Avigilon Video Archive Installation Guide

AVA-HED1-225TB, AVA-HED1-488TB, AVA-HED1-751TB,
AVA-EXP1-263TB, AVA-EXP1-526TB, AVA-EXP1-789TB

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Before You Begin

The Avigilon Video Archive provides additional storage for video from the Avigilon Control Center (ACC) system.

The Avigilon Video Archive consists of a head unit that hosts the storage controllers and directly connects to up to 4 Network Video Recorders (NVRs), or up to 12 NVRs with the use of 2 network switches. The expansion unit adds capacity to the installed head unit. The installation steps in this guide describe how to install the Avigilon Video Archive and connect it to the NVRs and optional switches.

Note: All of the documents referred to in this guide are available from **avigilon.com/products/video-infrastructure/video-archive**.

Check the Avigilon Video Archive Pre-Deployment Checklist to ensure that you have received all of the components of the Video Archive solution. Depending on your storage requirements, your Video Archive solution includes:

- Video Archive head unit for up to 0.75 PB of storage
- Video Archive expansion unit to add extra storage up to a total of 1.5 PB
- Video Archive Connectivity Kit for each NVR to be connected
- NVR 2nd CPU Kits for each NVR5-STD, NVR4 STD, NVR4X STD, and NVR4X PRM 64/96/128/157 TB to be connected

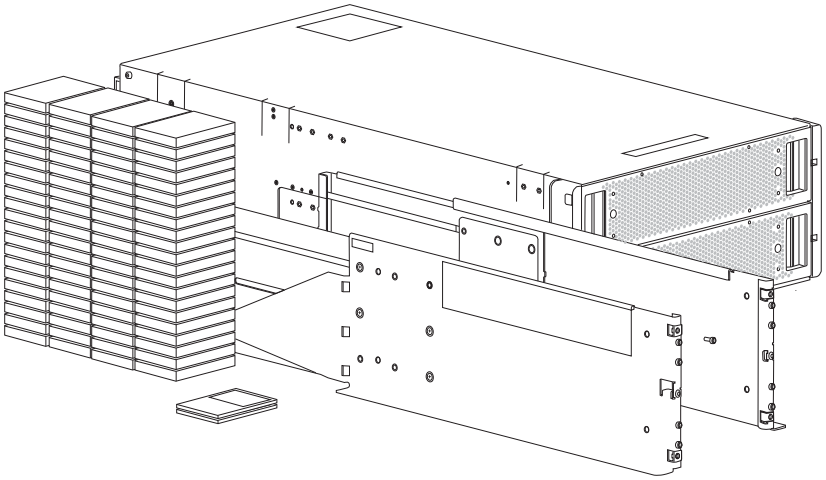
A Video Archive unit requires 220V power and C20 or NEMA power plugs.

Package Includes

Important: Before you set up and operate any Video Archive head or expansion unit, review the safety instructions that came with the hardware.

Video Archive Head Unit

- Documentation QR card (used to access the equipment documentation online)
- 5U head unit
- 2 × power cables
- 1 to 3 packages of 28 disk drives in carriers (DDICs)
- Rackmount kit for the unit



Video Archive Expansion Unit

You can connect one expansion unit to the head unit. The expansion unit adds additional disk storage capacity to an Avigilon Video Archive system and is physically the same as the head unit, except the expansion unit has no controller modules and can only be connected to a controller module on a Video Archive head unit. The Video Archive expansion unit includes:

- Documentation QR card
- 5U expansion unit
- 2 × power cables
- 2 × SAS cables
- 1 to 3 packages of 28 DDICs
- Rackmount kit for the unit

Deployment Options

There are 2 options when deploying an Avigilon Video Archive. Each option has its own limitations and requirements. Review the information below to determine which option fits your site requirements:

- **Direct Connection**: directly connect up to 4 NVRs to the Video Archive head unit. This is a basic setup that limits archiving to a maximum of 4 NVRs.
- **Network Switch Connection**: connect up to 12 NVRs to 2 network switches which are then connected to the Video Archive head unit. This option is also called a Storage Area Network (SAN), and allows for more NVRs to be connected, but requires sourcing 2 network switches to complete the setup. Make sure that the network switches sourced for this setup meet the minimum switch requirements. For more information, see *Minimum Network Switch Requirements* on page 5.

Direct Connection

This type of installation directly connects up to 4 NVRs to the Video Archive head unit. This is a basic setup that limits archiving to a maximum of 4 NVRs. Each NVR has 2 optical cables. One optical cable from each NVR must be connected to Controller A on the Video Archive head unit, and the other cable must be connected to Controller B.

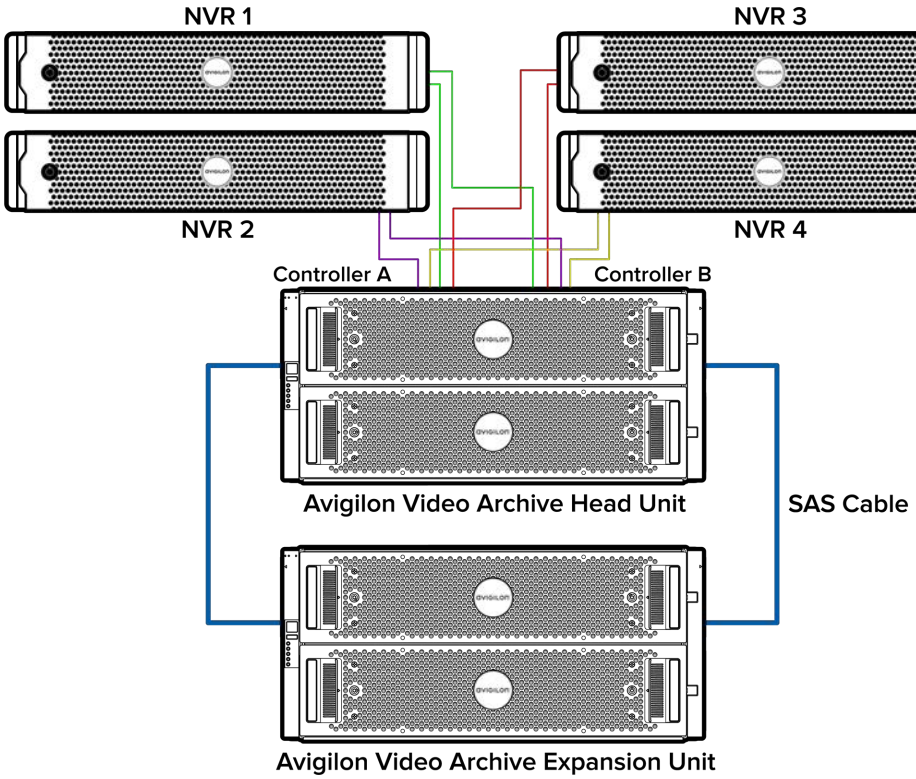


Figure 1: Video Archive direct connection deployment with 4 NVRs.

Follow the steps in the sections below to set up a direct connection deployment:

1. *Install NVR Connectivity Kits* on page 7
2. *Install the Video Archive* on page 9
3. *Prepare the Components to be Connected* on page 12
4. *Direct Connection Cabling* on page 17
5. *Power the Equipment* on page 23
6. *Connect a Laptop to the Video Archive* on page 24
7. *Next Steps to Deploy the Video Archive* on page 25

Switch Connection

This type of installation connects up to 12 NVRs to 2 network switches which are then connected to the Video Archive head unit. This option allows for more NVRs to be connected, but requires sourcing 2 network switches to complete the setup.

- Each NVR has 2 optical cables. One optical cable from each NVR must be connected to Switch A, and the other cable must be connected to Switch B.
- The 4 optical ports on Controller A of the Video Archive head unit must be connected to 4 Uplink ports on Switch A. The 4 optical ports on Controller B must be connected to 4 Uplink ports on Switch B.

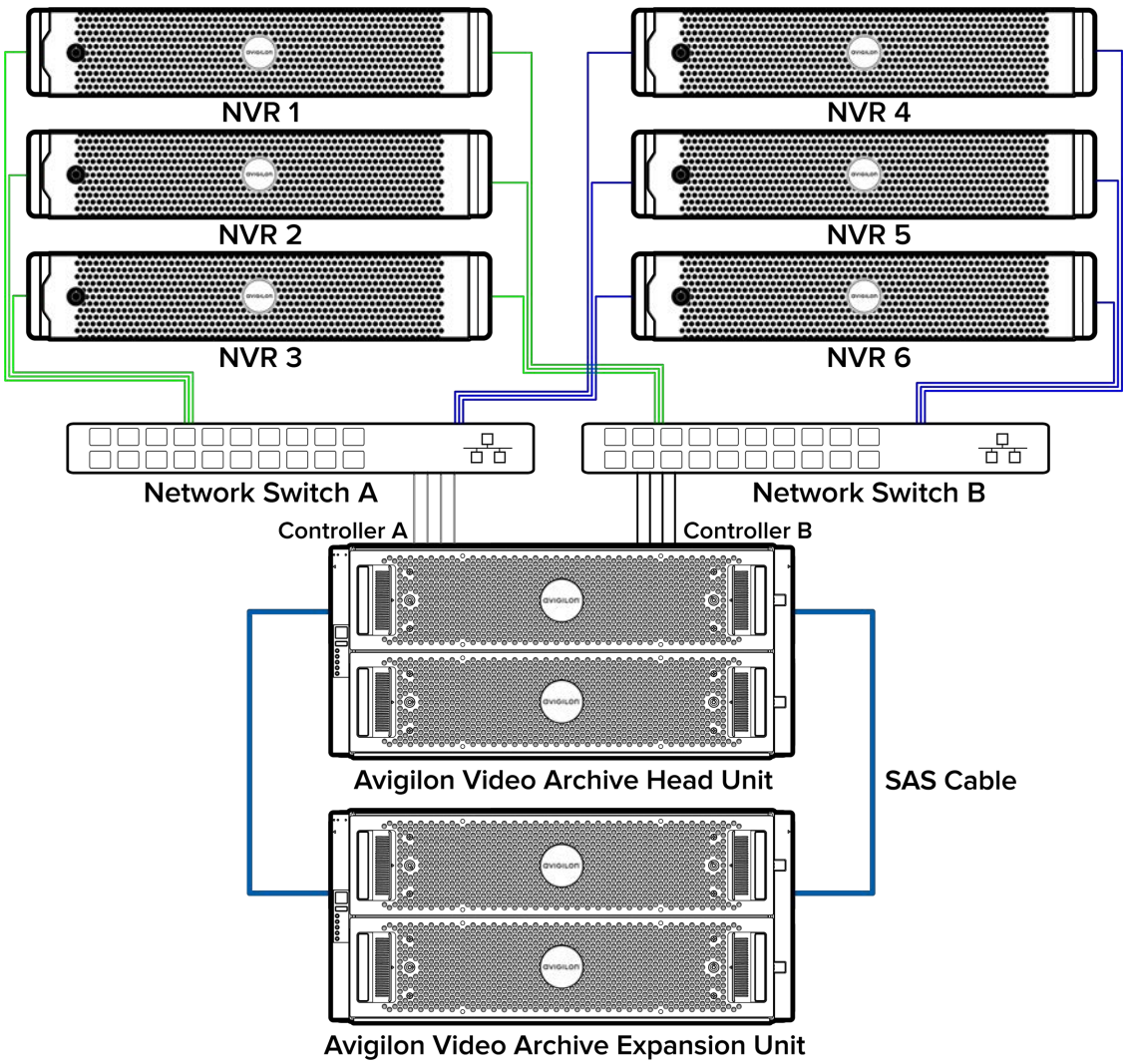


Figure 2: Video Archive switch connection deployment with 6 NVRs. Up to 12 NVRs can be connected in this scenario.

Follow the steps in the sections below to set up a switch connection deployment:

1. *Install NVR Connectivity Kits* on page 7
2. *Install the Video Archive* on page 9
3. *Prepare the Components to be Connected* on page 12
4. *Network Switch Connection Cabling* on page 20
5. *Power the Equipment* on page 23
6. *Connect a Laptop to the Video Archive* on page 24
7. *Next Steps to Deploy the Video Archive* on page 25

Minimum Network Switch Requirements

To deploy the Video Archive with more than 4 NVRs, you will need to source 2 network switches. Avigilon does not sell the required switches, so they must be sourced separately. Make sure to follow the

requirements below when selecting your switches:

- Two switches are required for redundancy. Both switches should have the same capabilities.
- Each switch must support at least 10 GbE networking speeds.
- Each switch must have 4 SFP+ Uplink ports for connecting to the Video Archive head unit.
- Each switch must have 1 SFP+ port to connect to each NVR in your system, up to a maximum of 12.

  For example, if you are connecting the maximum of 12 NVRs, each switch will need 12 SFP+ ports to connect to these NVRs.

Install NVR Connectivity Kits

Before you can connect an NVR to the Avigilon Video Archive, you must first install additional equipment on each NVR.

Important: You must power down the NVRs to install these kits.

For each NVR, you must install the Video Archive Connectivity Kit (the Connectivity Kit). Each kit contains a converged network adapter (CNA) card or storage area network (SAN) card for a specific NVR model. All of the kits come with all of the necessary SFP+ transceivers and optical cables to connect an NVR to the Video Archive. Refer to the instructions in ***Installing an NVR Video Archive Connectivity Kit***. Make sure to use the connectivity kit that corresponds to your NVR model:

NVR5

Direct Attach Connectivity Kits

Includes a CNA card and a set of 2 transceivers with optical cables for directly connecting the NVR to the Avigilon Video Archive.

- **NVR5 PRM 252/288/360/432 TB**: AVA-HED1-NVR5-CONNECT-B
- **NVR5 STD** and **NVR5 PRM 96/128/160/192/224 TB**: AVA-HED1-NVR5-CONNECT-A

Note: The NVR5 Premium 192/224 TB models support connections to the Avigilon Video Archive out of the box and does not require installation of a CNA or SAN card. However, the Connectivity Kit is still required for the transceivers and optical cables used to make the connections.

Storage Area Network (SAN) Connectivity Kits

- **NVR5 PRM 252/288/360/432 TB**: NVR5-AVA-SAN-CONNECT-B for a CNA card and a set of 2 transceivers with optical cables for connecting the NVR with SAN networking through network switches.
- **NVR5 STD** and **NVR5 PRM 96/128/160/192/224 TB**: NVR5-AVA-SAN-CONNECT-A for a CNA card and a set of 2 transceivers with optical cables for connecting the NVR with SAN networking through network switches.
- **Avigilon Video Archive**: AVA-SAN-CONNECT-1 or AVA-SAN-CONNECT-8 for a set of 1 or 8 transceivers with optical cables for connecting the Avigilon Video Archive with SAN networking through network switches.

NVR4X

Direct Attach or Storage Area Network Connectivity Kits

- **NVR4X PRM 64/96/128/157 TB**: AVA-HED1-NVR4X-PRM1-CONNECT
- **NVR4X PRM 192/217 TB**: AVA-HED1-NVR4X-PRM2-CONNECT
- **NVR4X STD**: AVA-HED1-NVR4X-STD-CONNECT

NVR4

Direct Attach or Storage Area Network Connectivity Kits

- **NVR4 PRM** and **NVR4 STD**: AVA-HED1-NVR4-CONNECT

2nd CPU Kits

For each **NVR5 Standard**, **NVR4 Standard**, **NVR4X Standard**, and **NVR4X Premium 64/96/128/157 TB** you also must install a 2nd CPU Kit. This kit provides all the components needed to add CPU redundancy to these NVRs. Refer to the **installation instructions** provided with this kit.

Important: Additional power is required in order to enable the 2nd CPU Kit in the NVR5 Standard systems. To achieve this, replace the 800W PSU with an 1100W PSU (NVR5-PSU-1100W-A1), add a second 800W PSU (NVR5-PSU-800W) and disable PSU redundancy support, or replace the 800W PSU with two 1100W PSUs (NVR5-PSU-1100W-A1) and enable PSU redundancy support.

- **NVR5-STD**: NVR5-STD-2NDCPU (ordered separately)
- **NVR4 STD**: HD-NVR4-STD-2NDCPU (ordered separately)
- **NVR4X PRM 64/96/128/157 TB**: 2nd CPU Kit included with AVA-HED1-NVR4X-PRM1-CONNECT
- **NVR4X STD**: 2nd CPU Kit included with AVA-HED1-NVR4X-STD-CONNECT

Note:

- You can connect as many as 12 NVRs to a Video Archive head unit through 2 network switches. See *Network Switch Connection Cabling* on page 20 for connection instructions.
- You can connect 4 NVRs directly to a Video Archive head unit. See *Direct Connection Cabling* on page 17 for connection instructions.

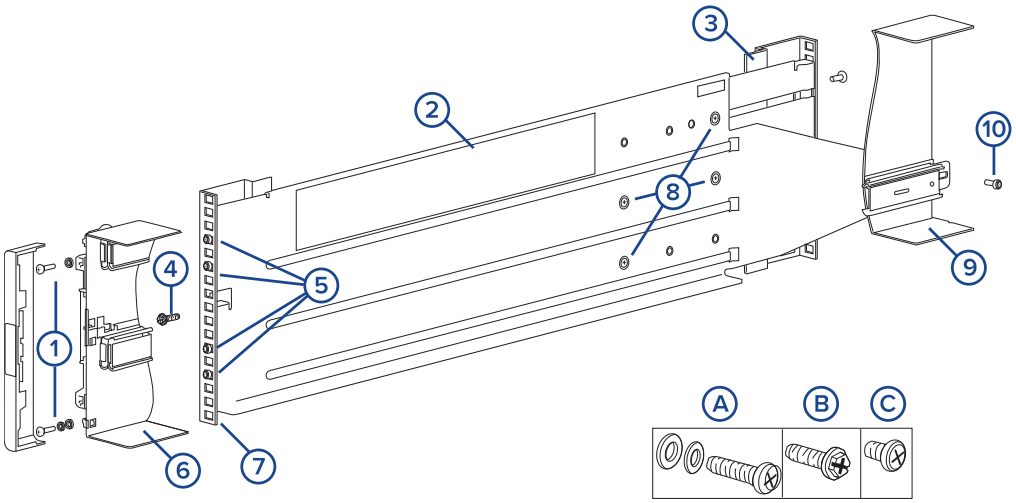
Install the Video Archive

Mount the Units

Follow the same instructions for mounting both units and installing the disk cartridges if you are connecting the head unit and expansion unit at the same time.

- Before mounting, remove the rear panel modules.
- Use a mechanical lift to mount a Video Archive unit.
- The rack may fall over if allowed to become top-heavy. Load the rack from the bottom up with the heaviest chassis at the bottom.
- Secure the head unit to the rack using the mounting screws located in the plastic bag.

WARNING — Potential injury — each chassis is heavy.



Item	Description	Item	Description
1	Fastening screws (A)	7	Front rack post (square hole)
2	Left rail	8	Middle slide locking screws
3	Rear rack post - square hole	9	Front left portion of 5U chassis shown for reference
4	Clamping screw (B)	10	Fastening screw (C)
5	Rail location pins (4 per rail)	A, B, C	Rail kit fasteners used in rack-mount installation
6	Rear left portion of 5U chassis shown for reference		

1. With the preassembled rails at their shortest length, locate the rail location pins inside the front of the rack, and extend the length of the rail assembly to position the rear location pins. Ensure the pins are fully inserted in the square or round holes in the rack posts.
2. Fully tighten all clamping screws and middle-side locking screws.
3. Ensure the 4 rear space clips (not shown) are fitted to the edge of the rack post.
4. Slide the unit until it is fully seated on its rails.
5. Fasten the front and rear of the unit using the fastening screws.
6. Reinsert the rear panel modules.

Connect the Controller to the Expansion Unit, if supplied

Use the SAS cables provided with the expansion unit to connect the head unit to the expansion unit as shown in the image below. For more information about installing the expansion unit, see the *Avigilon Video Archive Expansion Unit Installation and Setup Guide* available at **avigilon.com/products/video-infrastructure/video-archive**.

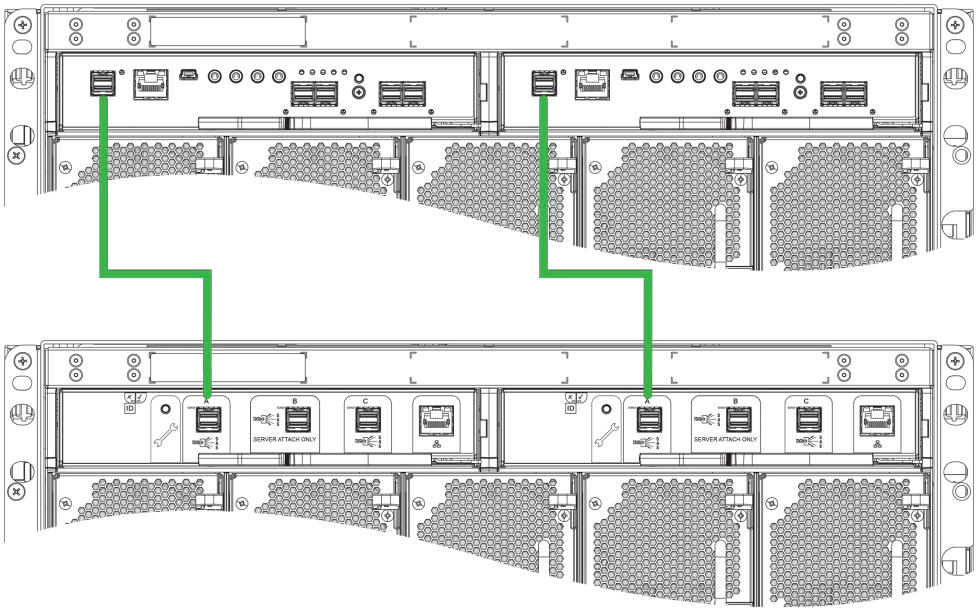


Figure 3: Head (top unit) to expansion unit (bottom unit) cabling

Install the Disk Drives

The Avigilon Video Archive head and expansion units are shipped without the disk drives in carriers (DDICs) installed. The DDICs are shipped in packages of 28, ready to be installed in the Video Archive units. You must install all the DDICs supplied with your Video Archive solution.

The DDICs are installed in two disk drawers that are accessed from the front of the units. You must install a minimum of 14 DDICs (one row) in each drawer for a total of 28 DDICs.

The top of each DDIC has a latch button in the center, an orange arrow label at one end, and a single Drive Fault LED at the other end. The yellow indicator next to the center latch button indicates the latch is unlocked.

1. Use the recessed handles at the side to slide a drawer open.
2. Beginning at the front of each drawer:
    a. Add the DDICs to the disk slots in the drawer in complete rows (14 disks at a time).
    b. Alternate between the top and bottom drawers. Install the first 14 DDICs in slots 0 through 13 in the top drawer and the next 14 DDICs in slots 42 through 55 in the bottom drawer. After that, install slots 14 through 27, and so on, working from back to front in each drawer.
3. Insert each drive cartridge into its slot with the orange arrow pointed to the back of the unit:
    a. Push the DDIC down into the slot.
    b. Firmly push the DDIC in the direction of the arrow until the center latch locks into place.
    c. Check that the yellow unlocked indicator is no longer showing.

Prepare the Components to be Connected

Prepare the NVRs to be Connected

Before connecting the NVRs to the Video Archive, you will need to install the following kits. For more information, see *Install NVR Connectivity Kits* on page 7.

- Video Archive Connectivity kit must be installed on all NVRs.
- 2nd CPU kit must be installed on NVR5 Standard, NVR4 Standard, NVR4X Standard, and NVR4X Premium 64/96/128/157 TB.

Make the following preparations to the NVRs that you will be connecting.

NVR5 STD

1. Ensure the 2nd CPU Kit is installed.
2. Ensure the CNA/SAN card from the Connectivity Kit is installed in PCI slot 5.
3. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot of the CNA/SAN card.

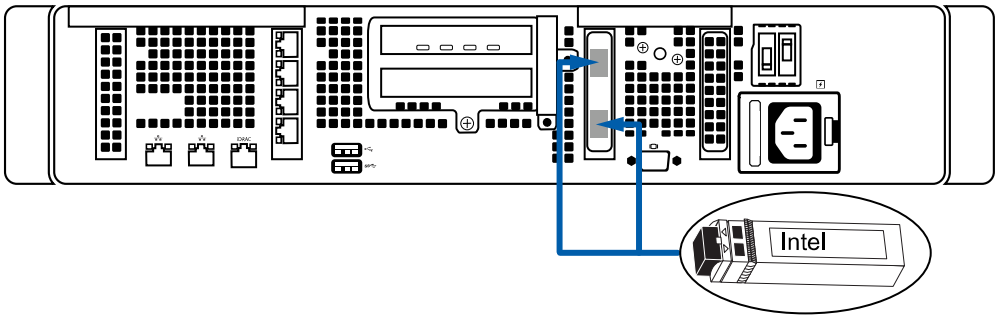


Figure 4: NVR5 STD transceiver installation into PCI slot 5 receptacles

NVR5 PRM 252/288/360/432 TB

1. Ensure the CNA/SAN card from the Connectivity Kit is installed in PCI slot 1.
2. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot of the CNA/SAN card.

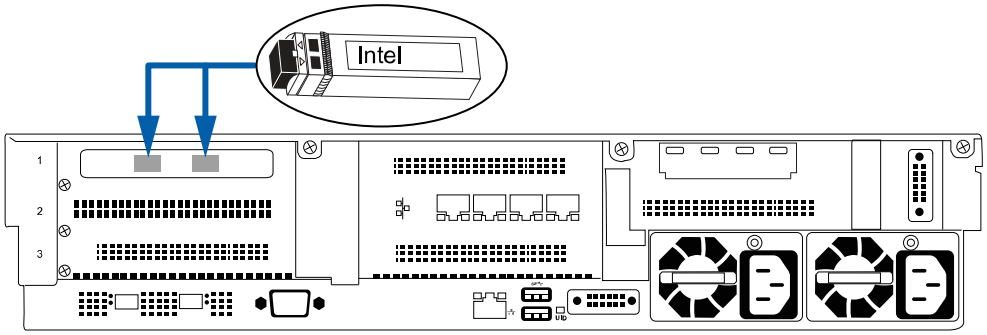


Figure 5: NVR5 PRM 252/288/360/432 TB transceiver installation into PCI slot 1 receptacles

NVR5 PRM 192/224 TB

1. This model supports a direct connection out of the box with the built-in 10G network card in PCI slot 1.
2. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot in PCI slot 1.

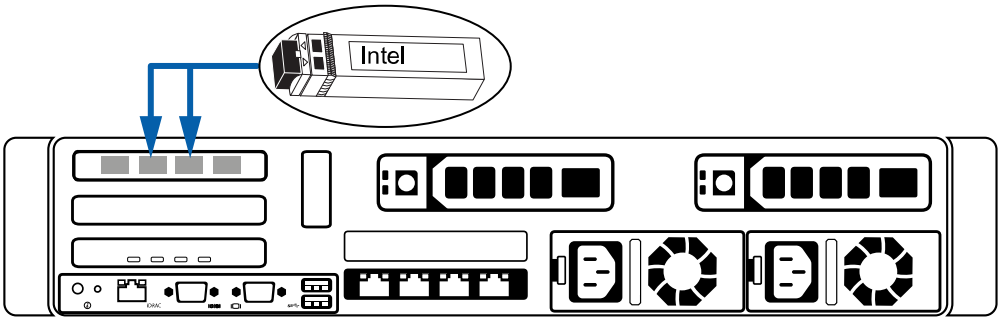


Figure 6: NVR5 PRM 192/224 TB transceiver installation into PCI slot 1 receptacles

NVR5 PRM 96/128/160 TB

1. Ensure the CNA/SAN card from the Connectivity Kit is installed in PCI slot 4.
2. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot of the CNA/SAN card.

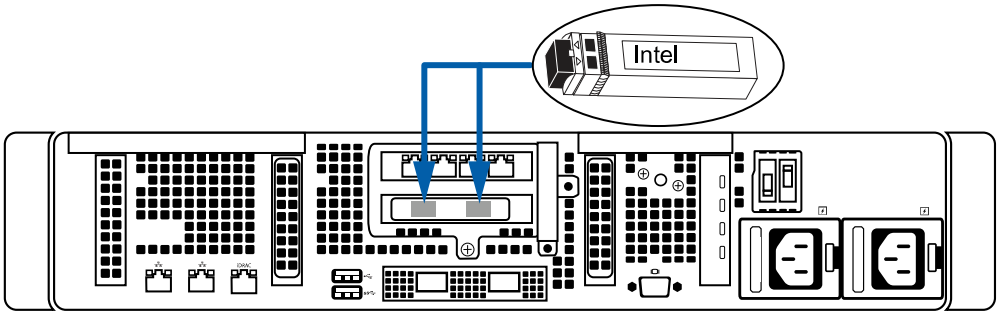


Figure 7: NVR5 PRM 96/128/160 TB transceiver installation into PCI slot 4 receptacles

NVR4 STD, NVR4X STD, and NVR4X PRM 64/96/128/157 TB

1. Ensure the 2nd CPU Kit is installed.
2. Ensure the CNA card from the Connectivity Kit is installed in PCI slot 4.
3. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot of the CNA card.

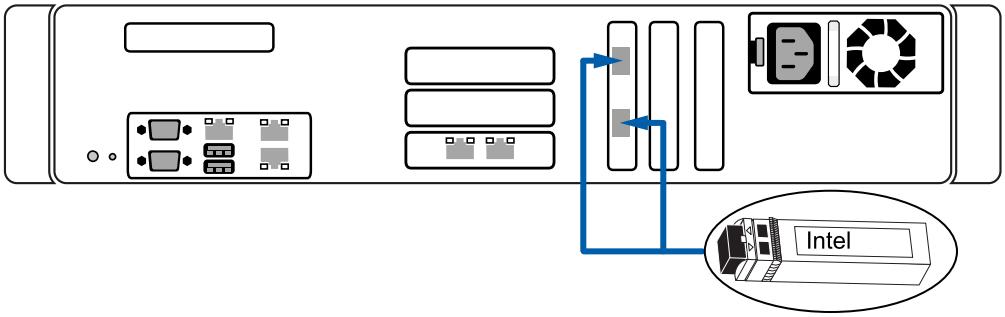


Figure 8: NVR4 STD, NVR4X STD, NVR4X PRM 64/96/128/157 TB transceiver installation into PCI slot 4 receptacles

NVR4 PRM and NVR4X PRM 192/217TB

1. Ensure the CNA card from the Connectivity Kit is installed in PCI slot 4.
2. Insert an Intel® SFP+ transceiver (from a box labeled Intel® in the Connectivity Kit) in each short-range optical transceiver slot of the CNA card.

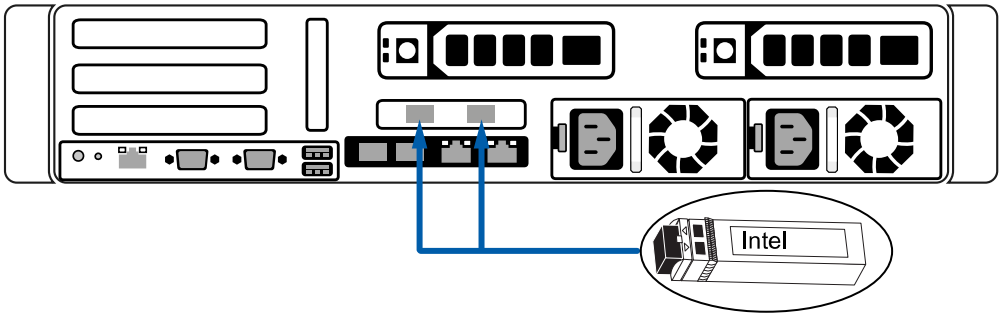


Figure 9: NVR4 PRM transceiver installation into PCI slot 4 receptacles

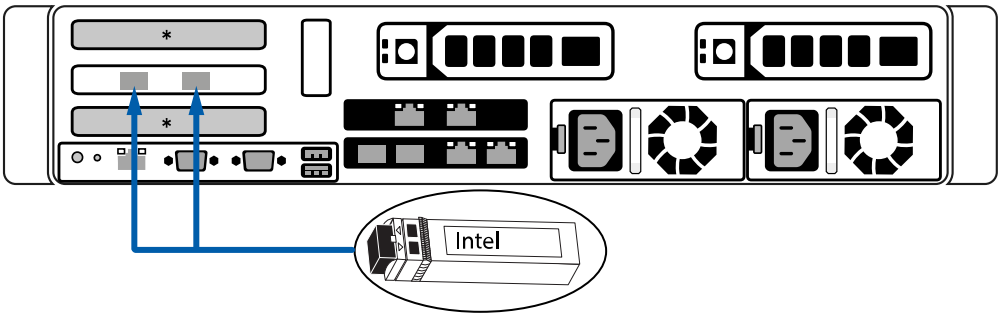


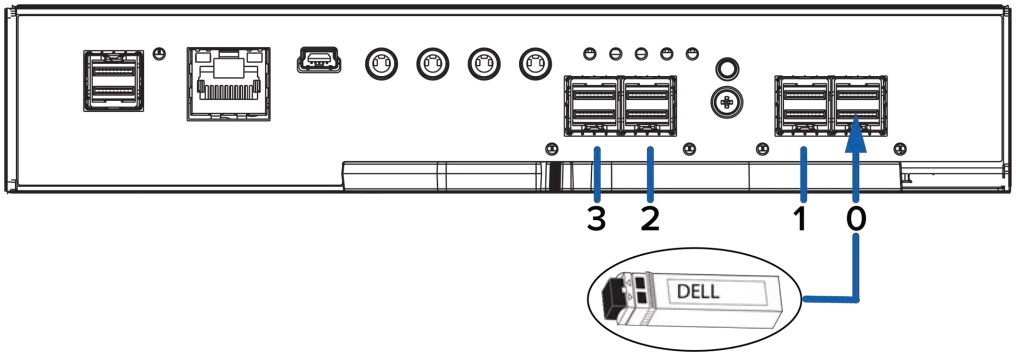
Figure 10: NVR4X PRM 192/217 TB transceiver installation into PCI slot 2 receptacles

Prepare the Video Archive to be Connected

On the Video Archive, install a Dell SFP+ transceiver for each NVR you are connecting in each controller if you are directly connecting the NVRs. If you are connecting the NVRs through the network switch option, install the Dell SFP+ transceiver into all 4 ports on each controller. There are two Dell SFP+ transceivers (in a box labeled Dell) in each Connectivity Kit:

- Start with right-most port on each controller (port 0) for the first NVR.
- Proceed in order from right to left (ports 1, 2, and 3) for each NVR you add.

The image below shows a transceiver installed into controller port 0 to connect the first NVR.



Prepare the Network Switch to be Connected

If you are connecting to the Video Archive using the 2 network switch SAN option, follow the instructions that came with your switches to prepare them to be connected to the NVRs and Video Archive.

Make sure that your switches meet the requirements outlined in *Minimum Network Switch Requirements* on page 5.

Connecting the System Components

Naming and Connecting the NVR NIC Ports

Important: If your NVR has any 10G NICs that are not being used for the Avigilon Video Archive connection, they should be disabled before completing this step. For example, if your NVR has a 10G NIC that is used to connect to the camera or corporate network, it should be disabled prior to configuring the network adapters and then re-enabled once the Video Archive setup is complete. Failure to disable these NICs may result in the incorrect NIC being configured to use the Avigilon Video Archive.

To ensure that the Video Archive and NVR connection is made correctly, it is recommended to assign names to the NIC ports being used on the NVRs so the Video Archive will use them in the correct order. Follow these steps to name the two NIC ports on each NVR being connected to the Video Archive:

Tip: To avoid connection issues, the NIC ports on the NVR should be named so they are the first ports in the list if they are listed alphabetically. In this setup we recommend using *AVA Connection A* and *AVA Connection B* for the names. Be sure that whatever name you choose will be listed first alphabetically.

1. Connect Controller A on the Video Archive to the left-side port of the NVR's CNA/SAN card.

   Note:
   Refer to the following sections for Video Archive and NVR connection diagrams:
   - Direct connection: *Direct Connection Cabling* on the next page
   - Network switch connection: *Network Switch Connection Cabling* on page 20

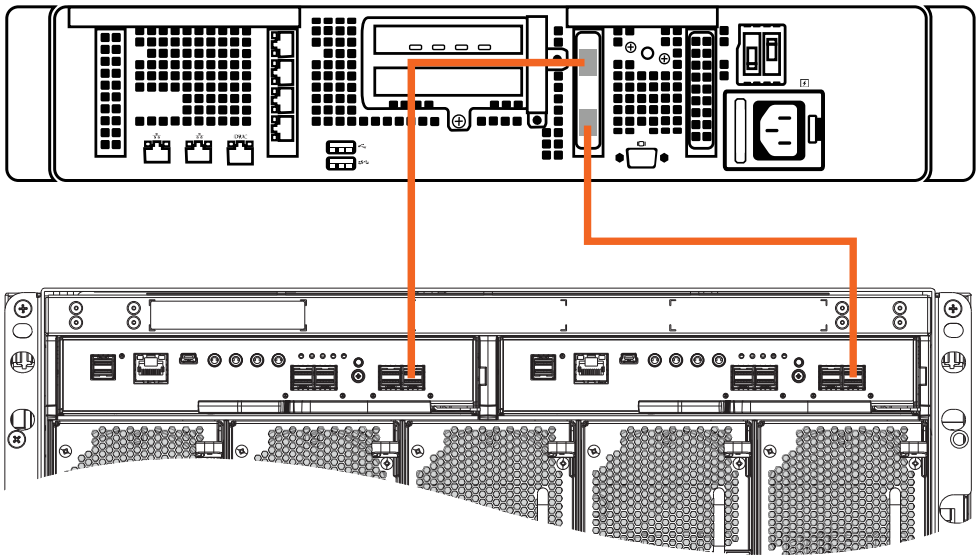
2. In the NVR's operating system, one of the NIC ports will show as enabled or active. Rename this active NIC port to `AVA Connection A` or a similar name that will be the first alphabetically out of all the NIC ports.
3. Connect Controller B on the Video Archive to the right-side port of the NVR's CNA/SAN card.
4. In the operating system, the second port will now show as enabled or active. Rename this active NIC port to `AVA Connection B` or similar name that will be the second after the first renamed port above.
5. Repeat this step for all of the NVRs that you are connecting to the Avigilon Video Archive.

Direct Connection Cabling

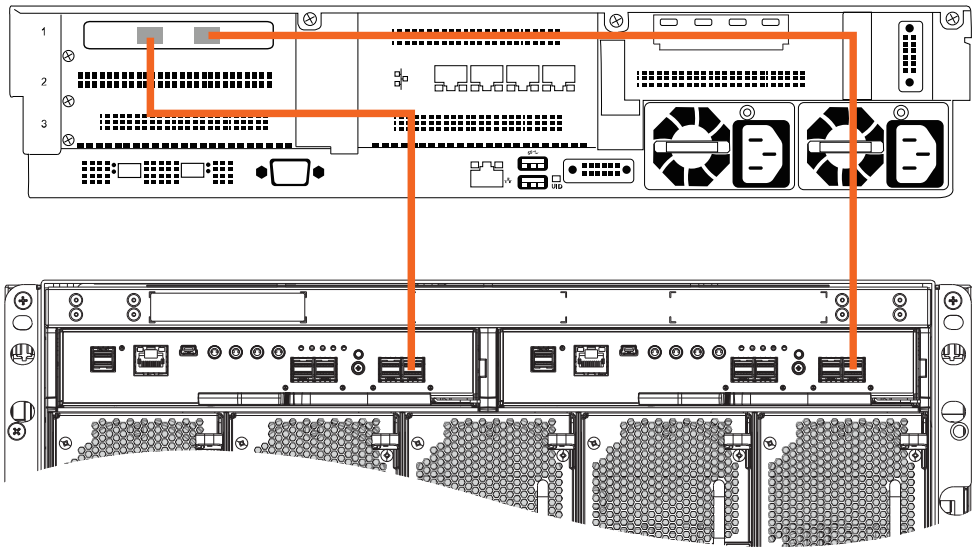
Connect each NVR to the Video Archive with an orange optical cable. There are two optical cables and two 10G SFP+ transceivers included in each Connectivity Kit.

The images below show how to directly connect the first supported NVRs to controller port 0 on the Video Archive head unit. Connect the first NVR to controller port 0, then connect the second NVR to controller port 1, the third NVR to controller port 2, and the final NVR to controller port 3.

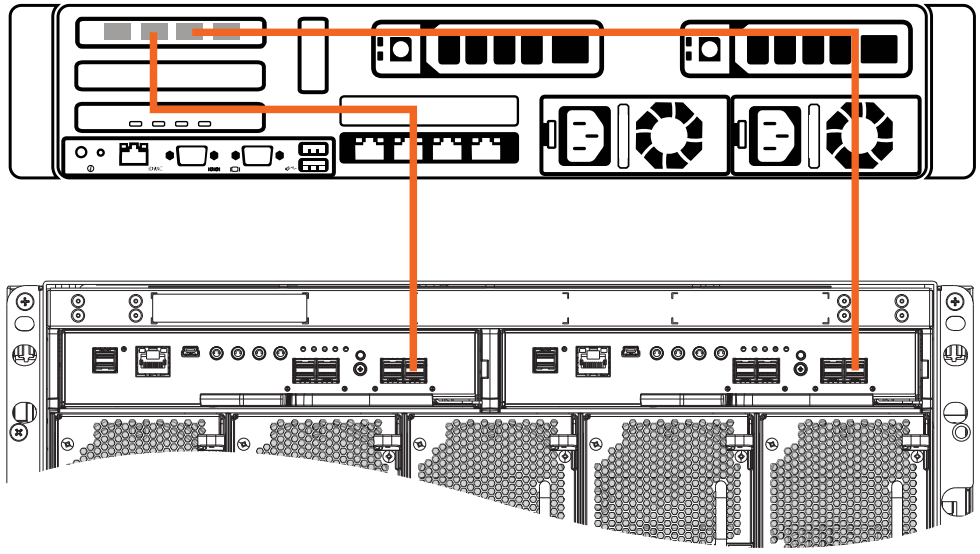
NVR5 STD



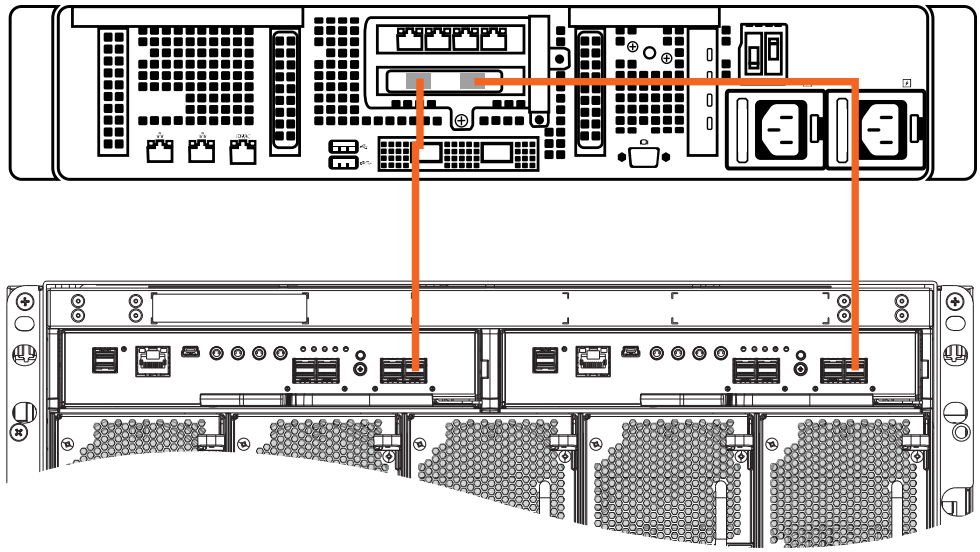
NVR5 PRM 252/288/360/432 TB



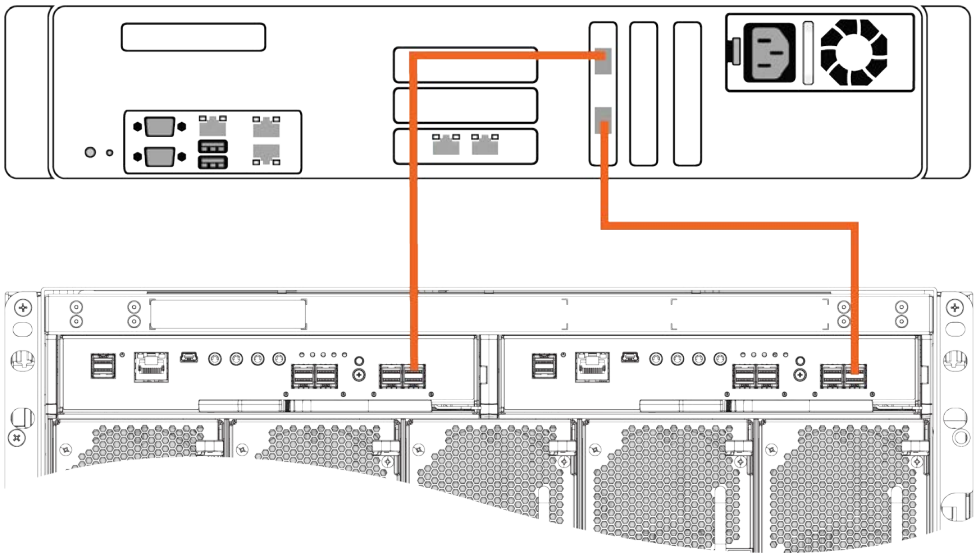
NVR5 PRM 192/224 TB



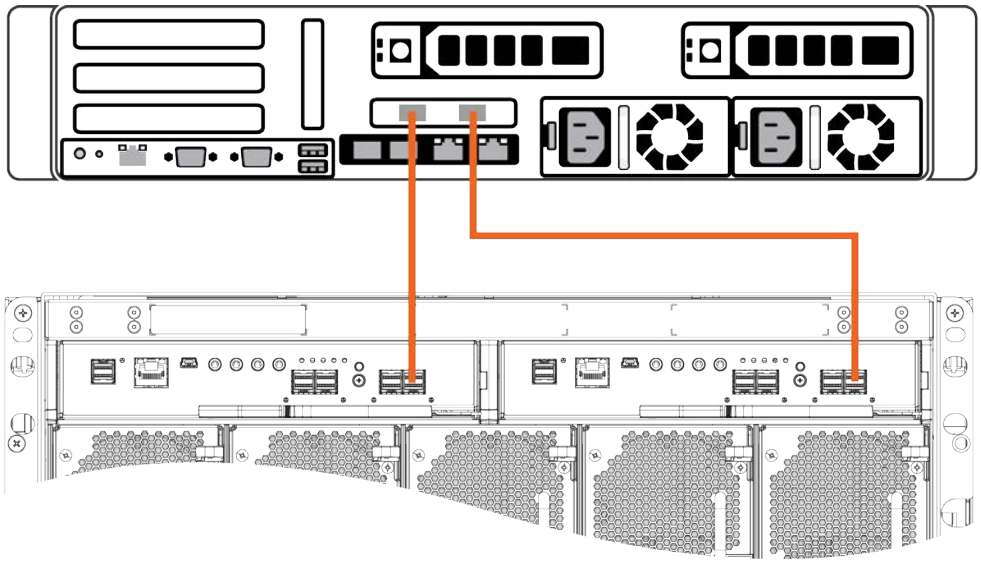
NVR5 PRM 96/128/160 TB



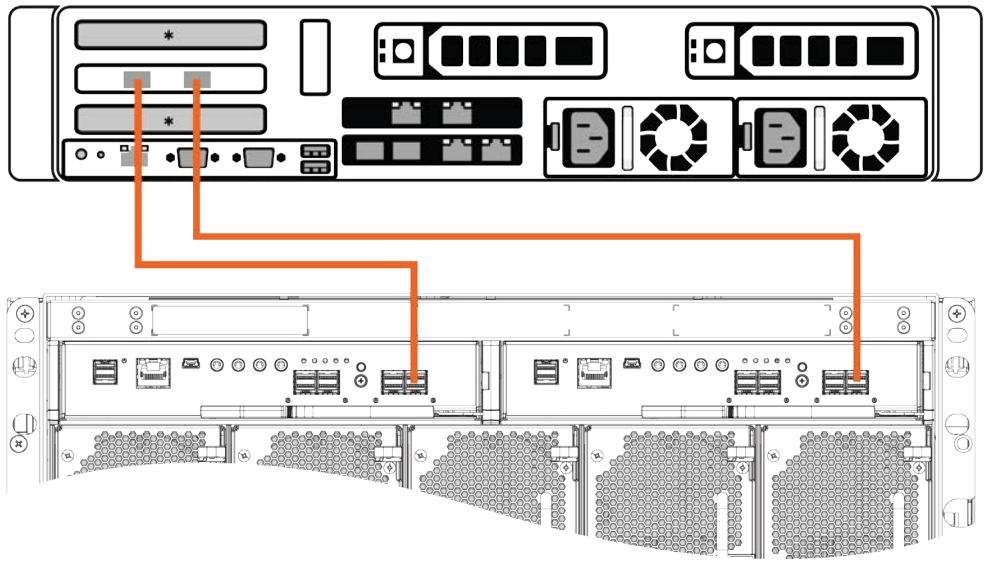
NVR4 STD, NVR4X STD, and NVR4X PRM 64/96/128/157 TB



NVR4 PRM



NVR4X PRM 192/217 TB



Network Switch Connection Cabling

Connect Switches to the Video Archive

Connect Uplink ports from each network switch to controller A and controller B on the Video Archive with 4 optical cables. All 4 optical cables from each switch will connect to one of the controllers. Connect the 4 ports on controller A to switch A Uplink ports and then connect the 4 ports on controller B to switch B.

The transceivers and optical cables needed to connect the Avigilon Video Archive to the network switches are sold separately in pairs of one (AVA-SAN-CONNECT-1) or eight (AVA-SAN-CONNECT-8) transceivers and optical cables.

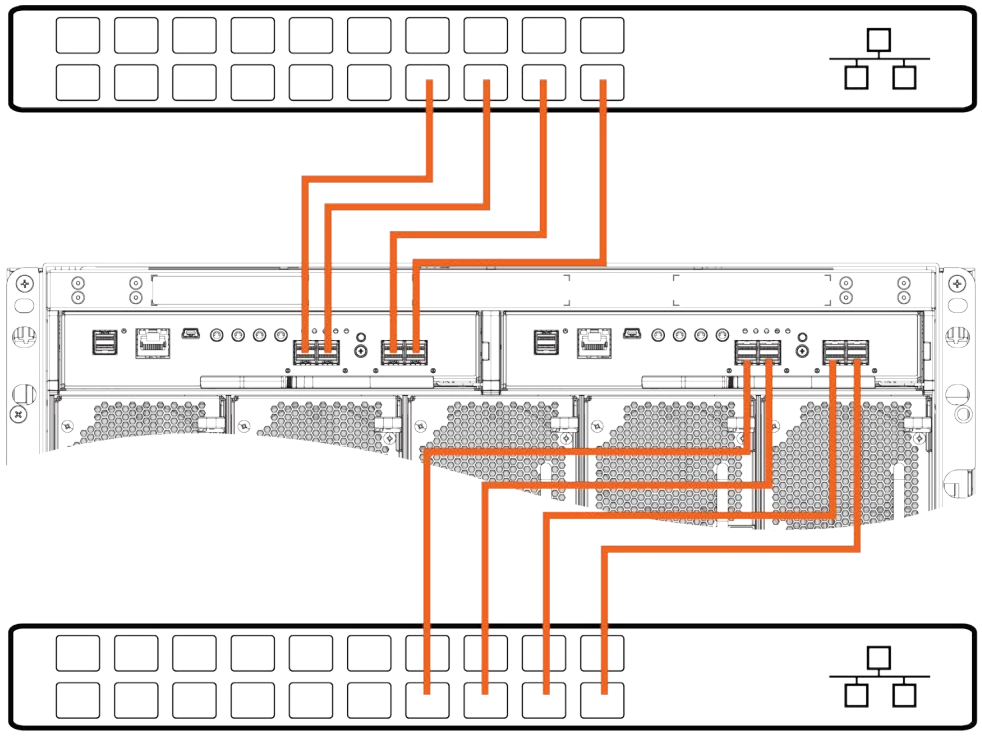


Figure 11: Connect network switch Uplink ports to the Video Archive

Connect NVRs to the Switches

Connect the each NVR to switch A and switch B with an orange optical cable. There are two optical cables included in each NVR Connectivity Kit.

The images below show how to connect the supported NVRs to the network switches. Connect up to 12 NVRs to the network switches.

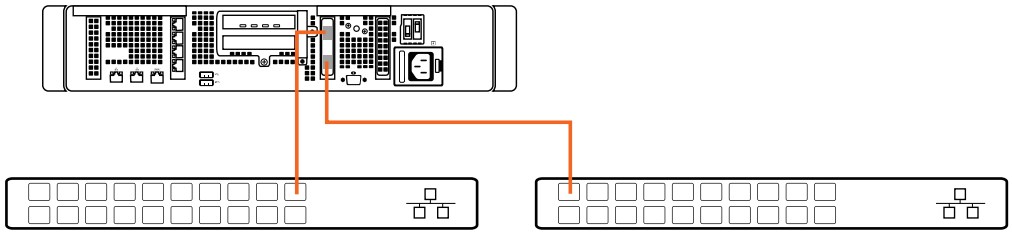


Figure 12: Connect an NVR5 STD to the network switches

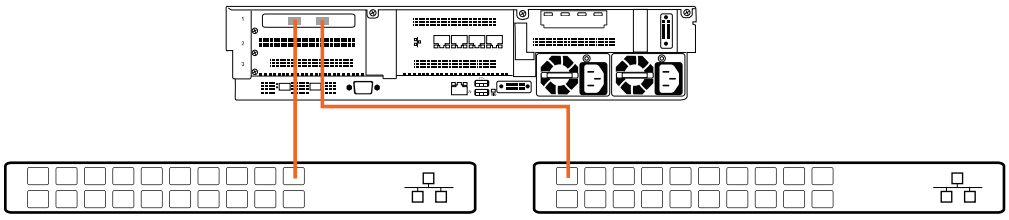


Figure 13: Connect an NVR5 PRM 252/288/360/432 TB to the network switches

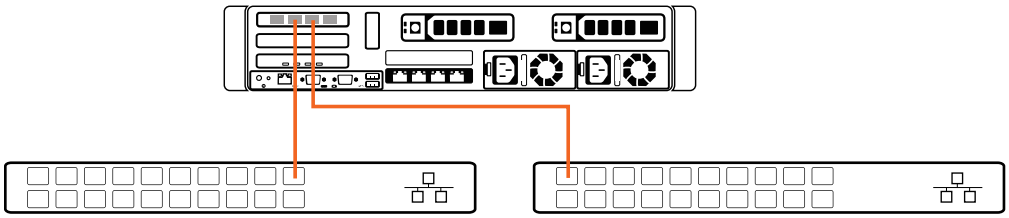


Figure 14: Connect an NVR5 PRM 192/224 TB to the network switches

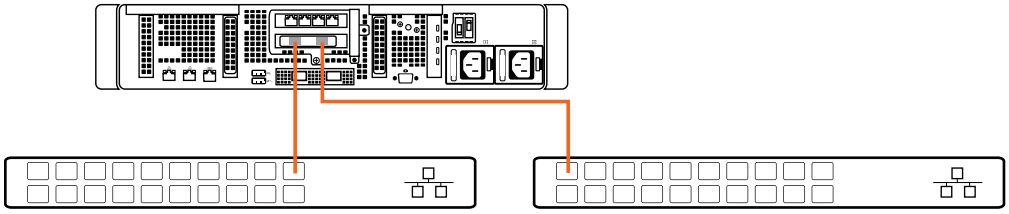


Figure 15: Connect an NVR5 PRM 96/128/160 TB to the network switches

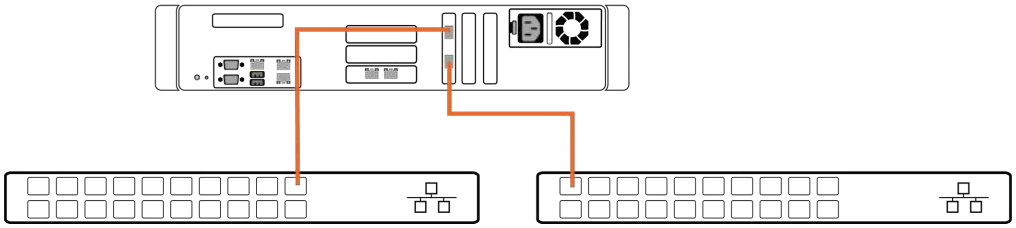


Figure 16: Connect an NVR4 STD, NVR4X STD, or NVR4X PRM 64/96/128/157 TB to the network switches

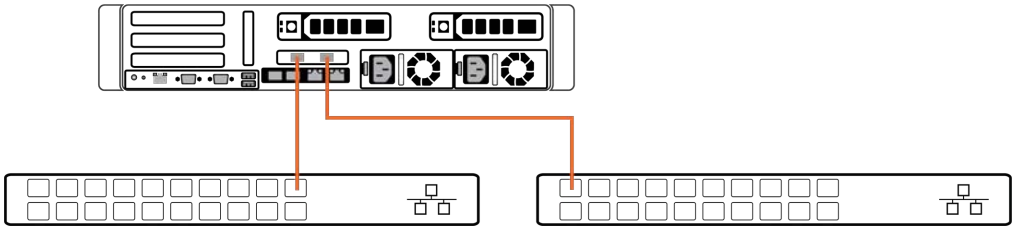


Figure 17: Connect an NVR4 PRM to the network switches

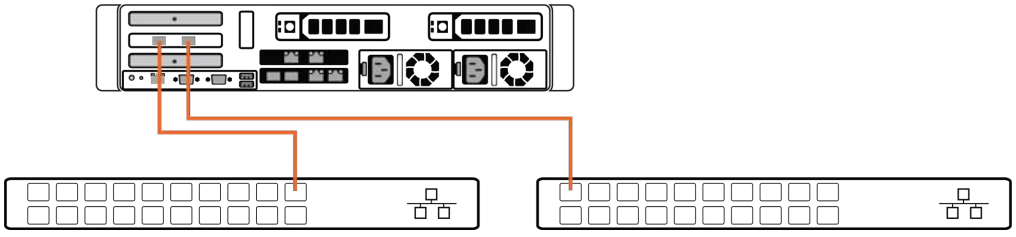


Figure 18: Connect an NVR4X PRM 192/217 TB to the network switches

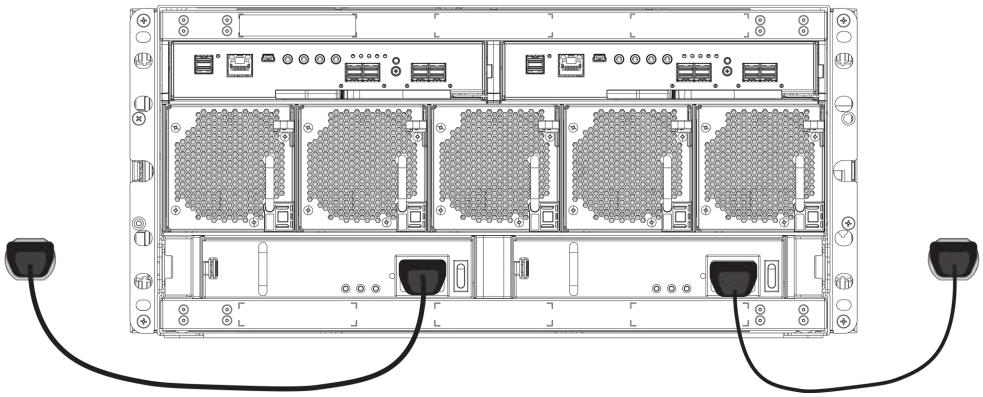
Power the Equipment

Connect power cables to all of your equipment. When powering on, ensure the units and associated NVRs are powered on in the following order:

- Power on any network switches (if used), routers, or other standalone components.
- Power on the expansion unit, if present.
- Power on the head unit.
- Power on the NVRs (if powered down to install the Connectivity or 2nd CPU kits).

After the head unit is powered on, the Power on/Standby LED on the head unit Ops panel turns green.

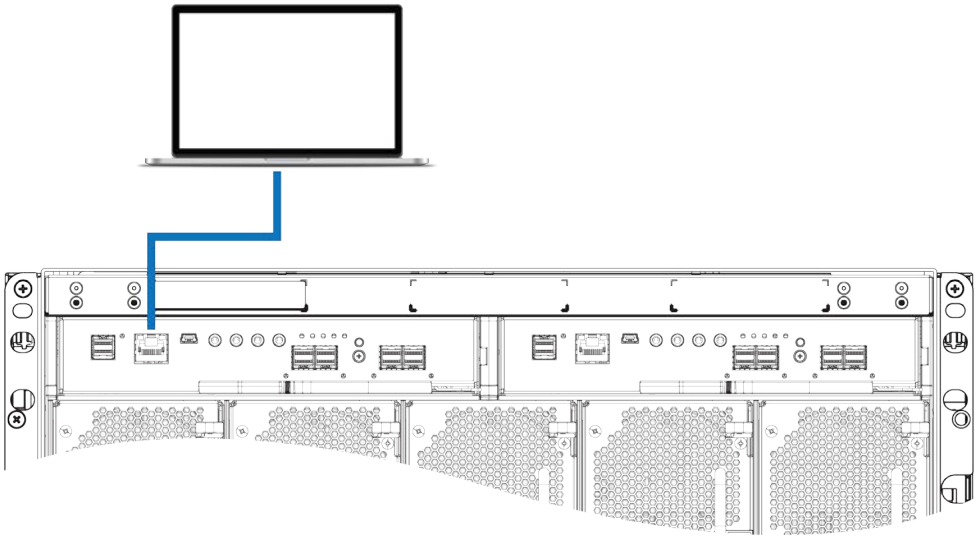
Important: A Video Archive unit requires 220V power and C20 or NEMA power plugs.



Connect a Laptop to the Video Archive

Connect a laptop to the **Controller A management port** on the Video Archive to access the management interface.

1. Connect an RJ45 Ethernet cable to the Management Port on the controller.
2. Connect the other end of the Ethernet cable to a laptop computer.



Next Steps to Deploy the Video Archive

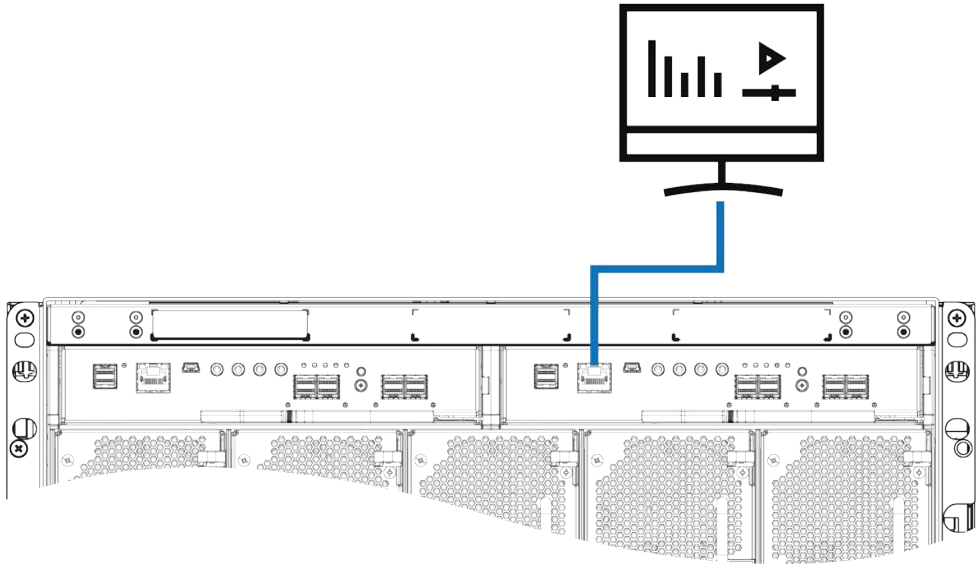
Initialize the Storage

Access the Video Archive head unit from the laptop connected to the Controller A management port to perform system initialization.

> **Tip:** Refer to the **Video Archive Initialization Guide** for instructions to complete the system initialization.

Connect to the ACC Client Network

After completing system initialization, connect the Controller B management port to the ACC Client network to receive notifications, SNMP traps, and support data.



For More Information

For additional product documentation and software and firmware upgrades, visit **support.avigilon.com**.

Technical Support

Contact Avigilon Technical Support at **support.avigilon.com/s/contactsupport**.

Avigilon Video Archive Initialization Tools and documentation is also available from **avigilon.com/products/video-infrastructure/video-archive**.