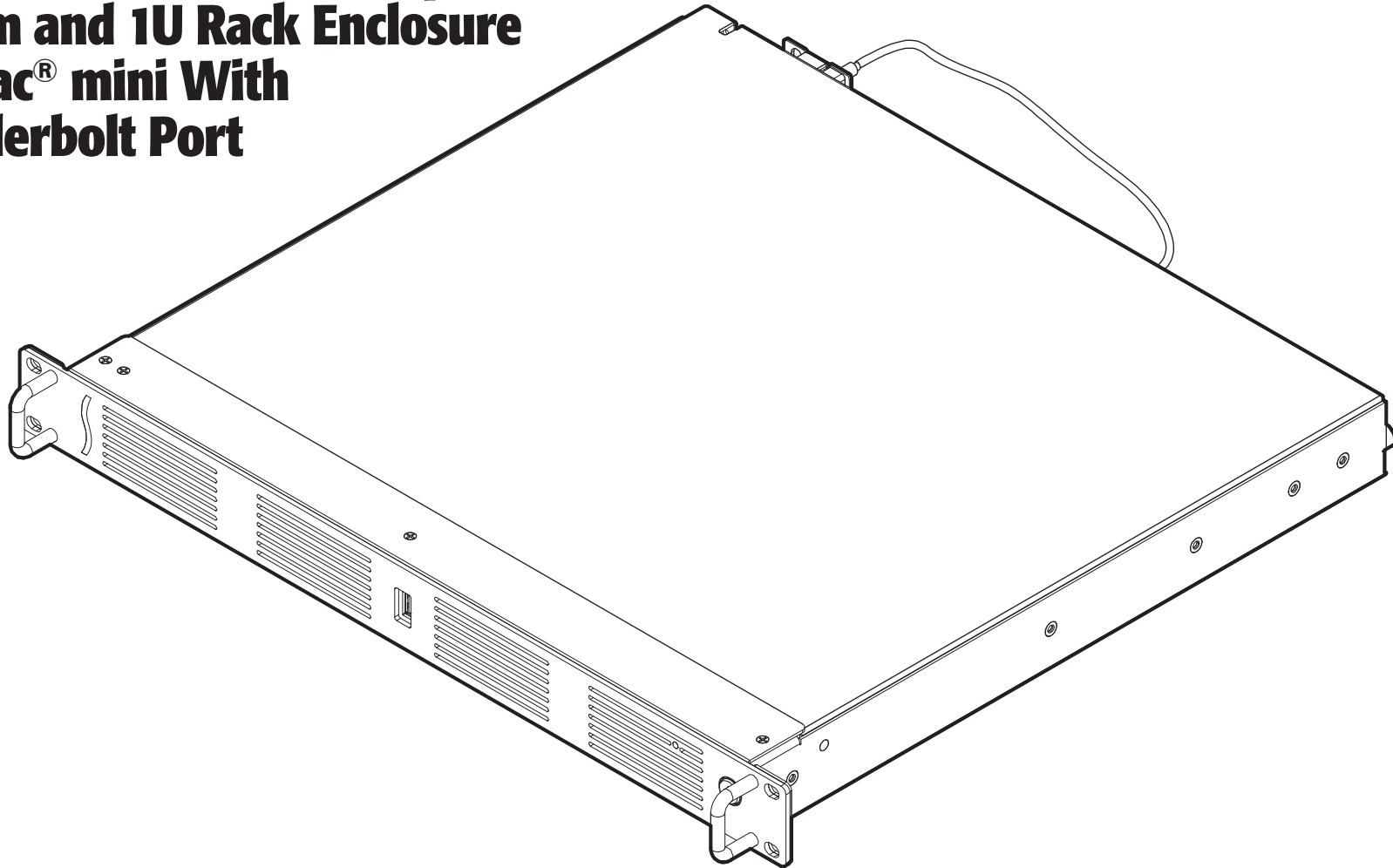


User's Guide

for xMac™ mini Server
Thunderbolt™-to-PCI® Expansion
System and 1U Rack Enclosure
for Mac® mini With
Thunderbolt Port



Creativity Stored Here™

Contents

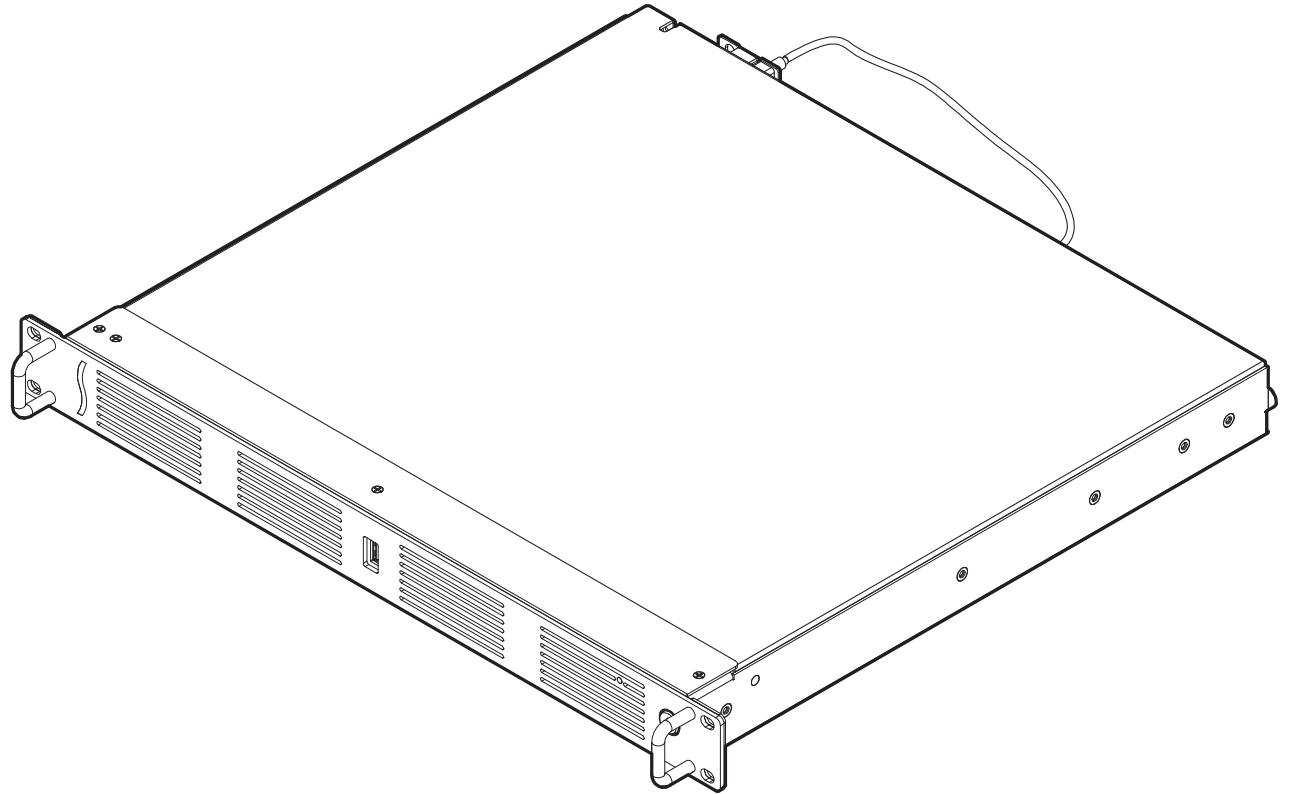
1	Introduction and Package Contents.....	1
	Introduction	
	Package Contents	
2	xMac mini Server Description.....	2
3	PCIe Cards, Computer, and xMac mini Server Installation Steps.....	4
	A – PCIe Cards Installation Steps	
	B – Mac mini Installation Steps	
	C – xMac mini Server Rackmount Installation Information	
4	Verify Connections Using System Information.....	11
	A – Verify xMac mini Server is Recognized	
	B – Verify Installed Cards are Recognized	
5	Tips and Known Issues.....	12
	Tips	
	Known Issues	
6	Specifications, Precautions, FCC Compliance, and Support Information.....	13
	Specifications	
	Safety Precautions	
	FCC Compliance	
	Contacting Customer Service	
	Visit Our Website	

Chapter 1 – Introduction and Package Contents

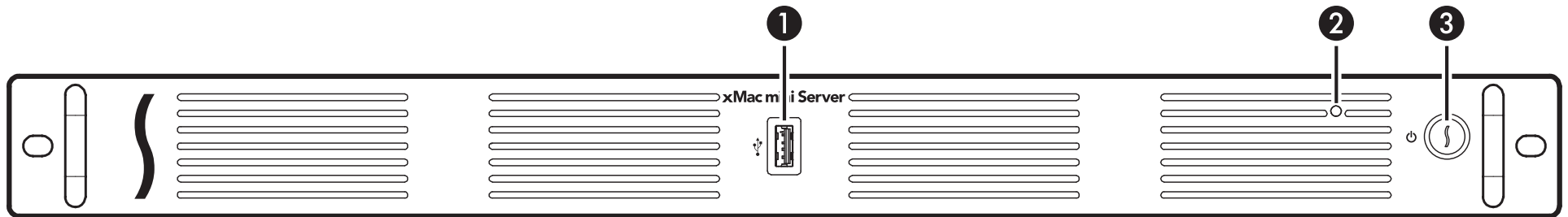
Congratulations on your purchase! xMac mini Server is a PCIe 2.0 expansion system and 1U rackmount enclosure for Mac minis with a Thunderbolt port. Through its two PCIe slots, you may connect two expansion cards to your Mac mini to expand its capabilities in ways never before possible!

xMac mini Server has numerous thoughtful design touches. The power supply and fans are user-replaceable. The front panel USB port connects to the back of the Mac mini, enabling you to connect a keyboard, mouse, or thumb drive to the computer without having to access its ports from the back. Other Mac mini interface ports are extended to the back of the chassis and mounted on the rear panel for convenient interfacing of Gigabit Ethernet, USB, and HDMI cables. The xMac mini Server's power switch turns the computer on and off, and the PCIe slots are powered on/off with the Mac mini for maximum energy savings. An opening in the front panel allows the Mac mini's power indicator to shine through. There's a central power hub for the computer and power supply for the PCIe slots, enabling you to power everything with one power cord. A locking bracket for the Thunderbolt cables and holes for cable ties enable you to secure all cables, keeping them tidy while avoiding accidental disconnects.

While xMac mini Server requires no drivers, the expansion cards you install do; Thunderbolt-compatible drivers to enable them to work properly through the Thunderbolt interface are required. More information on which cards are compatible with xMac mini Server is available at <http://sonnettech.com/support/charts/thunderbolt/index.html>



Chapter 2 – xMac mini Server Description



1 – USB 3.0 Port

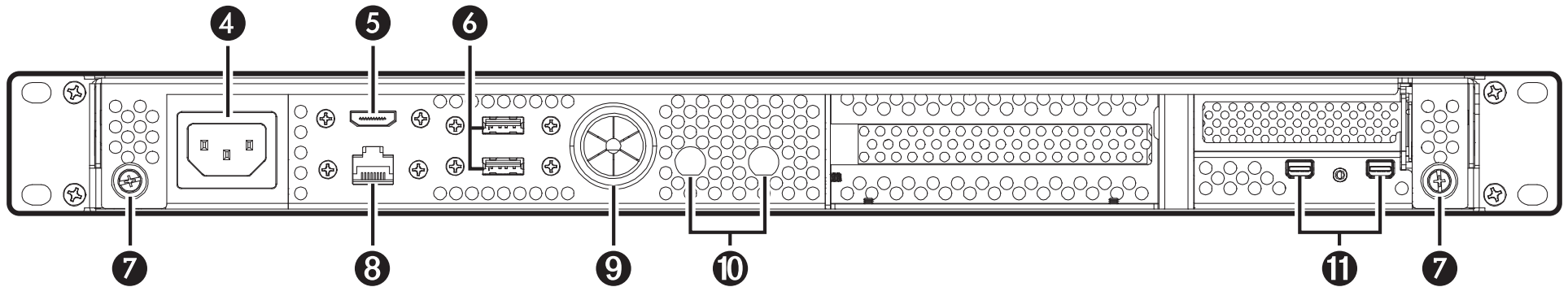
This port connects to the Mac mini through a cable attached to the front panel

2 – Power Indicator Opening

This hole allows the Mac mini's power indicator to shine through

3 – Power Switch

This button activates the Mac mini's power switch; xMac mini's PCIe slots' power supply turns on and off along with the computer



4 – Power Input Socket

Connect the included AC power cable here

5 – HDMI Port

This port connects to the Mac mini through a cable attached to the back panel

6 – USB 3.0 Ports

These ports connect to the Mac mini through cables attached to the back panel

7 – Top Panel Thumbscrews

Loosen these captive screws to enable the removal of the top cover, tighten the screws to secure the top cover

8 – Gigabit Ethernet Port

This RJ-45 port connects to the Mac mini through a cable attached to the back panel

9 – External Cable Passthrough

This opening allows the connection of the included Thunderbolt cable from the computer to the left Thunderbolt port on the xMac mini Server's back panel, and the connection of other cables to the Mac mini's ports or user-installed PCIe cards

10 – BNC Connector Mounting Holes

These holes accommodate the installation of BNC connectors like those used for HD/SDI output for the RED ROCKET transcoding card

11 – Thunderbolt Ports

The left port is connected to the Mac mini's Thunderbolt port, the other may be used to connect another Thunderbolt device

Chapter 2 – xMac mini Server Description

1 – PCIe Slot 1

This slot accepts up to an x16 mechanical, full-length, full-height, single-width PCIe 2.0 card, and is also compatible with PCIe 1.1 cards

2 – PCIe Card Guide

When installing full-length card, use this guide to support and secure the card

3 – Power Hub

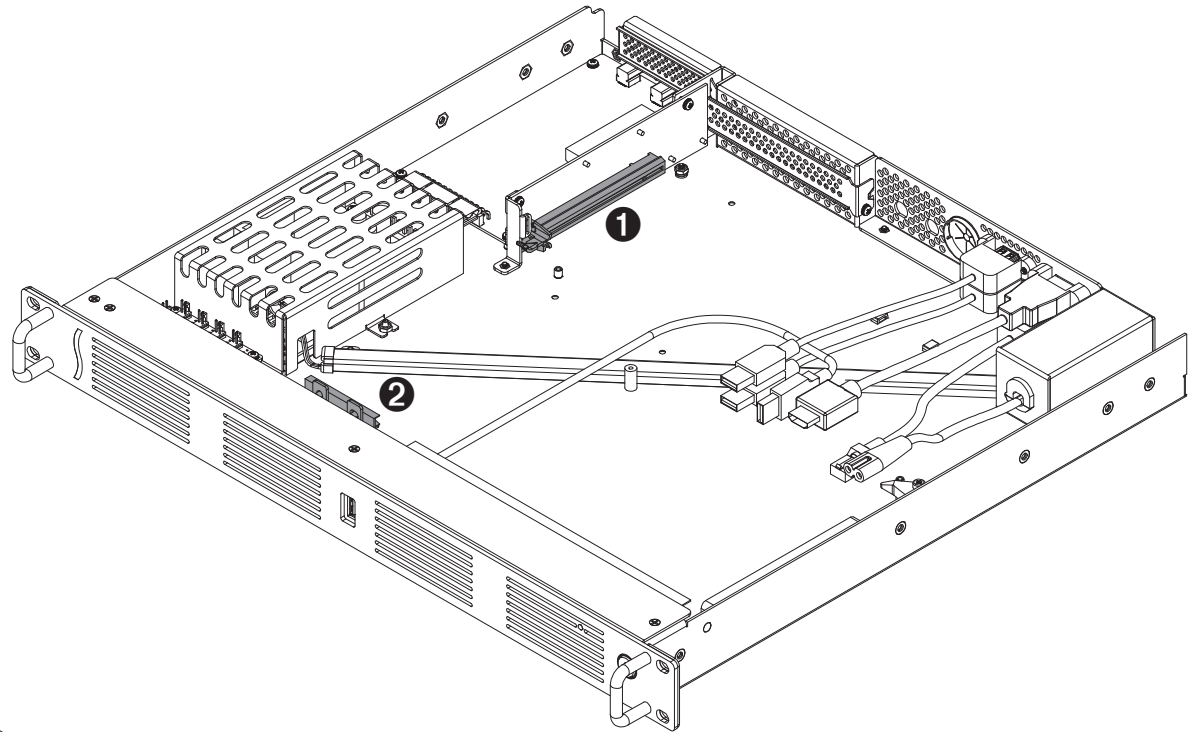
This hub routes power to the Mac mini and to the xMac mini Server's power supply

4 – PCIe Slot 2

This slot accepts an x8 mechanical, half-length, low-profile PCIe 2.0 card, and is also compatible with PCIe 1.1 cards. Note that the use of a low-profile bracket on the card installed in this slot is required

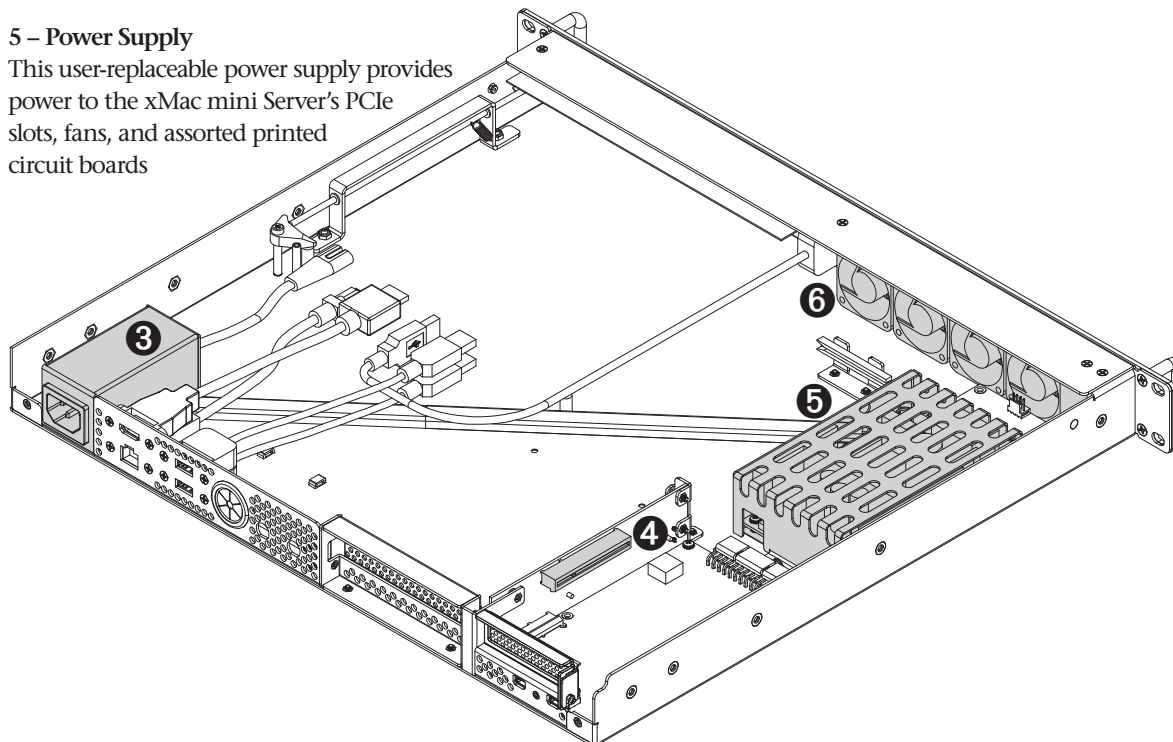
5 – Power Supply

This user-replaceable power supply provides power to the xMac mini Server's PCIe slots, fans, and assorted printed circuit boards



6 – Fan Assembly

This user-replaceable part provides airflow to cool the Mac mini, installed PCIe cards, and other components inside the enclosure



A – Thunderbolt Connector Lock

This lock secures Thunderbolt connectors when plugged into the xMac mini Server's Thunderbolt ports to prevent accidental disconnection

B – Daughter Card Mounting Bracket and Screws

This bracket secures a daughter card, like the I/O card included with RME's HDSPe MADI FX, inside the xMac mini Server



Chapter 3 – Computer, PCIe Cards, and xMac mini Server Installation Steps

A – PCIe Cards Installation Steps



Support Note: In order to install a PCIe card into slot 1, you will need a short-handled Phillips screwdriver. In order to install a card into slot 2, you will need either a standard 3/16" wrench, or a small adjustable Crescent® wrench.

1. Remove the xMac mini Server from its packaging, and then set it on a flat, level surface.
2. Loosen the two captive thumbscrews securing the top cover to the rest of the enclosure (**Figure 1**).
3. Slide the top cover back and up to remove it (**Figure 1**).



Support Note: To avoid damaging components due to static electricity discharge, wear an antistatic wrist strap while working inside xMac mini Server.

4. Remove the strap securing the cables to the floor of xMac mini, remove the loose Thunderbolt cable and set it aside, and then move the rest of the cables aside (**Figure 2**).



WARNING: When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle expansion cards only by their edges and avoid touching connector traces and component pins. Also, avoid touching the xMac mini Server's circuit boards and any of its components.

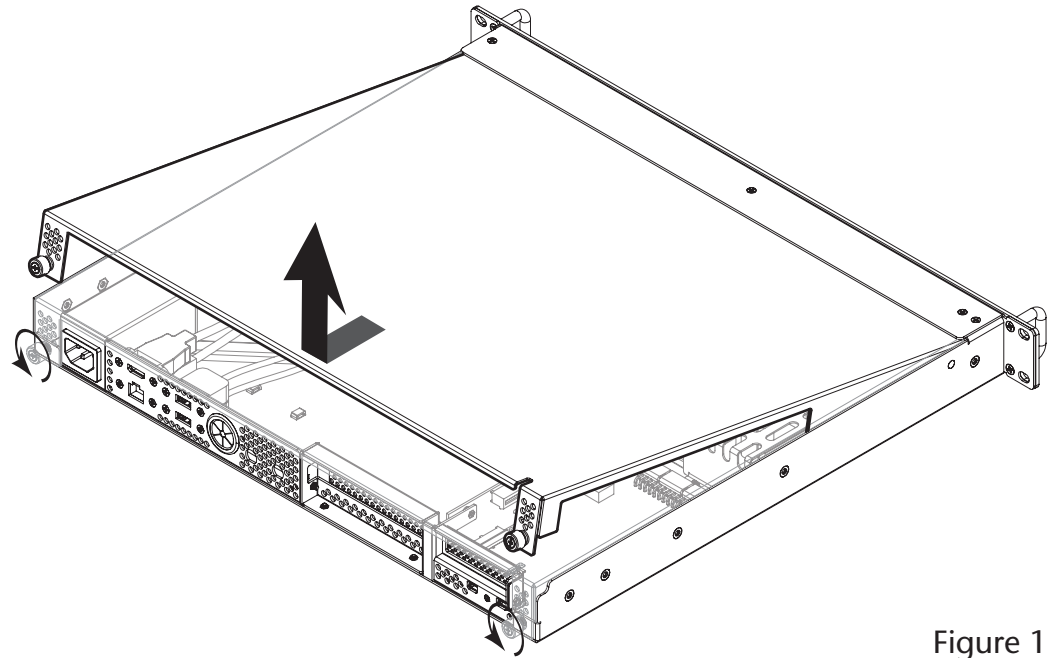


Figure 1

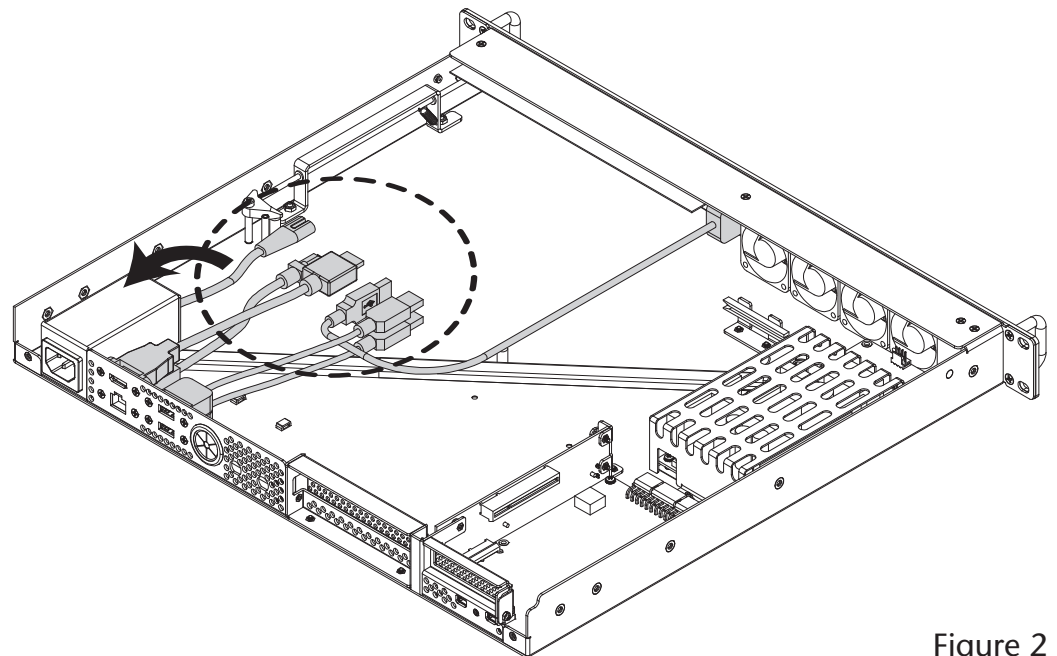


Figure 2

Chapter 3 – Computer, PCIe Cards, and xMac mini Server Installation Steps

A – PCIe Cards Installation Steps (continued)

5. If you are installing a PCIe card which includes a daughter card, install the included daughter card bracket as shown, securing the bracket with the screw through the bottom of the chassis (Figure 3).

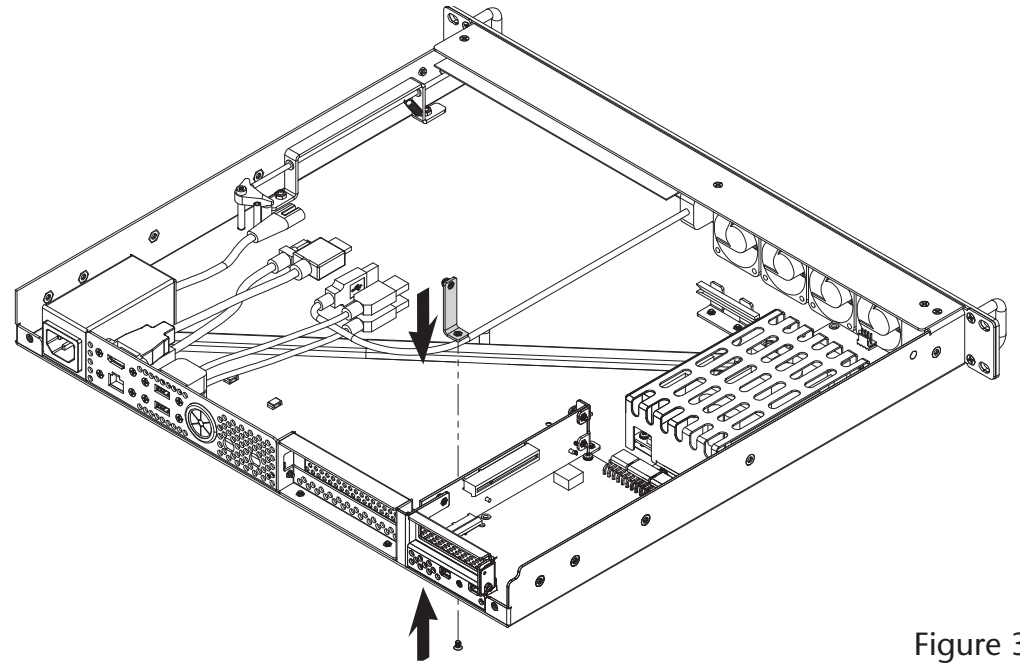


Figure 3

6. If you are installing BNC connectors for a PCIe card, do so now (Figure 4).

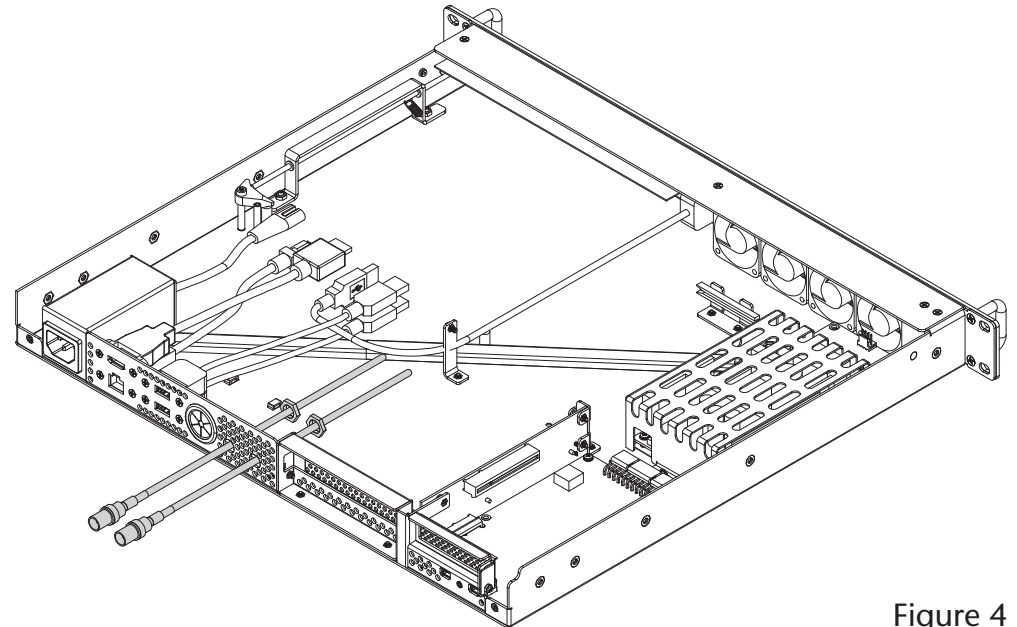


Figure 4

Chapter 3 – PCIe Cards, Computer, and xMac mini Server Installation Steps

A – PCIe Cards Installation Steps (continued)

7. If you are installing a card into PCIe Slot 1, remove and set aside the screw securing its port access cover, and then remove the cover (Figure 5).

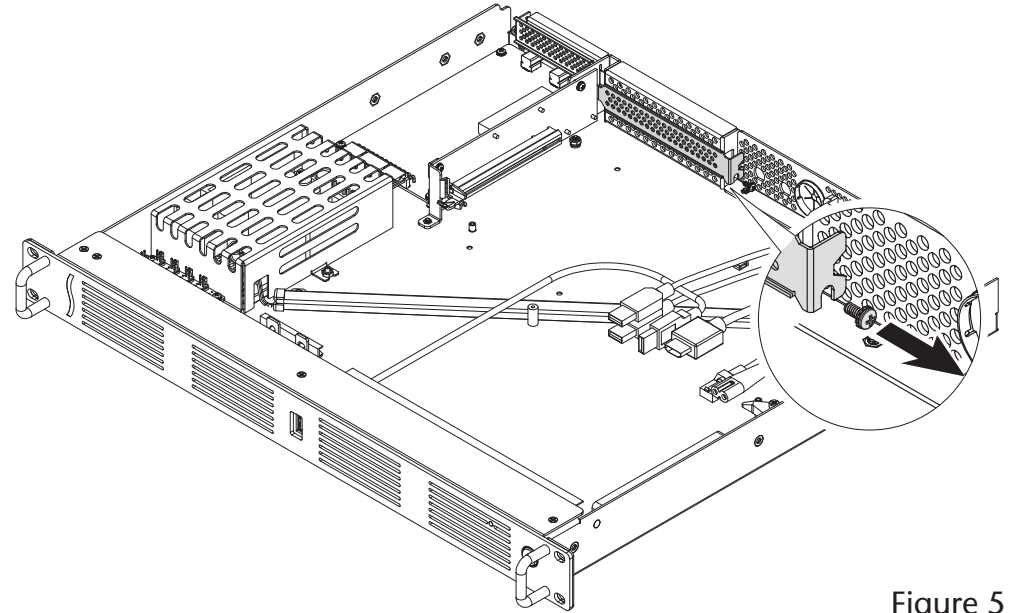


Figure 5

8. If you are installing a card into PCIe Slot 2, remove and set aside the nut securing its port access cover, and then remove the cover (Figure 6).

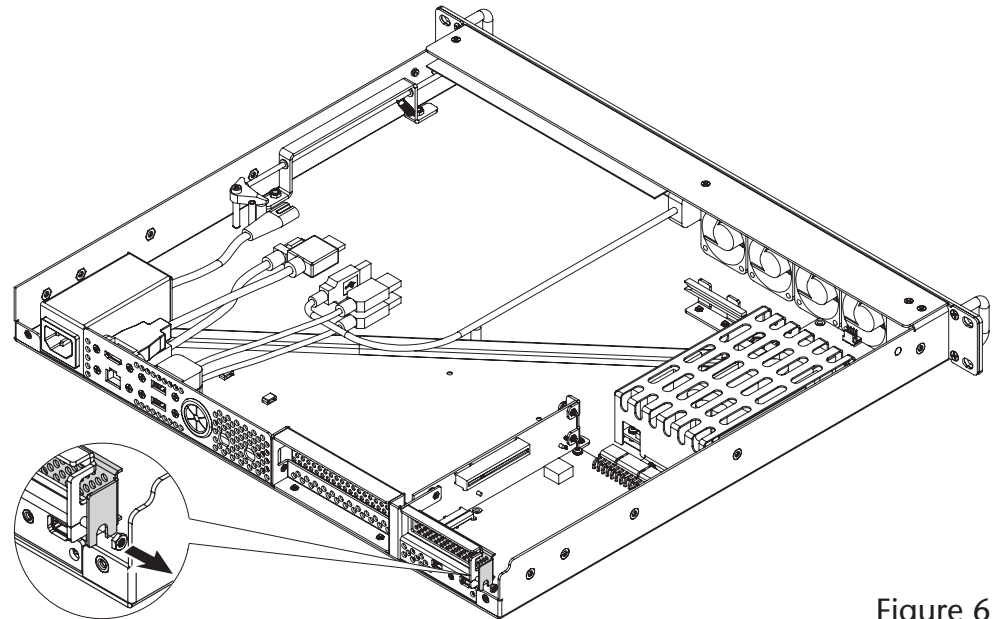


Figure 6

Chapter 3 – PCIe Cards, Computer, and xMac mini Server Installation Steps

A – PCIe Cards Installation Steps (continued)

9. If you are installing a card into PCIe Slot 1, remove the card from its packaging, handling the card by its edges and without touching any components or gold connector pins. Otherwise skip to step 12.
10. Line up the card's connector with the slot, and then gently but firmly press the card into the slot; **do not rock the card or force the card into the slot**. If you encounter excessive resistance, check the card's connector and the slot for damage, and then try inserting the card again (Figure 7).
11. Secure the card using the screw you removed previously (Figure 7).

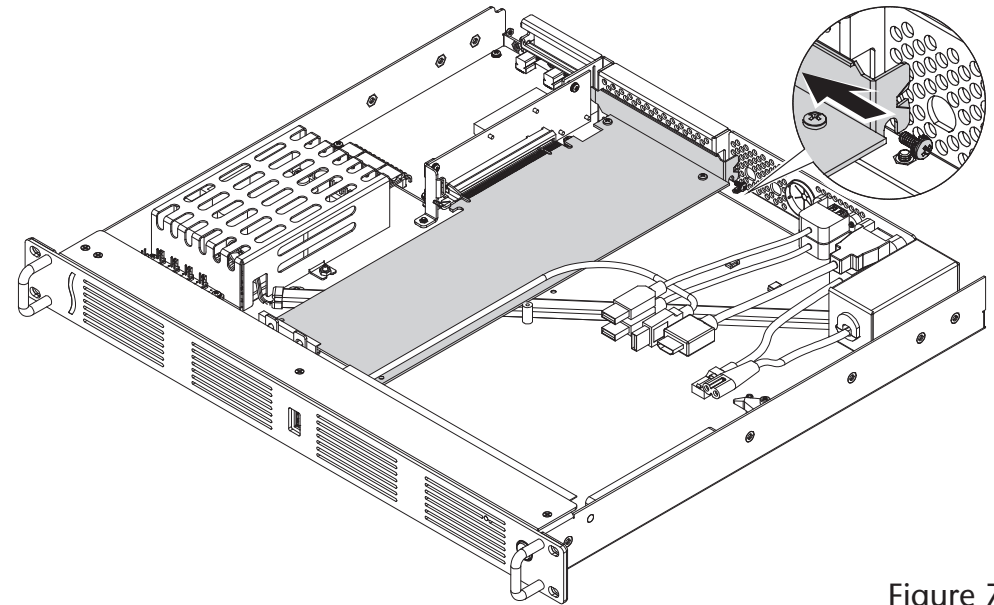


Figure 7

12. If you are installing a card into PCIe Slot 2, remove the card from its packaging, handling the card by its edges and without touching any components or gold connector pins. If necessary, swap the card's standard PCIe bracket with the card's included low-profile bracket.
13. Turn the card components side down, and then lower it into the cavity where the slot is, aligning the notch in the card bracket with the stud bolt used to secure the card (Figure 8).
14. Line up the card's connector with the slot, and then gently but firmly press the card into the slot; **do not rock the card or force the card into the slot**. If you encounter excessive resistance, check the card's connector and the slot for damage, and then try inserting the card again (Figure 8).
15. Secure the card using the nut you removed previously (Figure 8).

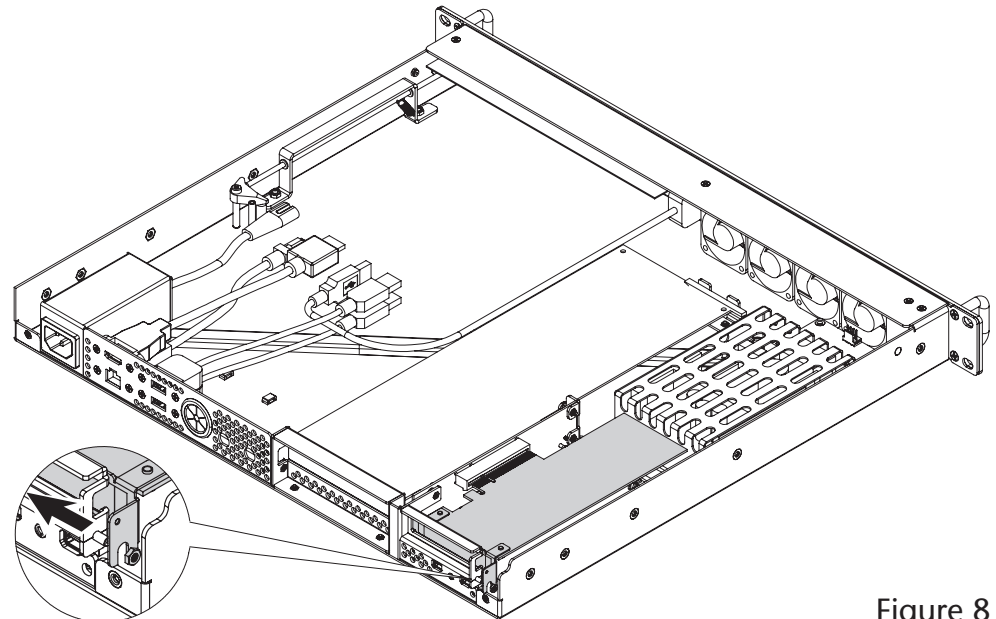


Figure 8

Chapter 3 – PCIe Cards, Computer, and xMac mini Server Installation Steps

A – PCIe Cards Installation Steps (continued)

16. If you are installed a card with a daughter card into PCIe Slot 1, remove the daughter card from its packaging, handling the card by its edges and without touching any components. Otherwise skip to step 19.
17. Turn the card components (or connector) side down, and then insert the bottom tip of the PCIe bracket into the PCIe slots' bracket, with the top of the PCIe bracket wrapped around the daughter card bracket as shown (Figure 9).
18. Secure the card to the daughter card bracket using the screw included with it (Figure 9).
19. Connect one end of the supplied Thunderbolt cable to either one of the xMac mini Server's Thunderbolt ports, and then route the other end of the cable through the external cable passthrough (Figure 10). If you are daisy chaining other Thunderbolt devices, plug in the other Thunderbolt cable into the open Thunderbolt port on the xMac mini Server.
20. Route any external cables that need to be connected to the computer (or PCIe cards) through the cable passthrough.
21. Using a Phillips screwdriver, secure the Thunderbolt cable(s) to the xMac mini Server with the supplied Thunderbolt cable lock (Figure 10).
22. If desired, secure the cables to the bottom of the xMac mini Server with cable ties.

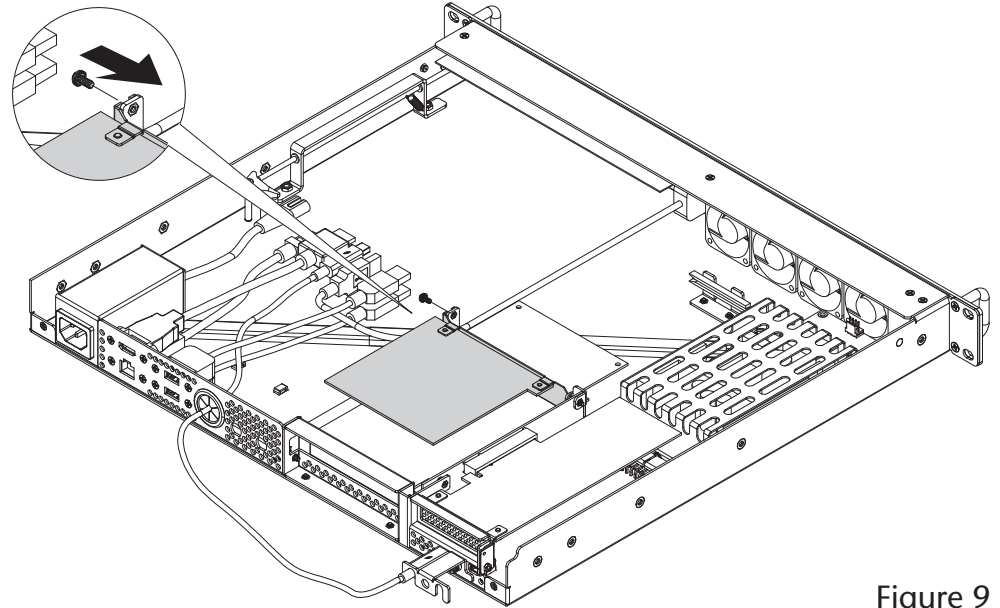


Figure 9

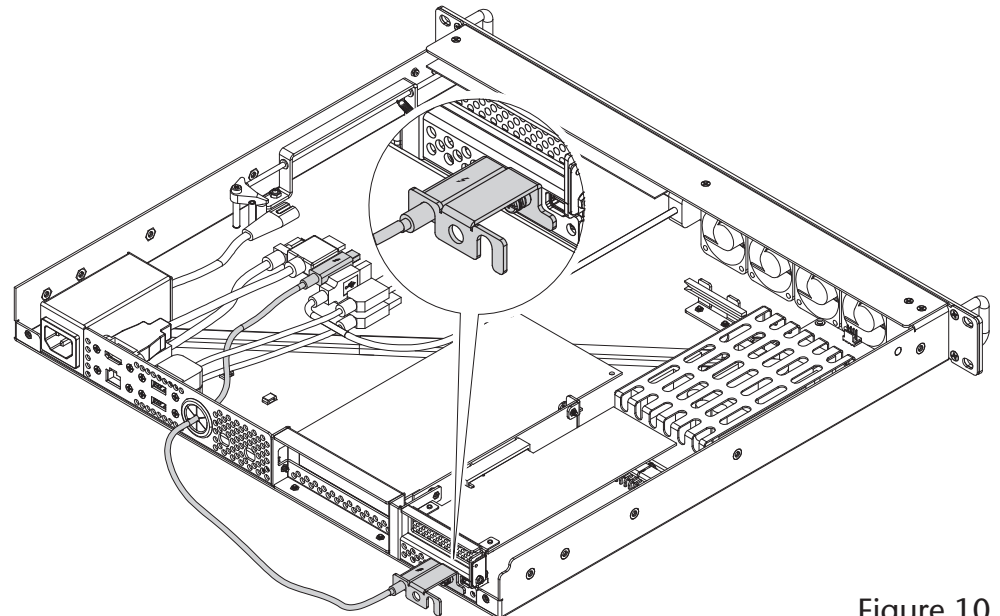


Figure 10

Chapter 3 – PCIe Cards, Computer, and xMac mini Server Installation Steps

B – Mac mini Installation Steps

1. Remove the Mac mini from its packaging.
2. Carefully insert the Mac mini under the top edge of the enclosure, push it against the gasket behind the enclosure's face plate, and then lower the computer onto the floor behind the small plastic posts (**Figure 11**).
3. Plug all the xMac mini Server's cables into the back of the Mac mini, and other cables into PCIe cards as necessary; **verify the cables are plugged in securely** (**Figure 11**).

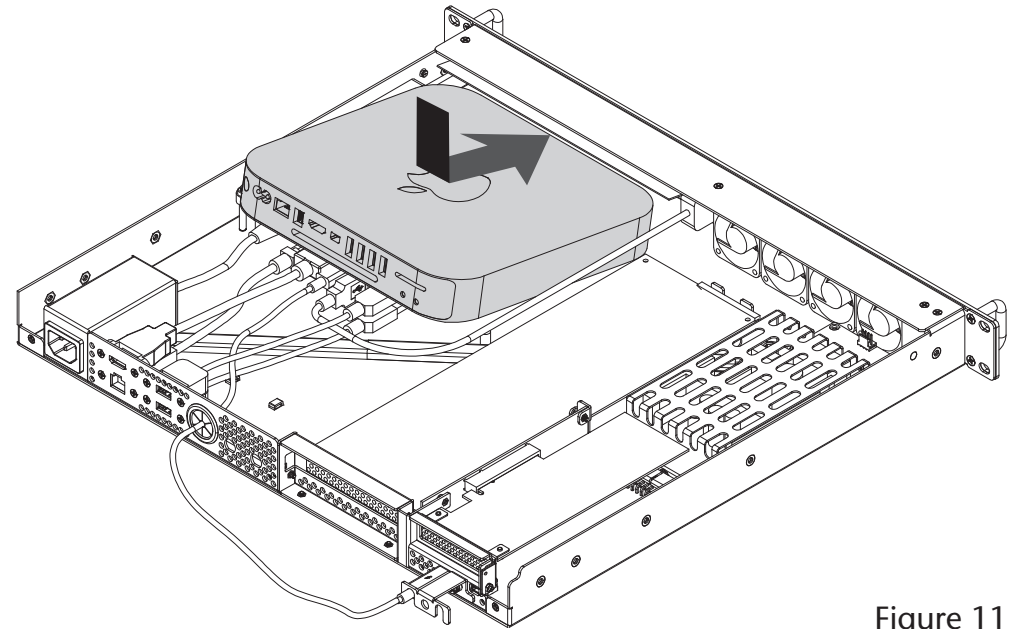


Figure 11

4. Insert the top cover under the top edge of the enclosure, lower the lid, and then secure it with the captive thumbscrews (**Figure 12**).

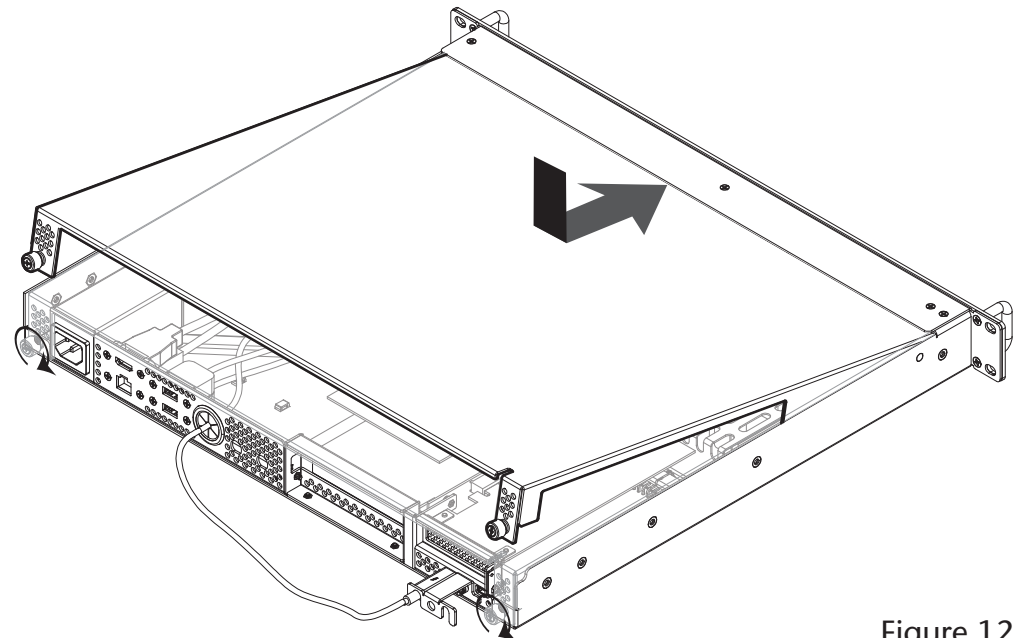


Figure 12

Chapter 3 – PCIe Cards, Computer, and xMac mini Server Installation Steps

C – xMac mini Server Rackmount Installation Information

You may mount xMac mini Server into any standard 19-inch EIA compliant equipment rack at least 16 inches deep. It is recommended that you mount xMac mini Server using rack slides or a rack shelf. Sonnet offers rack slide sets for purchase separately; please visit the site at www.sonnettech.com/product/xmacminiserver.html and click on the Accessory tab for more information.

1. Install and secure the xMac mini in the equipment rack.
2. Connect any necessary interface cables to the back of xMac mini Server; **verify the cables are plugged in securely.**
3. Connect the supplied power cable between xMac mini Server and a grounded wall outlet or power strip; **verify the cables are plugged in securely.**



Support Note: If you haven't set up your Mac mini, you will need to connect a monitor, keyboard, and mouse to complete those steps.

Chapter 4 – Verify Connections Using System Information

A – Verify the xMac mini Server is Recognized

1. Press the power button on the front panel of the xMac mini server to turn on the Mac mini. If you haven't yet set up the computer, follow the onscreen directions to complete the setup process.
2. From the Apple menu, select About This Mac; the System Information application will launch.
3. When the *About This Mac* window opens, click More Info; a summary of specifications will appear.
4. Click System Report; a full report window will appear.
5. In the *System Information* window, click Thunderbolt under the Hardware header in the left column (Figure 13).
6. In the top right column under the Thunderbolt Device Tree header, you should see Mac mini, followed “Echo Express PCIe 2.0” (Echo Express is a sister product of the xMac mini Server and uses the same Thunderbolt expansion system for PCIe cards (Figure 13).



Support Note: If you do not see “Echo Express PCIe 2.0” listed, disconnect and reconnect the Thunderbolt cable between the computer and xMac mini Server. Note that it is not necessary to shut down the computer before disconnecting and reconnecting the cable.

B – Verify Installed Cards are Recognized

1. When a card is installed into one of xMac mini Server's PCIe slots, the PCIe slot (listed as a port), the Status should appear as connected (Figure 13).
2. Click PCI Cards under the Hardware header in the left column (Figure 14).
3. At the top of the right column, installed cards are listed. By selecting a card at the top, detailed information is listed. You should see “Yes” next to Driver Installed and Tunnel Compatible, otherwise the card or driver may not be Thunderbolt compatible (Figure 14).



Support Note: While xMac mini Server requires no drivers, installed cards require Thunderbolt-compatible drivers to enable their use with xMac mini Server.

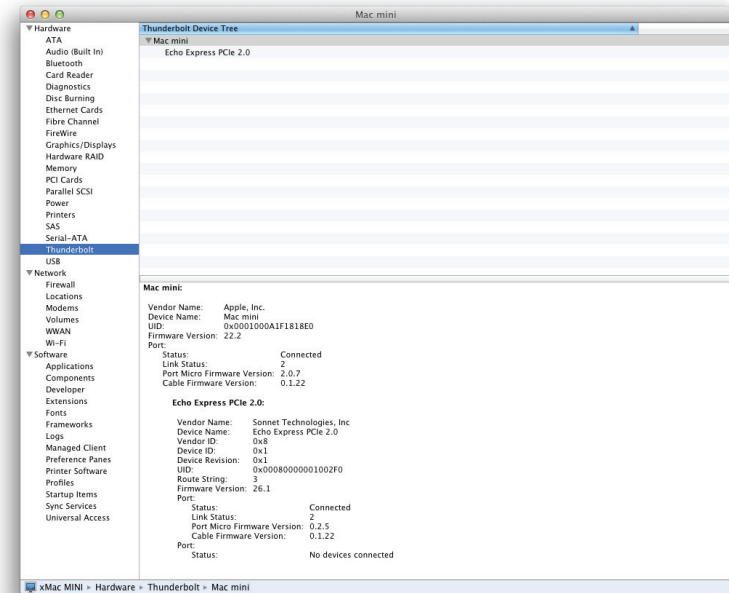


Figure 13

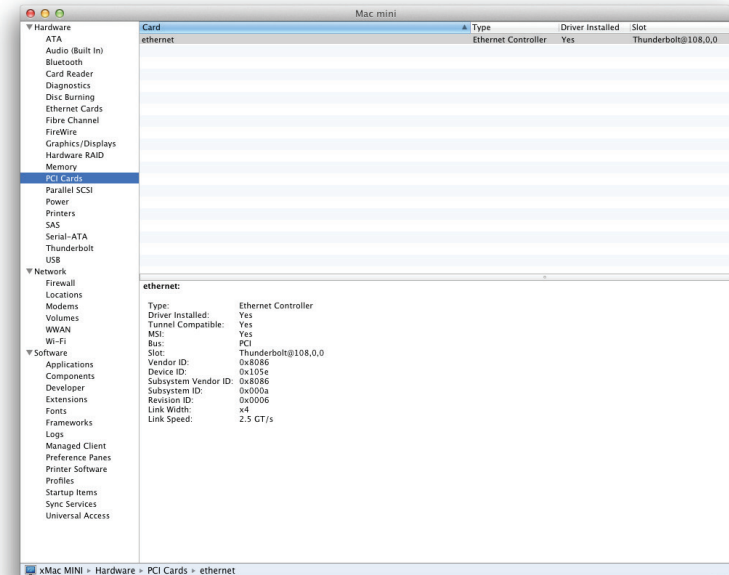


Figure 14

Chapter 5 – Tips and Known Issues

TIPS

Cooling xMac mini Server and Everything Inside It

With its optimized airflow design and four temperature-controlled fans providing adequate cooling at all times, xMac mini server may be installed anywhere in a rack. *Do not block any of the vents!* Otherwise, the Mac mini, installed cards, and xMac mini Server's components may overheat

Connecting Additional Thunderbolt Devices

You may connect up to five additional Thunderbolt devices in a daisy chain to xMac mini Server, including the Apple Thunderbolt Display

Using Expansion Cards Without Drivers

Some Thunderbolt-compatible expansion cards, like Sonnet's Allegro™ FW800 PCIe FireWire® adapter and Sonnet's Tempo™ SATA Pro 6Gb eSATA cards, use drivers built into the OS. Cards listed as Thunderbolt-compatible, but stating “no drivers required” fall into this category

Some PCIe Cards May Not Fit Slot in Slot 2

Cards installed into slot 2 (for low profile, half-length cards) must meet the following criteria: 1) the card must be no more than 6.9 inches (17.5 cm) long, and 2) the card must use a low-profile bracket

Replacing Cards or Adding Cards After Initial Installation

If you decide to replace or add a card to xMac mini server after the initial setup installation, shut down the system and disconnect power to it before installing a card. Depending on the size of the card, it may be necessary to remove the Mac mini to enable the installation of the card into slot 1

KNOWN ISSUES

Not all PCIe Cards Will Perform at 100%

Thunderbolt's PCIe bandwidth is limited to 10 Gb/s. While many cards will operate at full performance, some may not due to the fact they require more bandwidth than Thunderbolt is capable of delivering

Software Updates May Break Compatibility

Specific device drivers that work under one version of OS X may not work under a later version. It is even possible that an OS X update may break compatibility. *Before updating to the latest drivers or OS version,* we recommend that you contact your PCIe cards' manufacturers to verify that the existing drivers work, and check online forums for reports of issues with the latest OS update

Some Devices' Performance May be Affected by Where They Are Connected in a Thunderbolt Chain

However small, Thunderbolt introduces latency to a device chain. If you expand with additional Thunderbolt expansion chassis, you may need to experiment with which cards work better in chassis closer or farther to the Mac mini in the chain

Chapter 6 – Specifications, Precautions, FCC Compliance, and Support Information

Specifications

External Connectors (Front Panel)	USB 3.0
External Connectors (Back Panel)	Two Thunderbolt Two USB 3.0 RJ-45 HDMI Power (C14-type)
Internal Connectors	Three USB 3.0 RJ-45 HDMI Power (C7-type)
Expansion Slots	One x16 mechanical, x4 electrical PCIe 2.0 One x8 mechanical, x4 electrical PCIe 2.0
PCIe Cards Supported	One full-length, full-height, single-width x16 PCIe card One low-profile, half-length x8 PCIe card ⁽¹⁾
Compatible PCIe Cards	See Sonnet Website (www.sonnettech.com)
Power Supply (for PCIe Slots, Thunderbolt Expansion Board, etc.)	Universal 100W, 100-240V AC, 50-60 Hz
Operating Temperatures	+32° F to +95° F (0° C to +35° C)
Dimensions WxDxH:	19 x 15.8 x 1.72 in. (48.3 x 39.7 x 4.4 cm)
Weight	15.0 lb (6.8 kg)
RoHS Compliant	Yes

1. Requires the use of a low-profile PCIe bracket

Safety Precautions

Please read this section carefully before proceeding. These precautions explain the correct and safe use of this device, thereby helping to prevent injury to you or others, and also help you to minimize the risk of damaging the device.

Warnings

Always follow the basic warnings listed here to avoid the risk of serious injury or death from electrical shock, short-circuiting, fire, and other hazards. These warnings include, but are not limited to:

- Aside from replacing user-replaceable parts, do not attempt to disassemble the enclosure. If this device appears to be malfunctioning, contact your reseller or local distributor
- Do not drop or mishandle the product; dropping or mishandling the product may result in a malfunction leaving the product inoperable
- Do not expose the device to rain, use it near water or containers that contain liquids which might spill into any openings, or in damp or wet conditions
- If unusual smells, sounds, or smoke come from the device, or if liquids enter it, switch it off immediately and unplug it from the electrical outlet
- Follow the instructions in this manual carefully; contact your reseller or local distributor for additional advice not covered in this User's Guide

FCC Compliance

xMac mini Server complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: This device may not cause harmful interference, AND this device must accept any interference received, including interference that may cause undesired operation.

Contacting Sonnet Customer Service

USA Customers

The Sonnet Website located at www.sonnettech.com has the most current support information and technical updates. Before you call Sonnet Customer Service, please check our Website for the latest updates and online support files, and check this User's Guide for helpful information. When you call Sonnet Customer Service, have the following information available so our customer service staff can better assist you:

- Product name
- Product serial number
- Date and place of purchase
- Computer model
- PCIe card models
- Operating system version
- Software/firmware versions

If further assistance is needed, please contact **Sonnet Customer Service** at:

Online Service Form: <http://serviceform.sonnettech.com>

Tel: 1-949-472-2772

(Monday–Friday, 7 a.m.–4 p.m. Pacific Time)

E-mail: support@sonnettech.com

For Customers Outside the USA

For support on this product, contact your reseller or local distributor.

Visit Our Website

For the most current product information and online support files, visit the Sonnet Website at www.sonnettech.com/support/. Register your product online at <http://registration.sonnettech.com> to be informed of future upgrades and product releases.



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