



TrueNAS R-Series Unified Storage Arrays Installation Guide

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TrueNAS® R-Series Unified Storage Arrays Basic Setup Guide Version 1.01



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Introducing the TrueNAS R-Series

TrueNAS R-Series systems are a variety of hard disk, hybrid, and all-flash storage arrays available in 1U, 2U, and 4U configurations. R-Series systems have the latest version of TrueNAS CORE preloaded. You will receive the system and all installation components carefully packed and ready for installation. The packed system and components vary by what was purchased.

Take a moment to review the safety considerations and hardware requirements before installing an R-Series system into a rack.

1.1 Safety

R-Series systems are sensitive electronic devices. Be sure to take full safety precautions when installing or servicing a system.

1.1.1 Static Discharge

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

1. Turn off the system and remove the power cable before opening the system case or touching any internal components.
2. 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.
3. Touch the metal chassis with your bare hand before touching any internal component, including components not yet installed in the system. This redirects static electricity in your body away from the sensitive internal components. Using an anti-static wristband and grounding cable is another option.
4. Store all system components in anti-static bags.

More details about ESD and preventative tips can be found at <https://www.wikihow.com/Ground-Yourself-to-Avoid-Destroying-a-Computer-with-Electrostatic-Discharge>.

1.1.2 Handling the System

Two people are recommended to lift an R-Series system.

Do not attempt to lift an R-Series system when it is fully populated with drives! It is recommended to install the system in a rack before adding drives and then removing the drives before de-racking an R-Series 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.

These instructions use “left” and “right” according to your perspective when facing the front of a system or rack.

1.2 Requirements

It is recommended to have these tools available when installing an R-Series system in a rack:

- #2 Philips head screwdriver
- Flathead screwdriver
- Tape measure
- Level

R10

The R10 is a 1U All-Flash Storage Array that has 16 SSD drive bays, redundant power supplies, and a single TrueNAS controller. You will find these items when opening the R10 packaging:

2.1 R10 Components



R10 All-Flash Storage Array



Set of rackmount rails and mounting hardware



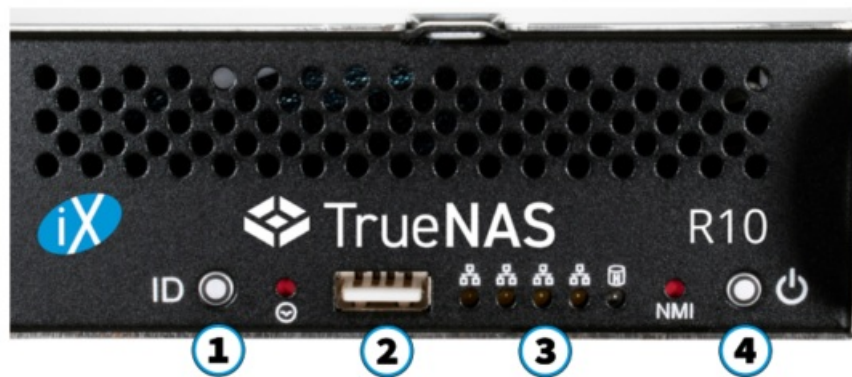
16 SSD drive trays with up to 16 drives installed



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

2.2 Ports and Indicators

The right side of the R10 front panel has buttons, ports, and indicators for controlling the system.



There are lighted buttons for system ID (1) and power (4). There is also a USB 2.0 port (2) and lights for network and controller activity (3).

The back panel has the power supplies and connection ports:



1. Power supplies #1 and #2
2. Serial port
3. 1Gb Ethernet Out of Band Management port and two USB 2.0 ports
4. Two USB 3.0 ports
5. Two 10Gb SFP+ networking ports
6. VGA monitor port

R20

The R20 is a 2U Hybrid Storage Array that has 12 3.5" drive bays and 2 SSD drive bays, redundant power supplies, and a single TrueNAS controller. You will find these items when opening the R20 packaging:

3.1 R20 Components



R20 Hybrid Storage Array



Locking Bezel



Set of rackmount rails with mounting hardware



12 3.5" drive trays with up to 12 hard drives installed



2 SSD drive trays with up to 2 SSDs installed



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

3.2 Ports and Indicators

R20 buttons and indicators are located on the “ears” on the right and left edge of the system front.



The left ear has lighted buttons for power (1) and system ID (2). There are also fault (3) and network activity (4) indicators. Both ears have hinged covers over screw holes for securing the system to a rack (5). The right ear has a single USB 3.0 port (6).

The fault indicator is on during the initial power-on self-test (POST) and off during normal operation. It also turns on if the TrueNAS software issues an alert. For details about software alerts and how to configure them, see “Configuring Alerts” in the TrueNAS Documentation Hub (<https://www.truenas.com/docs/>).

The back panel has the power supplies and connection ports:



1. Power supplies #1 and #2
2. Serial port
3. 1Gb Ethernet Out of Band Management port and two USB 2.0 ports
4. Two USB 3.0 ports
5. Two 10Gb SFP+ networking ports
6. VGA monitor port
7. SSD Drive Bays

R40

The R40 is a 2U All-Flash Storage Array that has 48 SSD drive bays, redundant power supplies, and a single TrueNAS controller. You will find these items when opening the R40 packaging:

4.1 R40 Components



R40 All-Flash Storage Array



Locking Bezel



Set of rackmount rails with mounting hardware



48 SSD drive trays with up to 48 drives installed



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

4.2 Ports and Indicators

Buttons and indicators are on the front ears of the R40:



The left ear has lighted buttons for power (1) and system ID (2). There are also fault (3) and network activity (4) indicators. Both ears have hinged covers over screw holes for securing the system to a rack (5). The right ear has

a single USB 3.0 port (6).

The fault indicator is on during the initial power-on self-test (POST) and off during normal operation. It also turns on if the TrueNAS software issues an alert. For details about software alerts and how to configure them, see “Configuring Alerts” in the TrueNAS Documentation Hub (<https://www.truenas.com/docs/hub/>)

The back panel has the power supplies and connection ports:



1. Power supplies #1 and #2
2. Serial port
3. 1Gb Ethernet Out of Band Management port and two USB 2.0 ports
4. Two USB 3.0 ports
5. Two 10Gb SFP+ networking ports
6. VGA monitor port

Racking the R10, R20, or R40

The R10, R20, and R40 share the same rail kit and racking process. Because each system has slightly different dimensions, it is recommended to double-check the rack rail placement for the purchased system.

Drives should only be installed in a system after it has been placed in the rack. It is also recommended to remove all installed drives **before** unranking a system.

Always team-lift a system when installing to a rack.

5.1 Rack Requirements

The R10, R20, or R40 require an EIA-310 compliant rack. To properly install the rack rails, the front and rear vertical rack posts need to be spaced between 23" – 35.75" (584mm-908mm) apart.

5.2 Attach the Chassis Rails

Each rail has two components, the outer rack rail, and the inner chassis rail. To protect it during shipping, the chassis rail is inserted into the rack rail and must be removed before attaching it to a system. Slide the chassis rail forward until the metal catch stops it in place. Push in the catch and continue to slide the chassis rail forward until it is free of the rack rail.



Take the chassis rail and align the end stamped “FRONT” with the front of the system. Fit the rail keyholes over the mounting pegs on the side of the system and slide it into place. Use one of the included short M4 screws to secure the rail to the system.

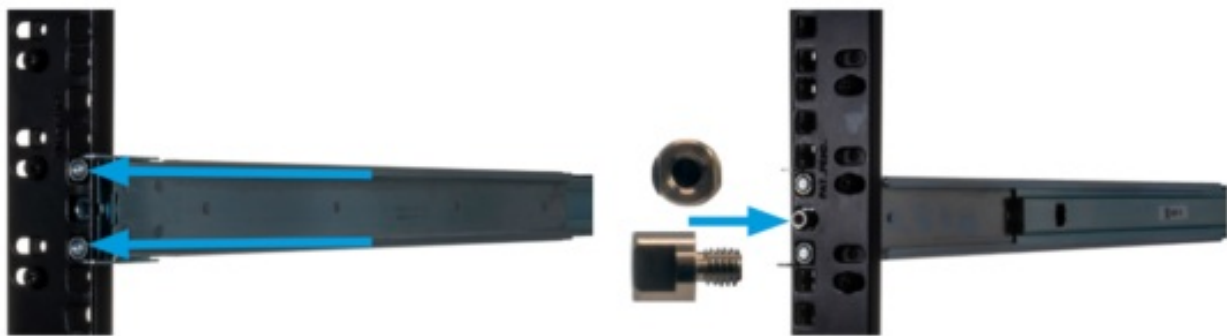


The image shows attaching the rail to an R20, but the R10 and R40 follow the same procedure. For the R20 and R40, use the screw hole at the back of the chassis for securing the rail. Follow this procedure to slide out and attach the second chassis rail to the other side of the system.

5.3 Install the Rack Rails

Before installing the rack rail, make sure the rack has enough space for the system. The R10 needs 1U of space for both the system and rack rails. The R20 and R40 need 2U of rack space, with the rack rails installed into the bottom 1U.

Take a rack rail and align the end stamped "FRONT" with the front of the rack. The "FRONT" text must be pointed inside the rack so the chassis rails can slide into the rack rails. Align the rail front pegs with the rack attach points and push the rail into the attach points. Fit the rail retention clip over the front of the rack by pushing on the spring plate to open the clip. The rail kit also includes two retention screw hole extenders that can be screwed into the middle rail attach point.

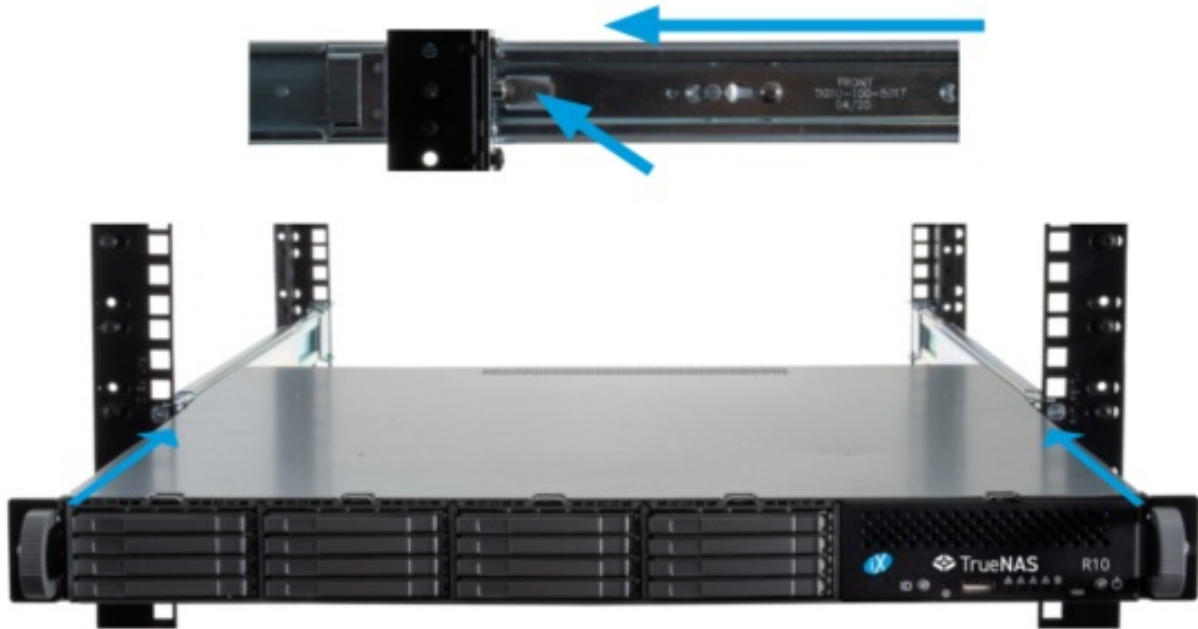


With the front of the rail installed, extend the back of the rack rail towards the equivalent attaches points on the rear rack post. Make sure the rail remains level from front to back. Follow this process to install the other rack rail.



5.4 Push the System into the Rack

Team-lift the system and align the chassis rails with the rack rails. Slide the ends of the chassis rails into the rack rails and push the system forward until the metal safety catches click into place. Squeeze the safety catches against the sides of the system and continue to push the system forward until it is flush with the front of the rack. Team-lift the system and align the chassis rails with the rack rails. Slide the ends of the chassis rails into the rack rails and push the system forward until the metal safety catches click into place. Squeeze the safety catches against the sides of the system and continue to push the system forward until it is flush with the front of the rack.



The rail kit includes additional M5 screws that can be used to secure the system to the rack rails.

Handling Drive Trays

R-Series systems share many of the same drive trays. The general drive installation and tray insertion procedures for each type of drive tray are described in this chapter.

6.1 SSD Drive Trays (R10, R20, R40)

To replace a drive, unlatch (1) and rotate the plastic clip (2) on the tool-less tray to release the drive. Slide the drive out of the tray (3).



To add a drive to the tray, follow the same procedure to unlatch and rotate the plastic clip out of the way, then slide the drive forward under the metal tabs and rotate the clip back until it snaps into place. Make sure the drive connectors are accessible at the back of the tray.

To install an SSD drive tray into a system, align the tray with an opening on the chassis and slide it forward until the locking arm begins to swing closed. Gently swing the locking arm forward until it latches into place.

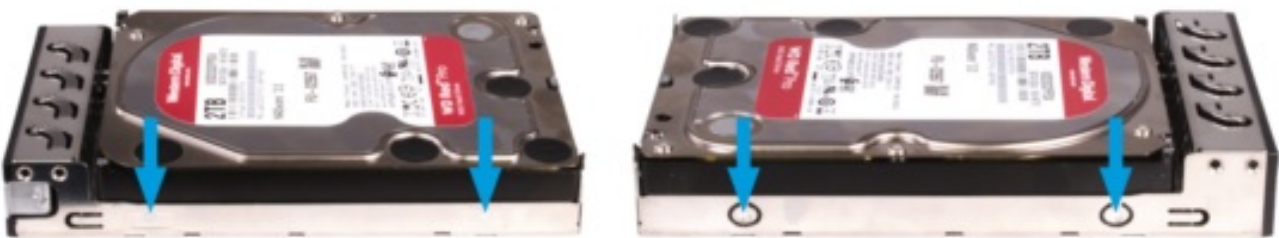


To remove a drive tray, push the button on the right end of the tray to release the tray locking arm. Gently swing the arm until it stops, then pull the tray out from the system.



6.2 Hard Drive Trays (R20)

No tools are required to install a drive in a full-size hard drive tray. Make sure the drive connectors are pointed out at the back of the tray and push the drive side screw holes into the fixed retention pegs on one side of the tray. Continue to push the other side of the drive down into the flexible retention pegs to secure the drive in place.



To remove a drive, push out the side attached to the flexible retention pegs from the bottom of the tray, then lift the drive free.

To install a hard drive tray into a system, push the tray into a slot until the locking arm begins to swing closed. Gently push the arm into place to seat the tray and secure it in the system.

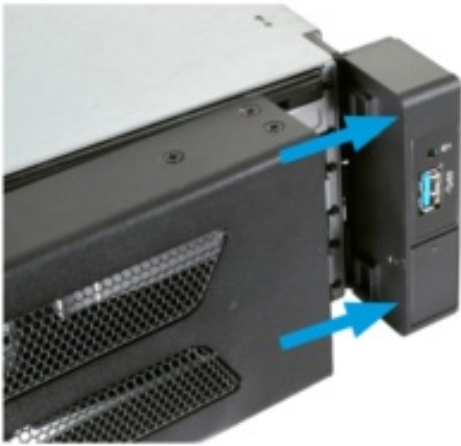


To remove a hard drive tray, press the locking arm release at the right side of the tray front. Swing the arm out until it completely stops, then pull the tray free from the system.

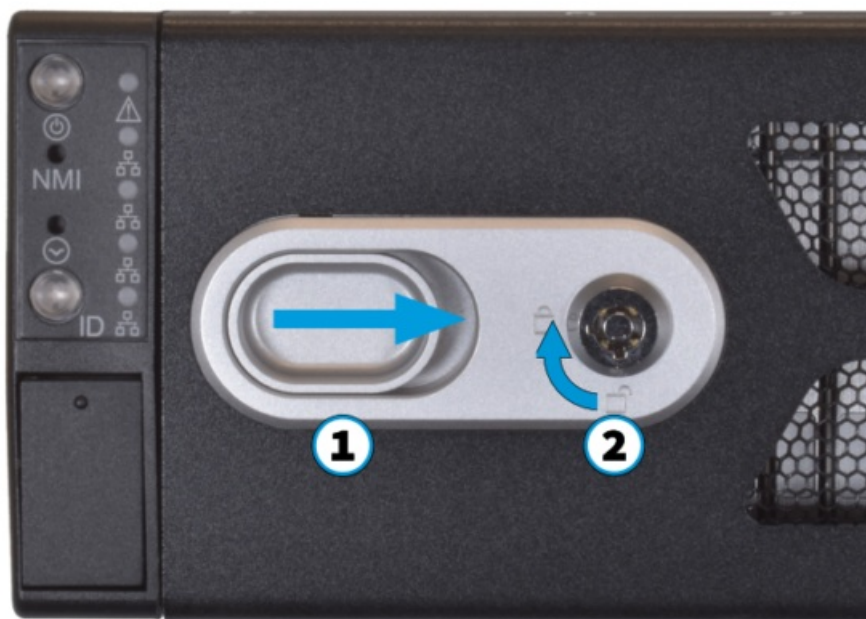


Bezel

The R20 and R40 include an optional bezel that can be locked to prevent unauthorized access to the primary drive trays. To attach the locking bezel, align the right side of the bezel with the attach points on the right ear and push the left side of the bezel into the attach points on the left ear until it clicks into place.



Removing the bezel requires sliding the front latch to the right and pulling the bezel forward **(1)**. To lock the bezel in place, insert the key and rotate the lock to the left **(2)**.



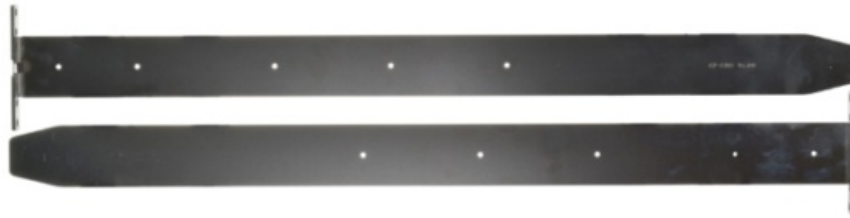
R50

The R50 is a 4U Hybrid Storage Array that has 48 3.5" and three 2.5" NVMe drive bays, redundant power supplies, and a single TrueNAS controller. You will find these items when opening the R50 packaging:

8.1 R50 Components



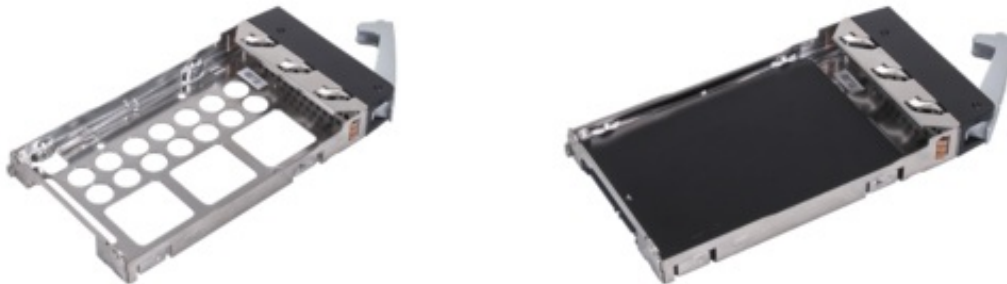
R50 Hybrid Storage Array



Set of fixed rackmount rails



Up to 48 hard drives, depending on the purchase (shipped separately)



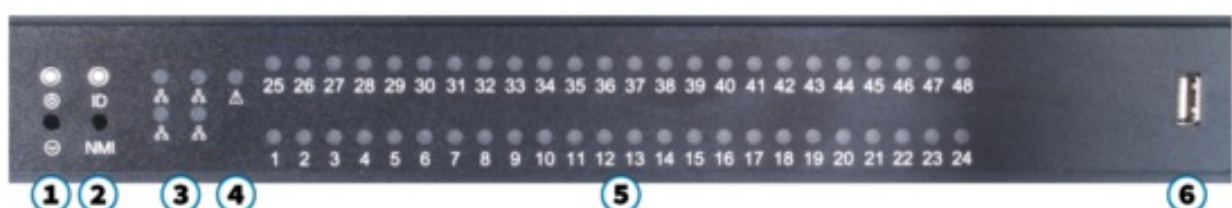
3 NVMe drive trays with up to 3 drives installed



Accessory kit with 2 IEC C13 to NEMA 5-15P power cords, 2 IEC C13 to C14 cords, a set of velcro cable ties, and bags with installation hardware

8.2 Ports and Indicators

The lower section of the front panel has buttons and indicators to help control the system:



There are lighted buttons for power (1) and system ID (2). There is also network activity (3), fault (4), and disk

status indicators (5). The right side has a single USB 2.0 port (6).

The fault indicator is on during the initial power-on self-test (POST) and off during normal operation. It also turns on if the TrueNAS® software issues an alert. For details about software alerts and how to configure them, see “Configuring Alerts” in the TrueNAS Documentation Hub (<https://www.truenas.com/docs/hub/>) The back panel has the NVMe drive bay, case fans, power supplies, and connection ports:



1. NVMe drive bay fan and status indicators
2. Power Supplies #1 and #2
3. System fans
4. Serial port
5. 1Gb Ethernet Out of Band Management port and two USB 2.0 ports
6. Two USB 3.0 ports
7. Two 10Gb SFP+ networking ports
8. VGA monitor port

8.3 Racking the R50

The R50 has a built-in rail system that provides access to the main drive bay. Racking an R50 requires 4U of rack space. Install cage nuts in the rack posts where the rails and front of the R50 will be secured to the rack, attach the included rack rails, then push the R50 into the rails and secure the front of the system to the rack.

Two people are required to mount the R50 in a rack. It is recommended to install drives after securing the system in the rack.

8.3.1 Rack Requirements

The R50 requires an EIA-310 compliant rack. The front and rear vertical rack posts can be spaced up to four inches (101.6mm) apart in three different depth configurations: 28"-32" (711.2-812.8mm), 31"-35" (787.4-889 mm), or 34"-38" (863.6-965.2 mm).

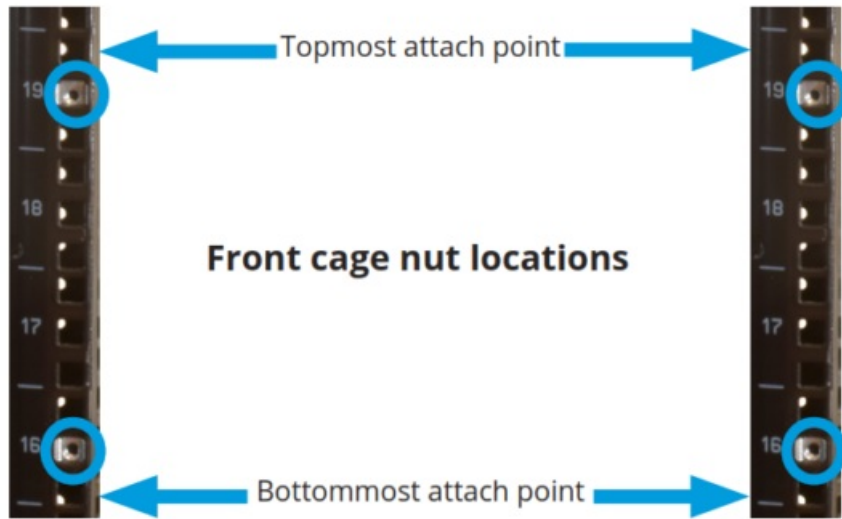
8.3.2 Place Cage Nuts

Cage nuts are attached to holes in the rack posts, with the nut on the inside of the rack and “wings” pointed horizontally.

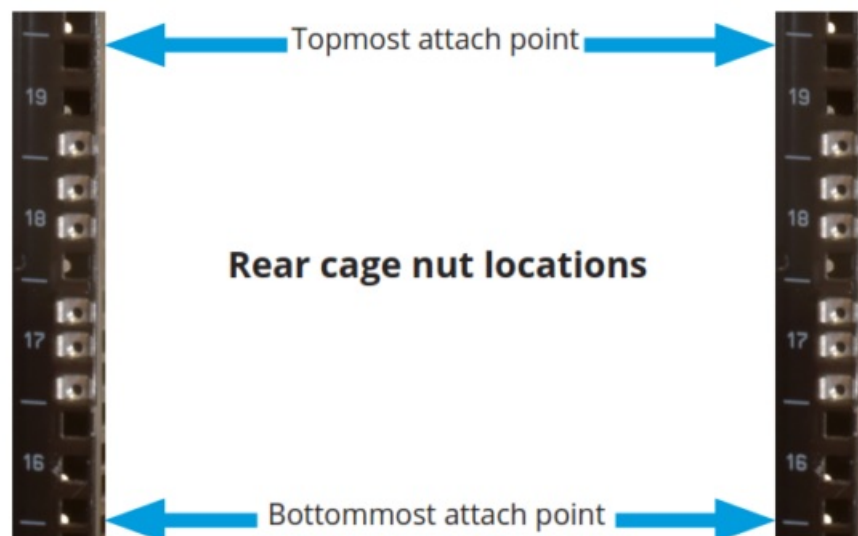
Attach four cage nuts in the rack front posts, two on each side. The top cage nut is placed one attach point down from the topmost point of the reserved 4U of rack space.

The bottom cage nut is placed one attach point up from the bottommost point of the reserved 4U of rack space.

The remaining two cage nuts are placed in the same locations on the other front rack post.



You will need six cage nuts for each rear rack rail (**twelve total**). Starting from the **topmost** attach point of the 4U of reserved rack space, skip the first two attach points and attach cage nuts to the next three descending attach points. **Skip one attach point**, then attach the final three cage nuts to the **next three descending attach points**. Attach another six cage nuts to the same attach points on the other rear rack rail.



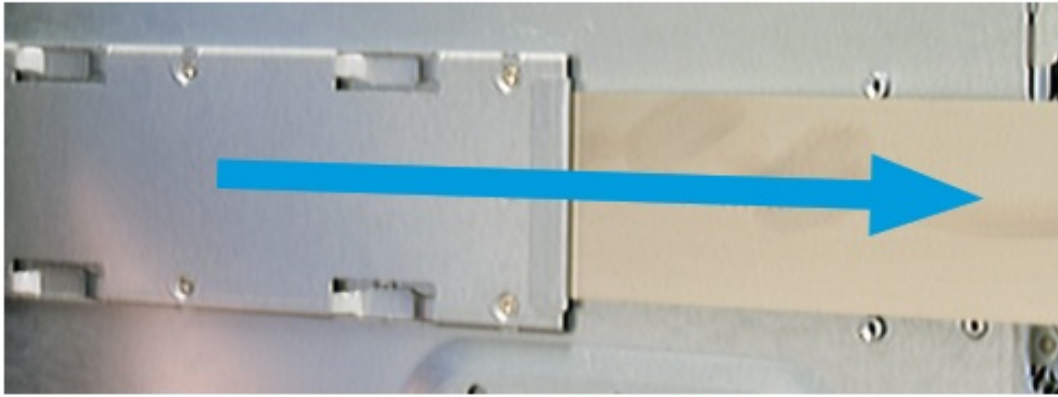
8.3.3 Install the Rack Rails

At the rear of the rack, fit one of the rails over the installed cage nuts. The rail alignment tab will fit into the empty rack space between the cage nuts. Use the included M5 screws to attach the rail to the cage nuts. Follow this process for the other rail.



8.3.4 Mount the R50 in the Rack

Two people at a minimum should lift the R50. Align the grooves on the sides of the system with the rails and slide the system forward until it is flush with the front of the rack.



Use four M5 screws to secure the system to the rack.



8.4 Managing Drives

The R50 primary drive bay is mounted on internal rails and slides out from the system. The NVMe drive bay is accessed by removing the NVMe fan on the rear of the system. Hard drives are installed directly into the system without any additional drive trays. NVMe drives use detachable trays to mount and secure the drive in the system.

8.4.1 Handling the Primary Drive Bay

To secure the drive bay and prevent it from accidentally opening, tighten the captive thumbscrews on the front of the system (1). The included key can also lock the drive bay and prevent unauthorized access (2).



Open the drive bay by unlocking the front (1), loosening the captive thumbscrews (2), and using the handles (3) to pull the bay forward.



To insert the drive bay back into the system, slide the blue release catches on each rail and push the bay forward.

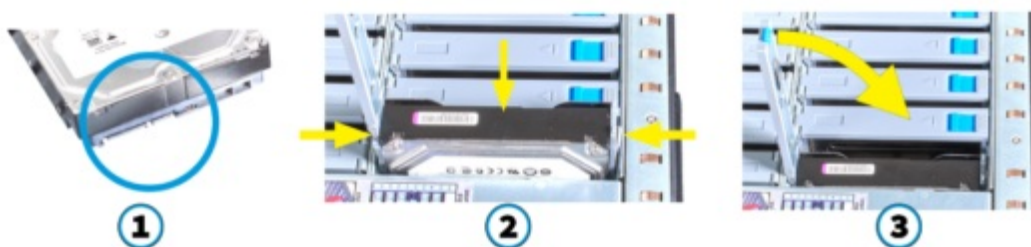


8.4.2 Installing Hard Drives

The R50 allows inserting hard drives directly into the system without requiring additional installation into a detachable tray. To install a hard drive, open the drive bay to expose the drive slot covers. Slide the blue release tab (1) on a slot cover and lift (2). Gently grasp the inner tray and slide it up until it clicks into place (3).



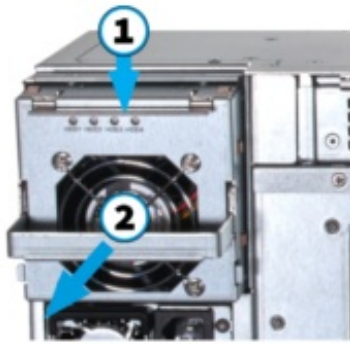
Take the hard drive and align the connectors facing downwards into the system. The power and SATA connectors are typically aligned to the left side of the tray (1). Slide the drive into the tray, push in the plastic release tabs on each side of the tray and push the tray downwards to install the drive into the system (2). Close the slot cover and make sure it clicks into place (3).



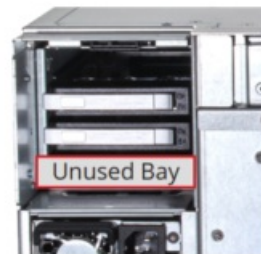
8.4.3 Accessing the NVMe Drive Bays

R50 NVMe drive bays are located behind a case fan on the back of the system. To remove the fan, rotate the

handle downward, push down on the retention tab (1), and pull the fan free of the system (2).



To remove a drive tray, push the release catch on the left side of the tray front, then swing the retention arm out until it fully stops. Gently pull the tray forward until it is completely free from the system. The bottommost drive basis is not used in the R50.



8.4.4 Replacing NVMe Drives

To remove a drive from an NVMe tray, push on the drive from the bottom of the tray until the drive pops out of the side retention pegs on the drive tray.

To install a new drive in an NVMe tray, align the drive connectors with the back of the tray. Push the screw holes on the side of the drive into the fixed pegs on the tray, then push the drive down over the flexible pegs until the drive clicks into place.

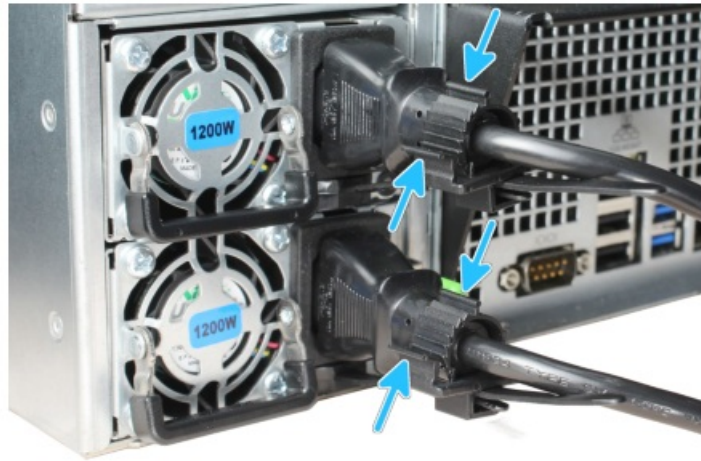


Cabling and R-Series System

When the system has been racked and all drives installed, the R-Series is ready to have cables attached and be powered on. Refer to the earlier back panel descriptions for each R-Series system in this Guide for port identification.

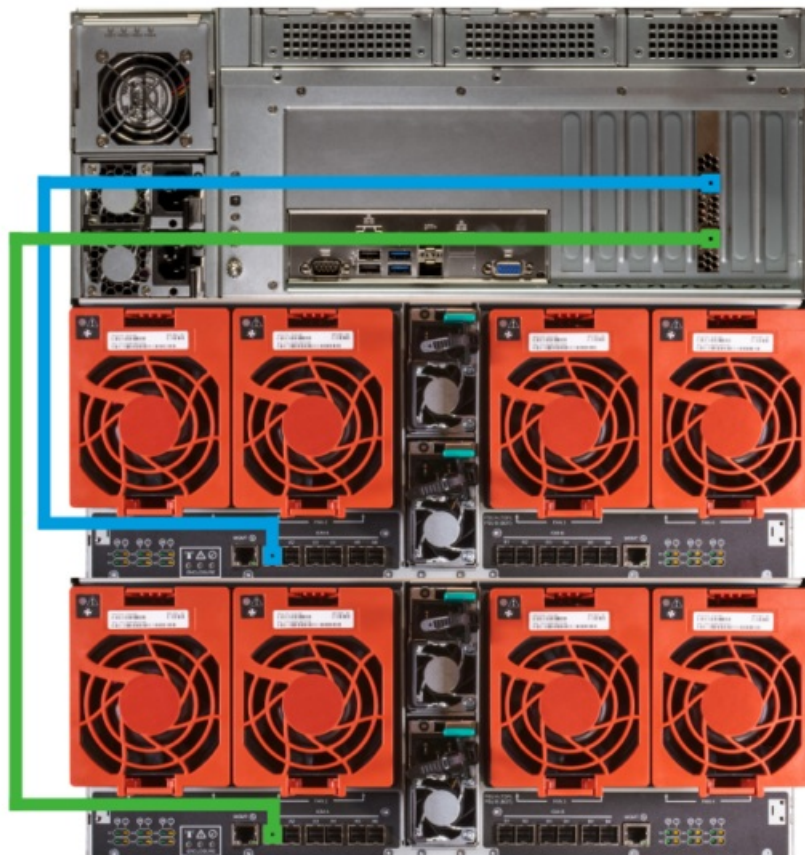
It is recommended to connect the Out of Band Management port and a monitor and keyboard for the first boot so that the system BIOS can be configured to your specific needs and the initial TrueNAS web interface IP address can be viewed.

When all other ports are connected, finish by plugging in both power cables. Each system has a retention clip that can be used to prevent accidental unplugging of the system.



9.1 R50 SAS Connections

When purchased with a SAS expansion card, the R50 can connect to two Expansion Shelves. This diagram shows connecting an R50 to two systems ES102s:



Connecting to the TrueNAS Web Interface

Powering on the system and allowing it to boot to the system console will display the IP address of the TrueNAS R-Series graphical web interface, 192.168.100.231 in this example:

The web user interface is at: <http://192.168.100.231>

Enter the IP address into a browser on a computer on the same network to access the web user interface. Log in using the default credentials:

- Username: **root**
- Password: **abcd1234**

Documentation

The TrueNAS Documentation Hub provides numerous articles designed to help you configure and use the

software.

It is available by clicking Guide in the TrueNAS web interface or going directly to

<https://www.truenas.com/docs/hub/>.


The TrueNAS Documentation Hub also provides an online version of this Guide and documentation of other systems products at <https://www.truenas.com/docs/hardware/>.

Contacting iXsystems

For assistance, please contact iX Support:

Contact Method	Contact Options
Web	https://support.ixsystems.com
Email	si ipportc@iXsystPms.com
Telephone	Monday-Friday, 6:00AM to 6:00PM Pacific Standard Time: <ul style="list-style-type: none">• US-only toll-free: 855-473-7449 option 2• Local and international: 408-943-4100 option 2
Telephone	Telephone After Hours (24x7 Gold Level Support only): <ul style="list-style-type: none">• US-only toll-free: 855-499-5131• International: 408-878-3140 (International calling rates will apply)

Documents / Resources

	TrueNAS R-Series Unified Storage Arrays [pdf] Installation Guide R-Series Unified Storage Arrays, R-Series, Unified Storage Arrays
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References

- support.ixsystems.com
- truenas.com/docs/
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