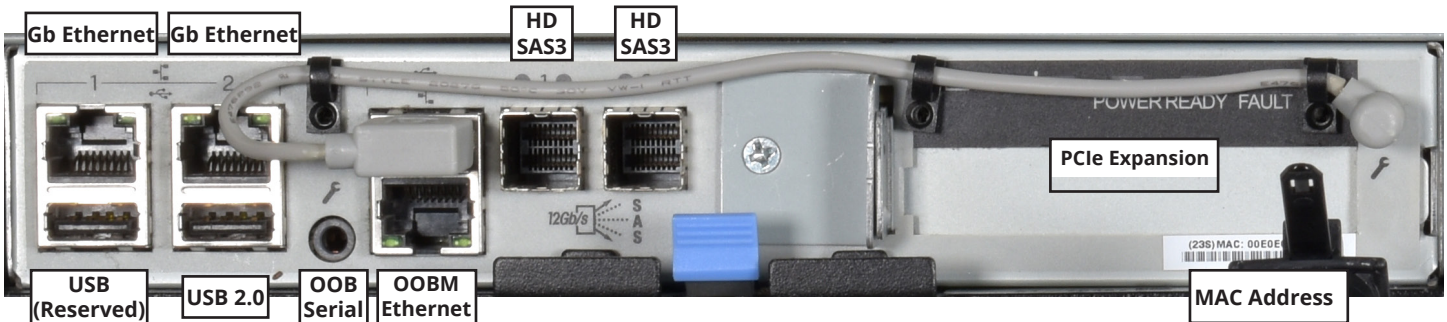
3 Assemble Rail Kit

If your rack is 30" deep or shorter, skip to section "3.2 Rail Spring".

3.1 Install Rail Extenders

Racks that are 31" to 36" deep require the included rail extenders. Install cage nuts on the outside-rear of the rack.

Warning: The tabs on the cage nuts must be horizontal as shown.

Using the M5 screws, install the rail extender inside the rear of the rack. Repeat the for the other side.
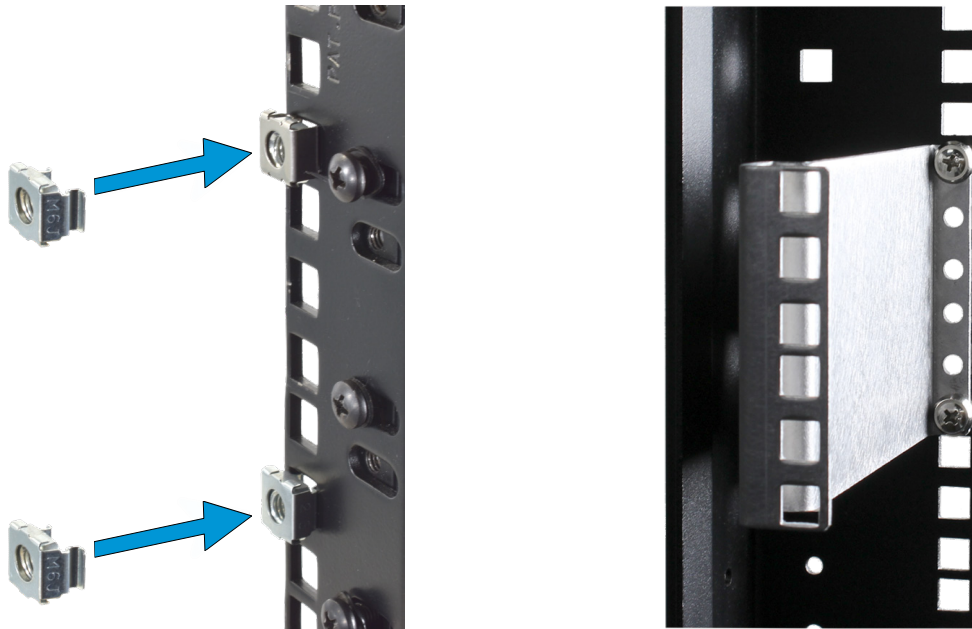
3.2 Install Rail Spring

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

3.2 Install Rack Rails

Chassis rails attach to round hole racks by default. The rail kit includes additional pins to configure rails for square or 4mm hole racks. To reconfigure the rails, unscrew the pins at each end and replace them with the correct pins.
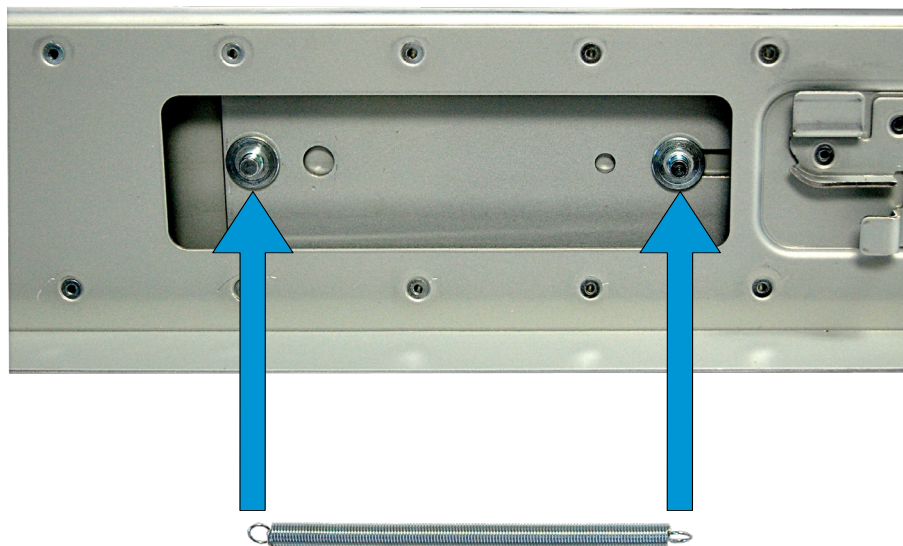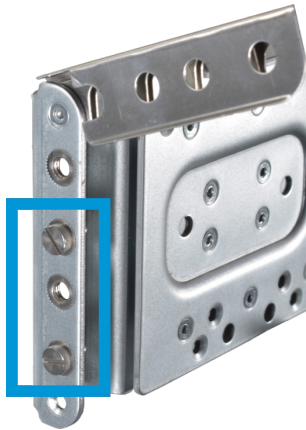
Round Hole Rack Pins   **Square Hole Rack Pins**   **4mm Hole Rack Pins**

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. Align 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 M5 rail screws to secure the back end of the rail in place. Repeat the process for the second rail.
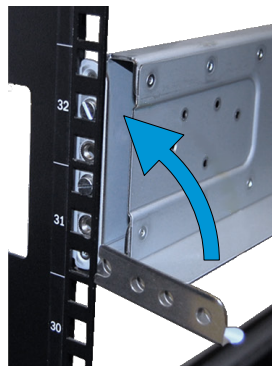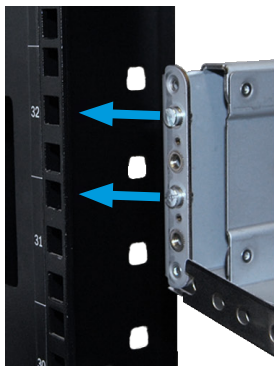
The clamp latch secures the rail to the rack before you install the M5 rack screws through the system ears. Modifying or not using the clamp latches increases the risk of system damage and personal injury.

Two people should lift the X-Series. Do not install drives until you secure the chassis in the rack. Remove all drives before removing the chassis from the rack. Carefully place the system on the rails, then push the system in until the ears are flush with the rack. Use two black M5 rack screws to secure each ear to the rack.
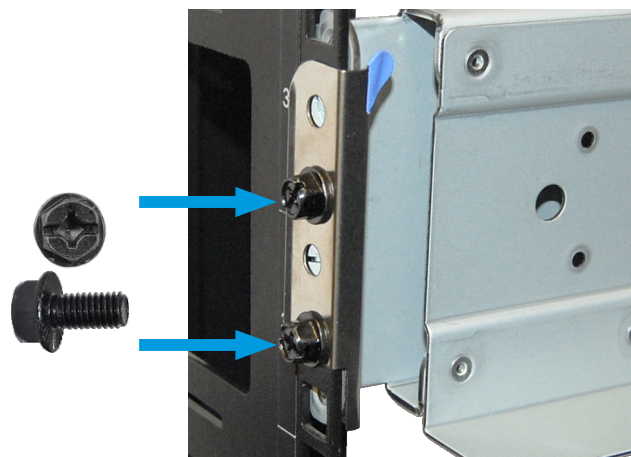
4 Install Drive Trays

TrueNAS appliances only support qualified hard drives and SSDs. Contact Support 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 have two LEDs. The top LED is blue when the drive is active or a hot spare. The bottom LED is amber if a fault has occurred.

You must place a tray 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. We strongly recommend using a standard drive tray install order to simplify support:

- SSD drives for read cache (R), if present
- SSD drives for write cache (W), 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 bay. Install the next drive tray to the right of the first. Install remaining drive trays right across the row. After you fill a row with drives, move down to the next row and start with the left bay.

This example shows the proper order for a read cache (R) SSD, a write cache (W) SSD, nine drives, and one air baffle.

To remove an air baffle, press the blue button to open the latch, then pull the air baffle out of the system.

To install a 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.
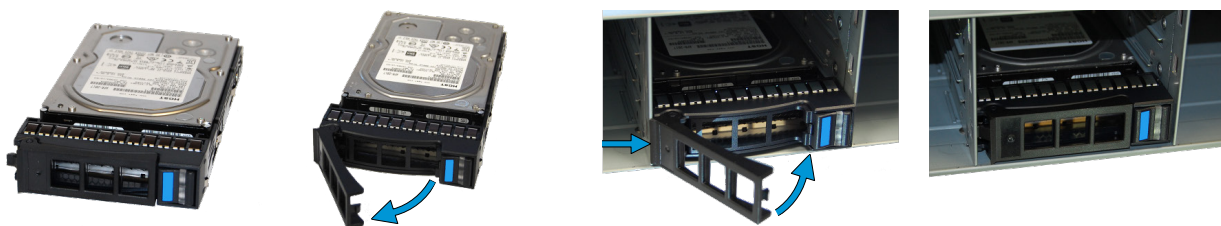
5 Replace or Upgrade Drives

Depending on your configuration, X-Series drive trays come preinstalled with 3.5" drives, 2.5" drives with adapters, 2.5" read intensive (RI) drives with interposers and adapters, or empty air baffles that preserve system air flow. You can remove drives that lose functionality from the tray and install new drives in their place. You can also upgrade your system by removing the air baffles and installing new drives from iXsystems.

5.1 3.5" Drive

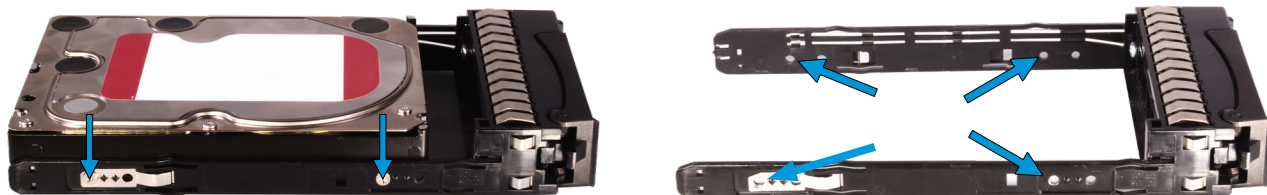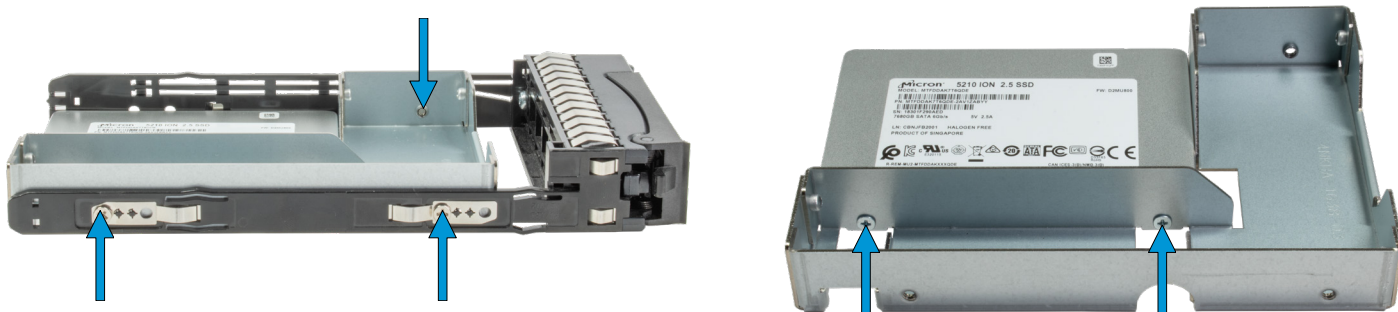Place the tray on a flat surface and remove the four screws holding the drive to the tray, two on each side. Place the new drive in the tray with the drive connector to the rear of the tray, and secure the hard drive in the tray with four screws, two on each side.

5.2 2.5" Drive

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. Remove the adapter from the tray and remove the two screws that hold the 2.5" drive to the adapter. Follow this process in reverse to add the new 2.5" drive to an adapter and attach to the drive tray.

5.3 2.5" Read Intensive Drive

Warning: The interposer is part of the 2.5" drive and must be removed with it. Attempting to reuse an interposer can result in 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. Remove the adapter from the tray, then remove the three screws that hold the 2.5" drive and interposer in place, two from the side and one underneath the adapter. 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.
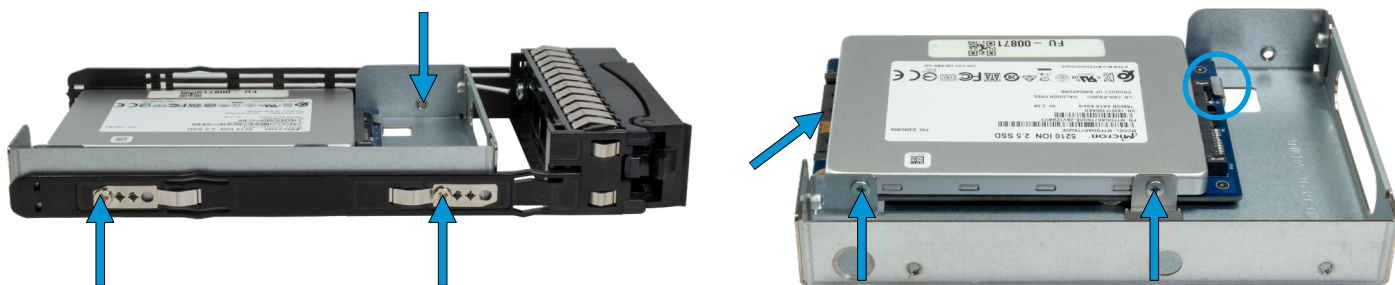
6 Connect Expansion Shelves

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 SAS connections, please adhere to the wiring example below. Connecting expansion shelves incorrectly causes errors. Never cable a single controller to different expanders on the same 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 to an ES24F.

7 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.

8 Connect Power Cords

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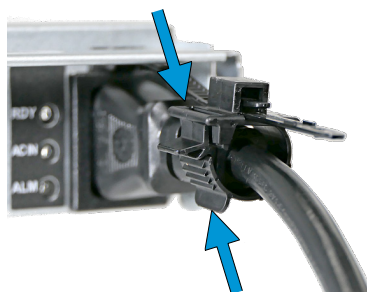
After connecting both power cords to the X-Series, plug them into power outlets. The system automatically turns on when connected to power. This design ensures that the X-Series powers back on after a power failure.

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

9 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.

10 Replace Controllers

Warning: To avoid the potential for data loss, you must contact iXsystems **before** replacing a controller or upgrading to High Availability. See section "15 Contacting iXsystems".

10.1 Remove Controllers

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.
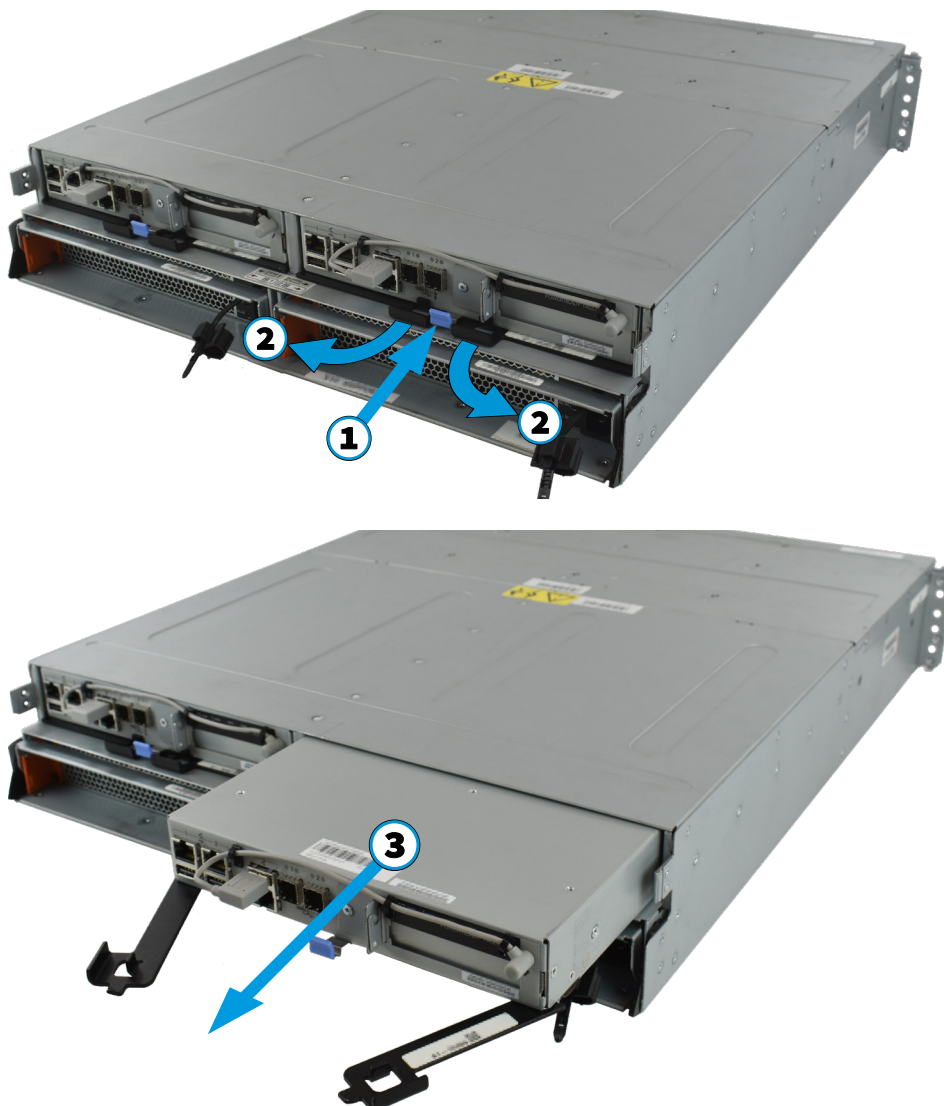
10.2 Remove Blanking Plates

If you purchased your X-Series with only one controller, you can upgrade it by adding a second controller. 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.
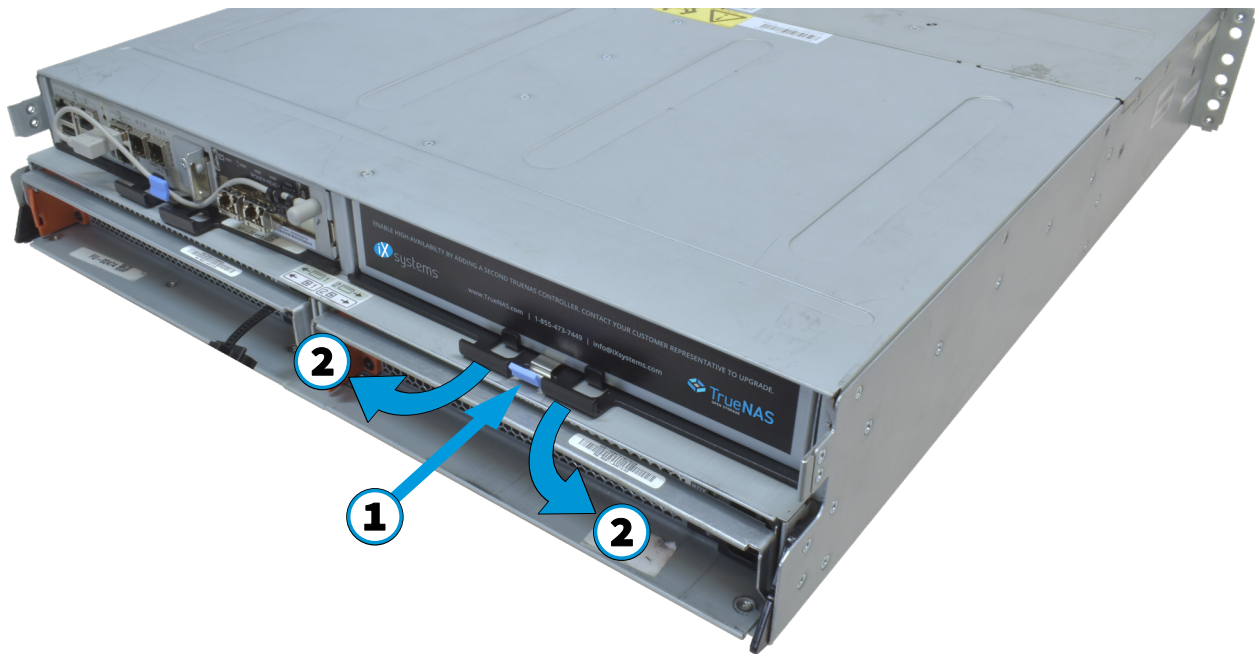
10.3 Install Controllers

Hold the controller by the sides and align with the opening on the chassis. Slide the controller into the chassis until it stops. Swing the locking levers inward until they snap into the blue clip on the bottom of the controller.

11 Log Into 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 af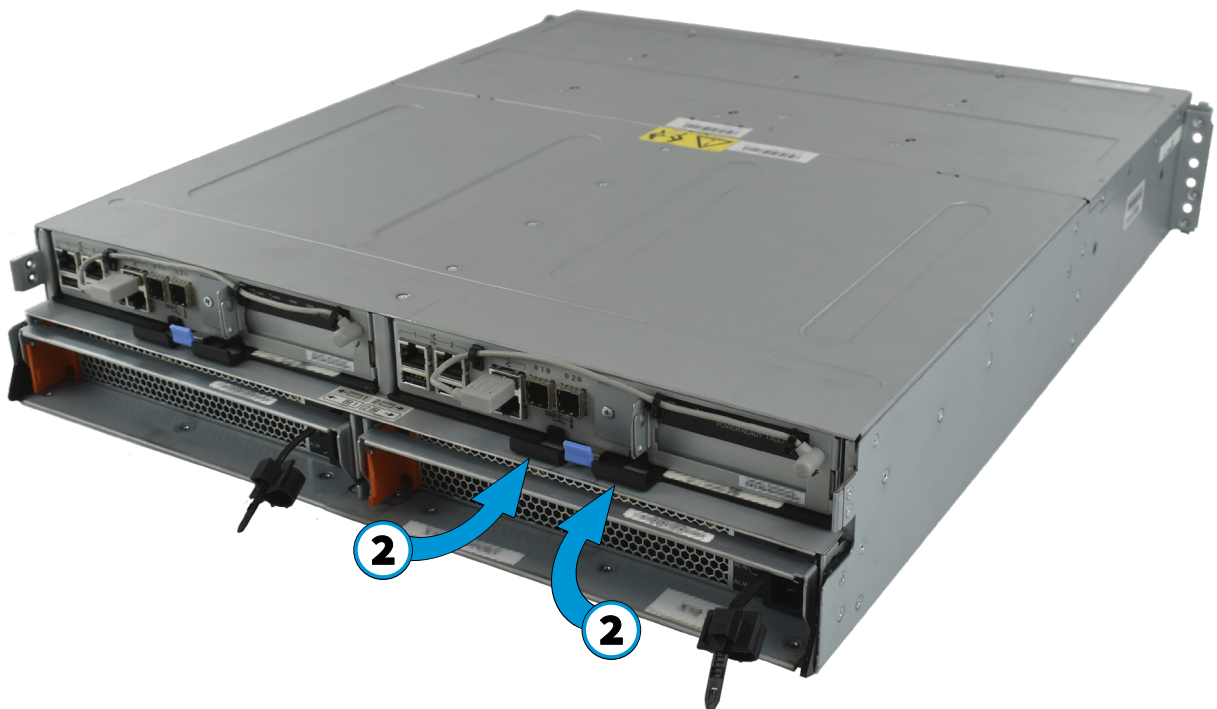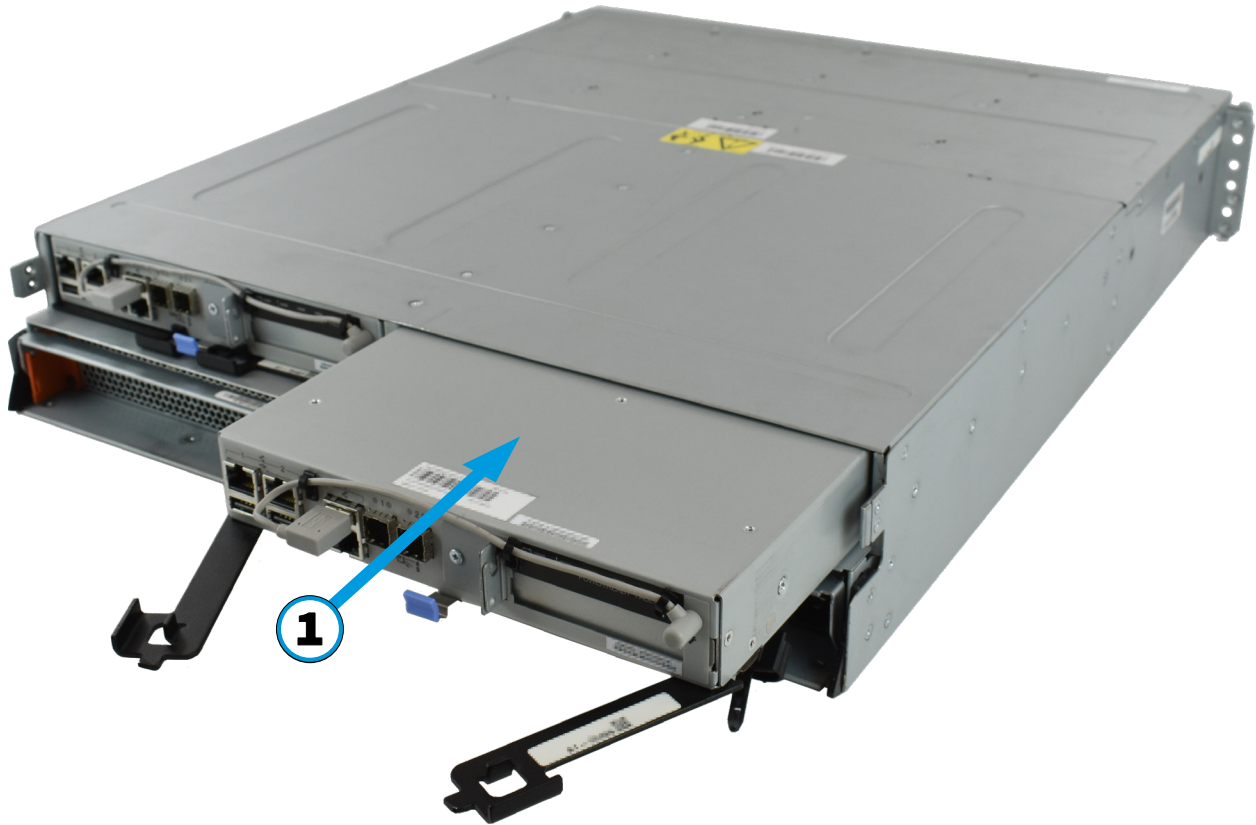ter powering on (see section "12 Connect Directly to the System Console"). Please contact iX Support if the TrueNAS web interface IP address was not provided with these documents or cannot be identified from the TrueNAS system console.

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*

12 Connect Directly 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.

We recommend that IPMI be on a separate and secure network without Internet access.
Please contact support if you need to upgrade your system's BIOS or 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 the console shows `ESM A =>` or `ESM B =>` , the X-Series is in SES mode.

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

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

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

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

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

13 Set Up 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 OOBM will not work if the cable is improperly connected.

13.1 Configure Remote Connections

Temporarily connect the included black USB serial cable to the 3.5mm port on the back of the TrueNAS controller.
Disconnect the black serial 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 unique to the X-Series system.
> Replace `{random}` strings in the examples with the randomized sticker password in your welcome letter.

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 **eth0** ipaddress address: `ipmitool -H eth0ipaddress -U admin bmc reset cold`

13.2 Configure Static IP Addresses

You can set the OOBM system 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
```

13.3 Configure 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 entering `exit`.

13.4 Establish Remote Connections

You must connect the X-Series Out-of-Band networking port to the local network using a shielded RJ45 cable.

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
```

Serial Over LAN (SOL) on another session displays when a connection is already active. To reset the SOL system from the remote computer, enter the command below with the unique randomized password:

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

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, then enter `~`.

14 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/

15 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)

Notes: