Server installation guide

AWS Outposts

AWS Outposts: Server installation guide

Table of Contents

Installing an AWS Outposts server

When you order an Outposts server, you are responsible for installing the server. You can install the server yourself or contract a third party. The party installing the server must have specific permissions to verify the identity of the new device.

Prerequisites

You must have an Outposts server at your site. For more information, see [Site requirements](#) in this guide, and [Create an Outpost and order capacity](#) in the *AWS Outposts User Guide for Outposts servers*.

Tasks

1. [Grant permissions](#) to install the Outposts server
2. [Inspect](#) the Outposts server equipment
3. (Optional) [Mount the Outposts server](#) in a rack
4. [Connect the power source](#) and verify power
5. [Connect the Outposts server](#) to your network
6. [Configure connection and authorize the server](#)

> ⓘ **Tip**
>
> We recommend that you view the [Installing AWS Outposts Servers](#) training video before and during the installation process. To access the training, you must sign in or create an account on [AWS Skill Builder](#).

Step 1: Grant permissions to install the Outposts server

To verify the identity of the new device, you must have IAM credentials in the AWS account that contains the Outpost. The AWS OutpostsAuthorizeServerPolicy policy grants the permissions required to install an Outposts server. For more information, see Identity and access management (IAM) for AWS Outposts in the *AWS Outposts user guide for servers*.

Considerations

- If you are using a third party that does not have access to your AWS account, you must provide temporary access.

- AWS Outposts supports using temporary credentials. You can configure temporary credentials that last up to 36 hours. Ensure that you give the installer enough time to perform all the steps for server installation. For more information, see Using temporary credentials with AWS Outposts in the *AWS Outposts User Guide for Outposts servers*.

Step 2: Inspect the Outposts server equipment

To complete an inspection of the Outposts equipment, you should check the shipping package for damage, unpack the shipping package, and locate the Nitro Security Key (NSK). Consider the following information when inspecting the server:

- The shipping package has shock sensors located on the two largest sides of the box.
- The inside flap of the shipping package contains instructions about how to unpack the server and locate the NSK.
- The NSK is an encryption module. To complete inspection, you *locate* the NSK. You attach the NSK to the server in a later step.

Tasks

- [Check the shipping package](#)
- [Unpack the shipping package](#)
- [Find the NSK](#)

Check the shipping package

Before opening your package, conduct brief visual inspection of the shipping carton for any signs of external damage. If packaging is intact, units may be installed with confidence. Minor cosmetic marks are acceptable and do not indicate functional damage.

Server Arrival Shipping Package Inspection Checklist:

- Inspect for dents, bends or deformed edges
- Inspect all sides for any punctures or tears
- Look for any signs of moisture ingress or if arrived in wet or soaked condition
- If any of the above physical damage is identified, contact AWS Support for guidance on replacing your Outposts server

Unpack the shipping package

Open the package and ensure it contains the following items:

- Server

- Nitro Security Key (encryption module) – packaging marked with "NSK" in red. See the following procedure for locating the NSK from the shipping package for more information.

- Rack installation kit (2 inner rails, 2 outer rails, and screws)

- Installation pamphlet

- Accessory kit

  - Pair of C13/14 power cables - 10 feet (3m)

  - QSFP breakout cable -10 feet (3m)

  - USB cable, micro-USB to USB-C - 10 feet (3m)

  - Brush guard

Find the NSK

The NSK is inside the box labelled **A** that includes the accessories for the server.

> ⚠️ **Important**
>
>   - Do not use the NSK to destroy data on the server during installation.
>
>   - NSKs are not interchangeable between servers. You must use the NSK from the box the sever came in. If you have multiple servers, ensure that the correct NSK is attached to each server.
>
>   If you use the wrong NSK, it will cause the provisioning process to fail until the correct NSK is attached to the server and the authorize-server process repeated.

The NSK is required to activate the server. The NSK is also used to destroy data on the server when you send the server back. In this installation step, **ignore** the instructions on the body of the NSK because those instructions are to destroy data.

Step 3: (Optional) Mount your Outposts server in a rack

To complete this step, you must attach inner rails to the server, outer rails to the rack, then mount the server on the rack. You need a Phillips-head screwdriver to complete these steps.

Rack mount alternatives

You are not required to mount the server in a rack. If you're not mounting the server in a rack, consider the following information:

- Ensure a minimum clearance of 6 inches (15 cm) between the server and walls in front of and behind the server to allow the hot air to circulate.

- Place the server on a stable surface free from mechanical hazards such as moisture or falling objects.

- To use the networking cables included with the server, you must place the server within 10 feet (3 m) of your upstream networking device.

- Follow local guidance for seismic bracing and bonding.

Tasks

- [Identify sides and ends](#)
- [Attach inner rails](#)
- [Attach outer rails](#)
- [Mount the server](#)

Identify sides and ends

Locate and open the box of rack rails that came with the server. Use the following procedure to identify the sides and ends of the rails.

To identify left from right, front from back

1. Look at the markings on the rails to determine which is left and right. These markings determine to which side of the server each rail gets attached.
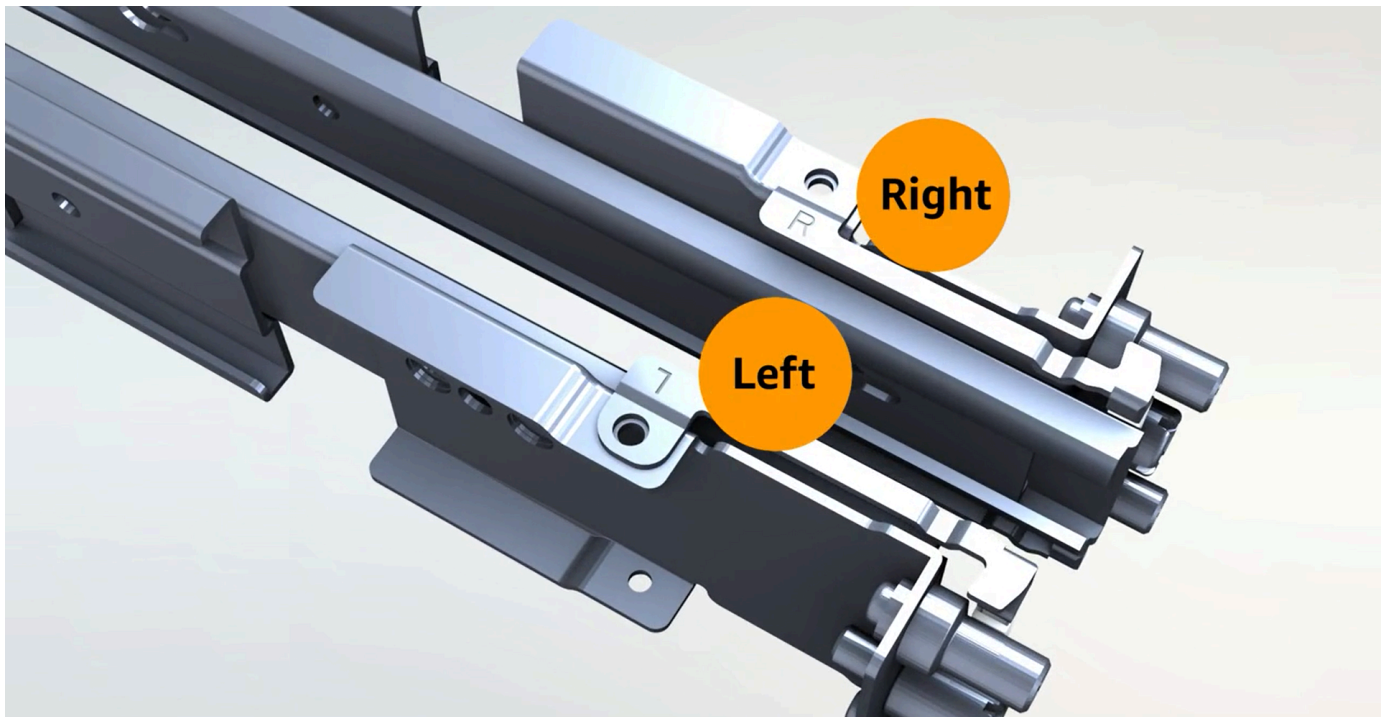
2.   Look at the posts on each end of the rails to determine which is front, and which is back.

The front end has three posts.
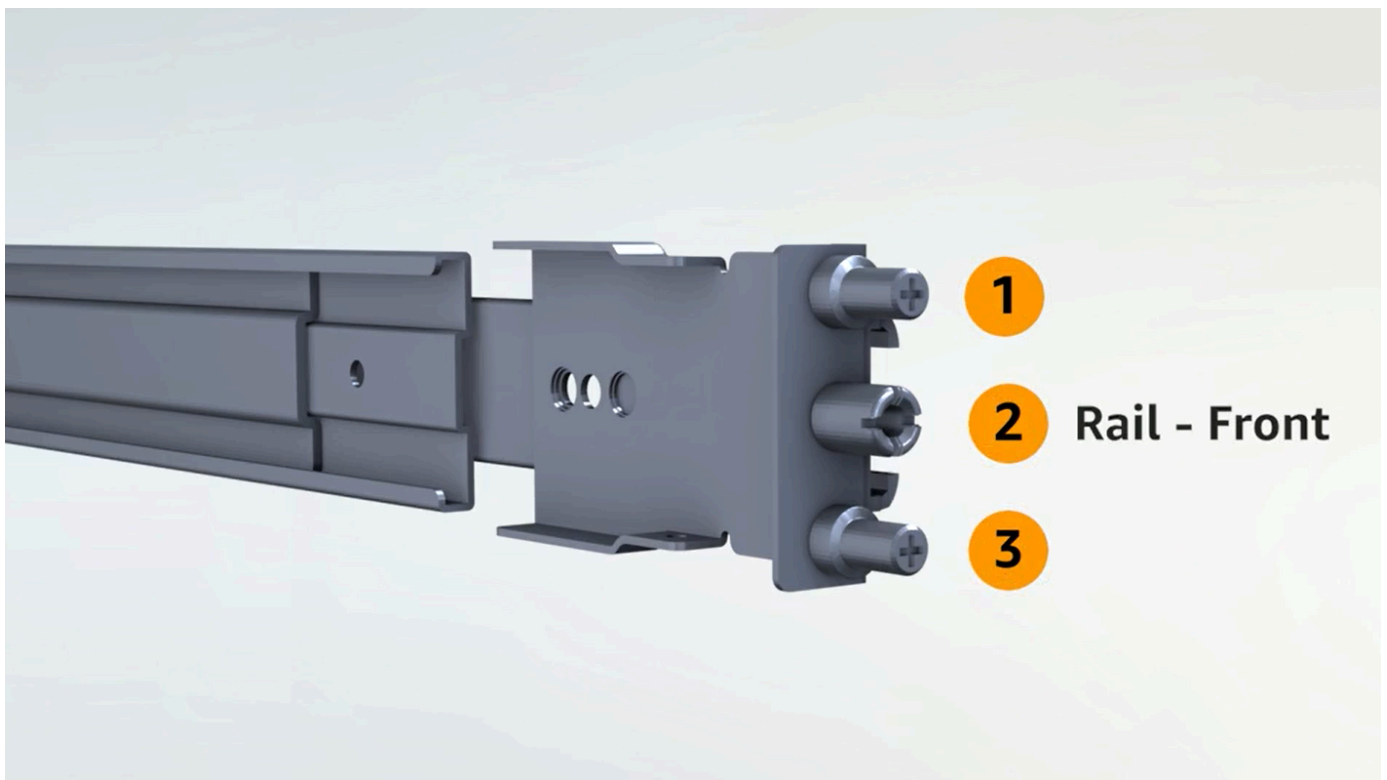
The back end has two posts.
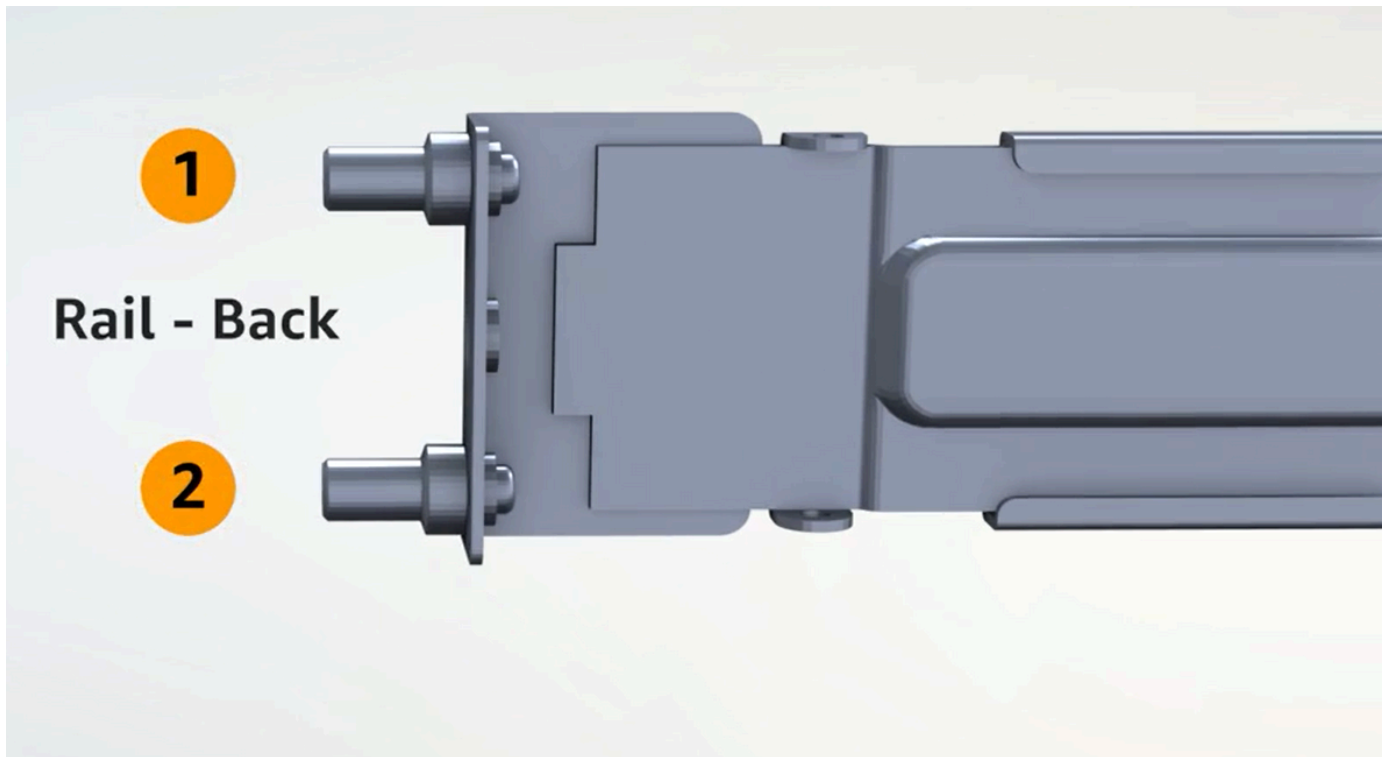
Attach inner rails

Use the following procedure to attach the inner rails to the server.

To attach inner rails to the server

1. Detach the inner rail from the outer rail for both rails. You should have four rails.

2. Attach the right inner rail to the right side of the server and secure the rail with a screw. Make sure you orient the rail correctly with the server. Point the front part of the rail toward the front of the server.

3. Attach the left inner rail to the left side of the server and secure the rail with a screw.

Attach outer rails

To attach outer rails to the rack, face the rack and use the rail marked R on the right side of the rack. Attach the back of the rail to the rack first, then extend the rail to connect it to the front of the rack.

> ℹ️ **Tip**
>
> Pay attention to the orientation of the rails. Use included pin adapters if necessary.

Repeat with the left rail on the left side.

Mount the server

To mount the server in the rack, slide the server into the outer rails you installed on the rack in the previous step and secure the server at the front with two provided screws.

> ℹ️ **Note**
>
> - Use two people to slide the server into the rack.
> - Do not mount the server vertically.

Step 4: Connect the power source and verify power to your Outposts server

To complete power up, you attach the NSK, connect the server to a power source, and verify that the server has powered on. Consider the following information about powering the server:

- The server functions with one power source, but AWS recommends you use two power sources for redundancy.

- Connect the power cables before you connect the network cables.

- Use the pair of C13 outlet/C14 inlet power cables to connect the server to a power supply on the rack. If you're not using the C14 inlet power cable to connect the server to a power supply on the rack, you must provide adapters for the C14 inlets that connect to a power source.

Tasks

- Attach the NSK to your Outposts server
- Connect the power source and verify power to your Outposts server
- Check the Power LED on the Atlas 3.0. NSK

Attach the NSK to your Outposts server

You must attach the NSK to the server so it can decrypt data on the server during operation.

> ⚠ **Important**
>
> - The side of the NSK has instructions on how to destroy the NSK. Do not follow those instructions now. Follow those instructions only when returning the server to AWS, to cryptographically shred the data on the server.
>
> - If you are installing multiple servers at the same time, ensure that you do not mix up the NSKs. You must attach the NSK to the server that it shipped with. If you use a different NSK, the server will not boot up.

To attach the NSK

1. On the front right side of the server, open the NSK compartment.

    The following image shows the NSK attached to a 2U server.

    The following image shows the NSK attached to a 1U server.
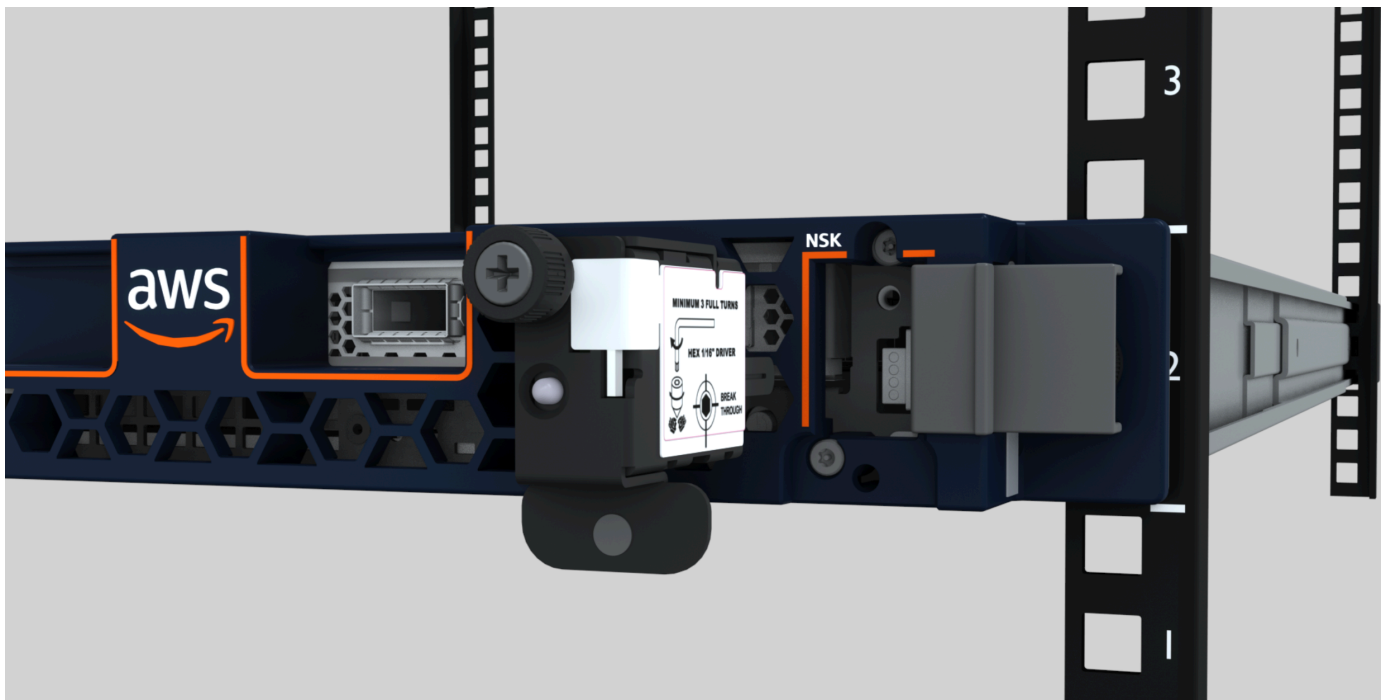
2. Ensure that the serial number (SN) on the NSK matches the SN on the bezel pull-out tab of the NSK compartment on the server.

    The following image shows the SN number on the NSK and bezel pull-out tab:

3. Fit the NSK into the slot.

4. Hand tighten using the thumbscrew or tighten with a screwdriver (0.7 Nm / 0.52 lb-ft) until snug. Do not use power tool as it might over-torque and damage the NSK.

The following image shows the location of the thumbscrew.

NSK thumbscrew
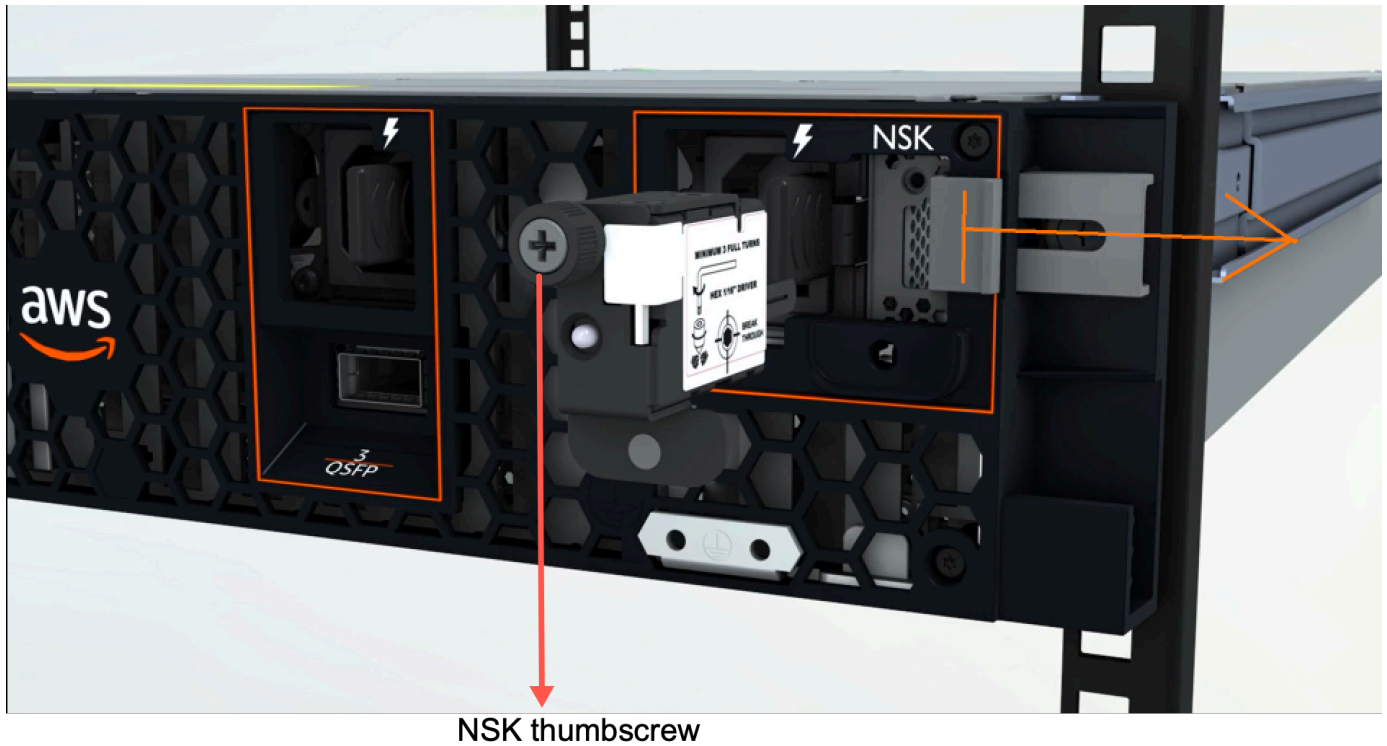
The following image shows the type of screwdriver you can use to attach the NSK to the server.

Connect the power source and verify power to your Outposts server

Use the following procedures to connect your Outposts server to its power source and then verify that the server has powered on.

To connect the server to power

1. Locate the pair of C13/C14 power cables that came with the server.

2. Connect the C14 end of both cables to your power source.

3. Connect the C13 end of both cables to the ports on the front of the server.

To verify that the server has power

1. Verify that you can hear the server running.

    > ⓘ **Tip**
    >
    > The noise level goes down after the server provisions itself.

2. Verify that the LED power lights above the power ports are lit.

    The following image shows the LED power lights on a 2U server

The following image shows the LED power lights on a 1U server

Check the Power LED on the Atlas 3.0. NSK

AWS Outposts supports two versions of NSK: Atlas 2.0 and Atlas 3.0. Both NSK versions have a RGB **Status** LED. In addition, the Atlas 3.0 has a green **Power** LED. This step is only for the Atlas 3.0 NSK.

The following image shows the location of the LEDs on the Atlas 2.0 and Atlas 3.0 NSKs:

Atlas 3.0   Atlas 2.0
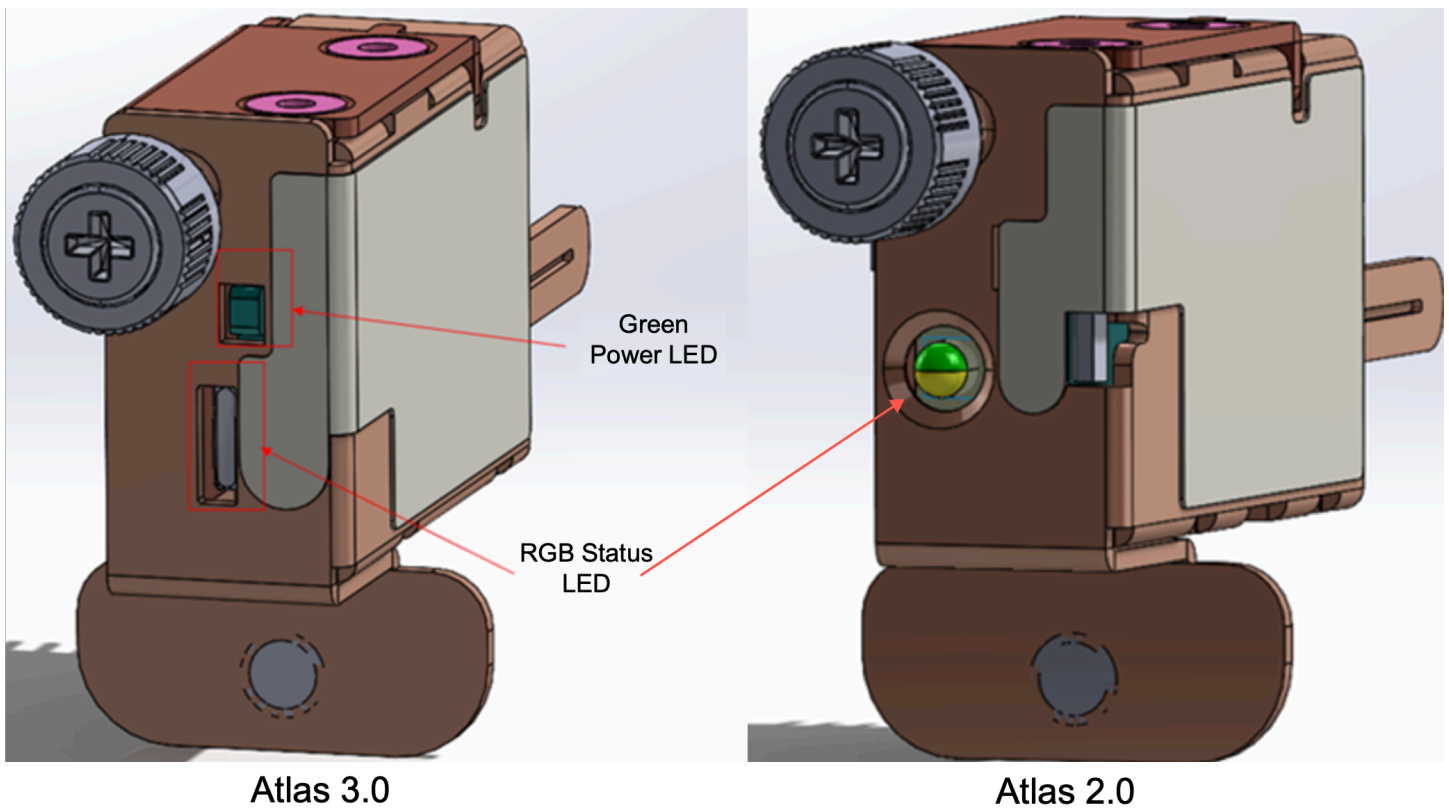
If you have the Atlas 2.0 NSK, skip to the next step, Step 5: Connect your Outposts server to your network because this version of the NSK only has the RGB Status LED which you must check after the Outposts server is provisioned and activated.

If you have the Atlas 3.0 NSK, check the green Power LED:

- If the green light is on, the NSK is correctly connected to the host and has power. You can proceed to the next step.
- If the green light is off, the NSK is not correctly connected to the host or/and has no power. Contact Support.

Step 5: Connect your Outposts server to your network

To complete the network setup, you connect the server to your upstream networking device with network cable.

Consider the following information about connecting to the network:

- The server requires connections for two types of traffic: service link traffic and local network interface (LNI) link traffic. The instructions in the following section describe which ports to use on the server to segment traffic. Consult with your IT group to determine which port on your upstream networking device should carry each type of traffic.

- Ensure the server has connected to your upstream networking device and has been assigned an IP address. For more information, see Server IP address assignment in the *AWS Outposts User guide for servers*.

- The optical connection on an AWS Outposts server only supports 10 Gbits and does not support auto-negotiation of port speed. If the host port tries to negotiate port speed, for example, between 10 through 25 Gbits, you can run into problems. In such cases, we recommend you do the following:

    - Set the port speed on the switch port to 10 Gbits.

    - Work with your switch vendor to support a static configuration.

Tasks

- Configure the QSFP network for your Outposts server

Configure the QSFP network for your Outposts server

With the QSFP breakout cable, you use breakouts to segment traffic.

The following image shows the QSFP breakout cable:

> **ⓘ Note**
>
> AWS Outposts servers have a physical RJ45 port beside the QSFP port. However, this RJ45 port is not enabled for any customer use. If you require RJ45 1GbE connectivity, use the included QSFP cable to connect a 10GBASE-X SFP+ to a 1GbE RJ45 media converter.

One end of the QSFP cable has a single connector. Connect this end to the server.

The following image shows the end of the cable with the single connector:
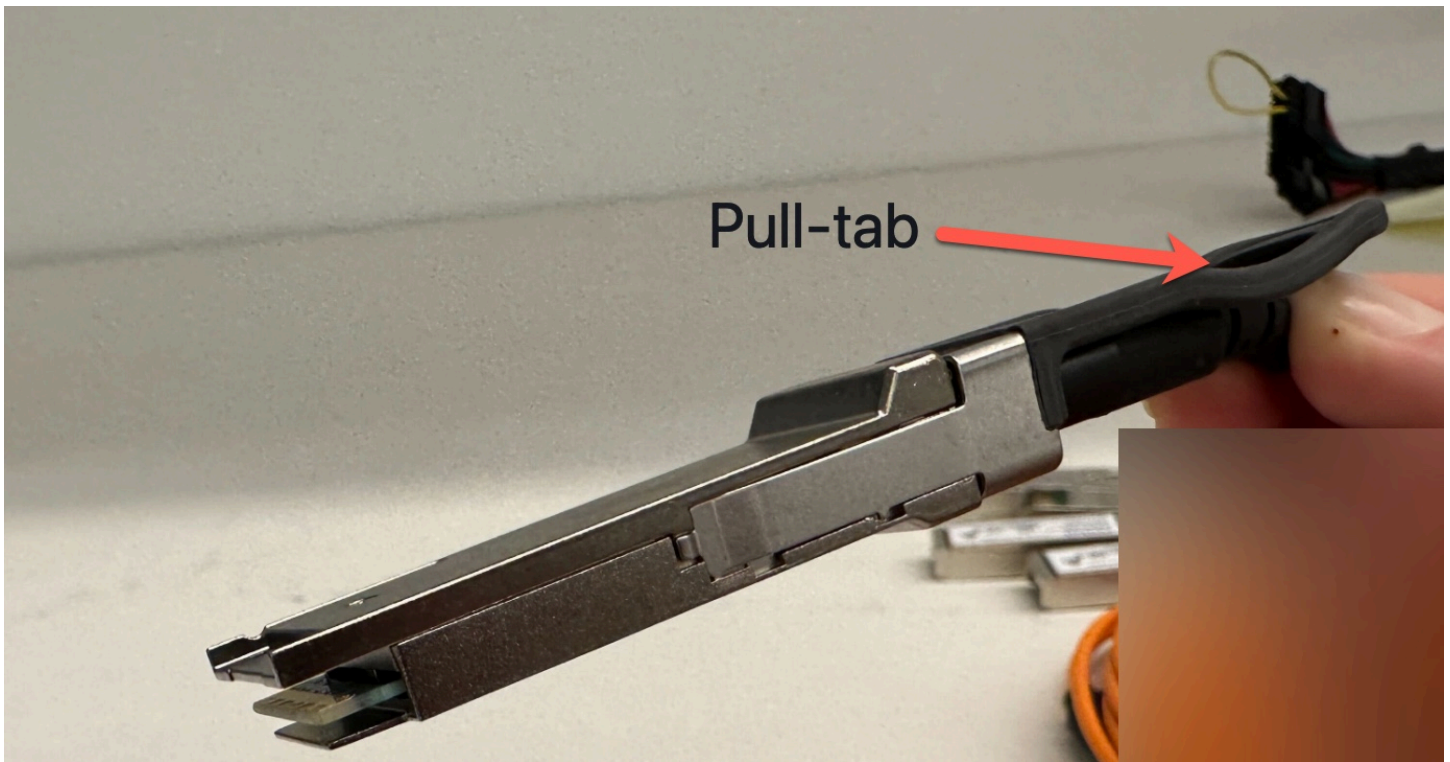
The other end of the QSFP cable has 4 breakout cables labeled 1 through 4. Use the cable labeled 1 for LNI link traffic and the cable labeled 2 for service link traffic.

The following image shows the end of the cable with the 4 breakout cables:

To connect the server to the network with the QSFP breakout cable

1. Locate the QSFP breakout cable that came with the server.

2. Connect the single end of the QSFP breakout cable to the QSFP port on the server.

    1. Locate the QSFP port.

       The following image shows the location of the QSFP port on the 2U server.

The following image shows the location of the QSFP port on the 1U server.

2. Plug in the QSFP with the pull-tab in the correct orientation.

For the 2U server, plug in the QSFP with the pull-tab on top as the following image shows.
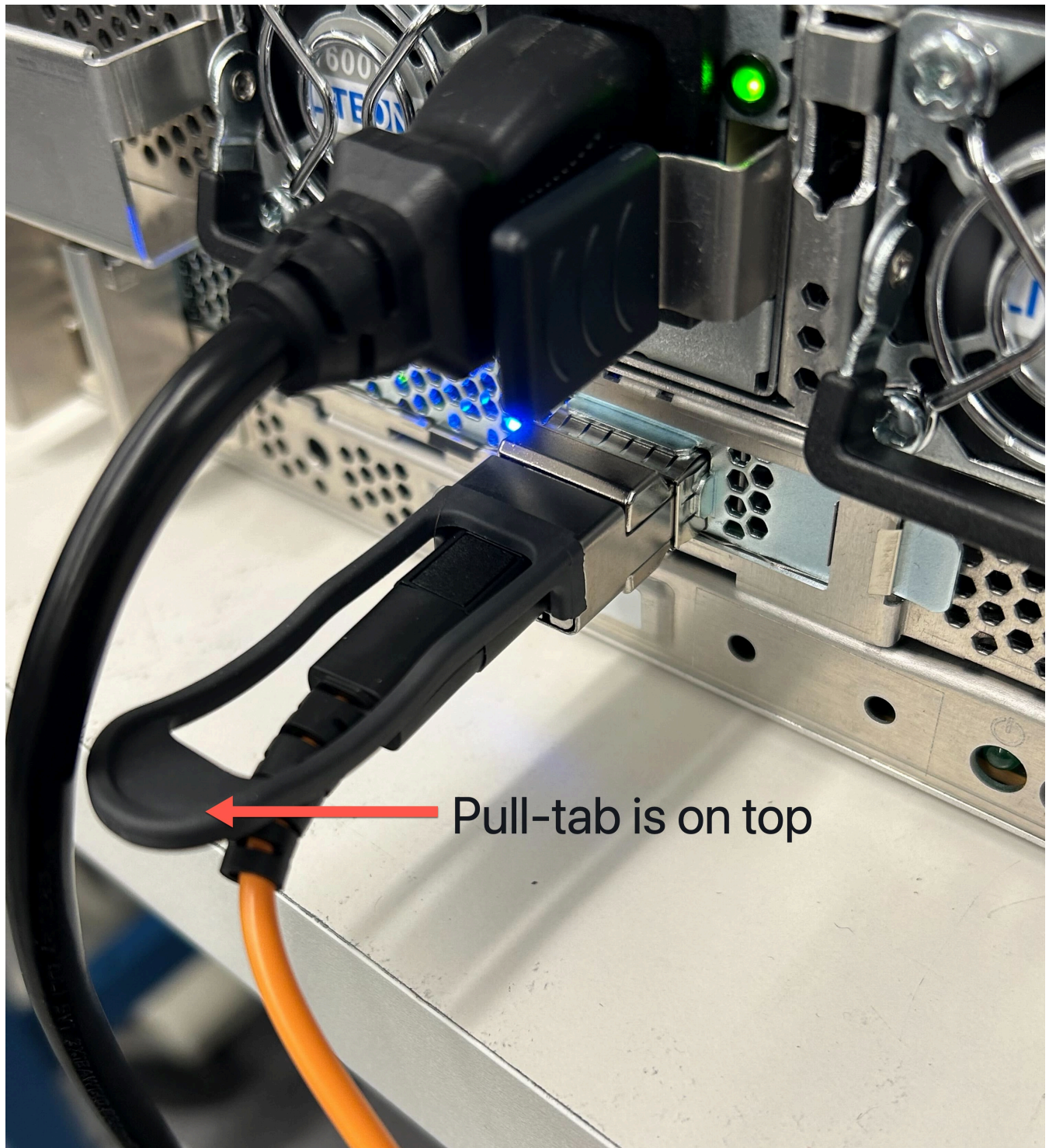
For the 1U server, plug in the QSFP with the pull-tab on the bottom as the following image shows.

Pull-tab is on bottom
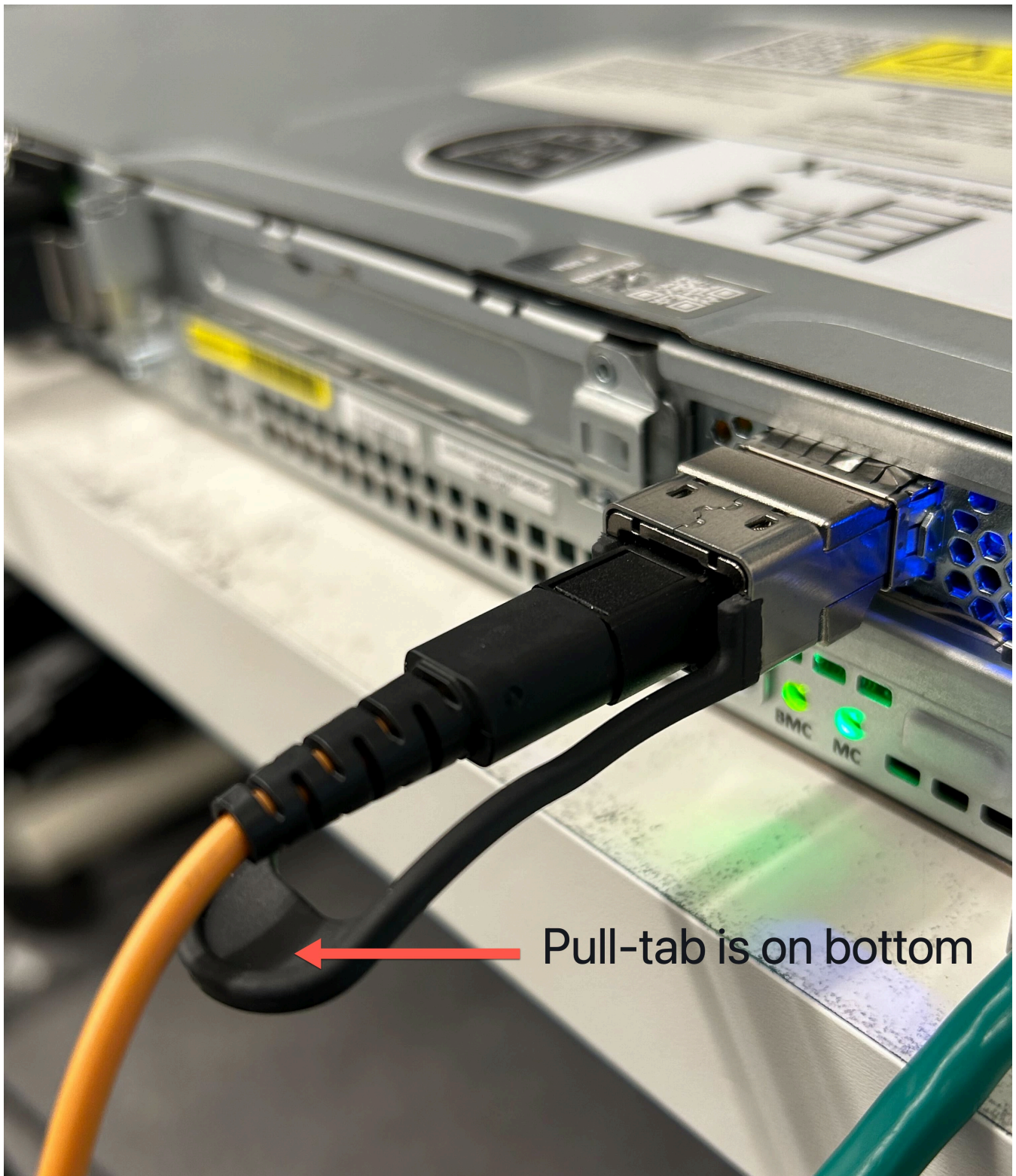
3. Ensure that you feel or hear a click when you plug the cables in. This indicates that you
   plugged in the cables correctly.

3. Connect breakouts 1 and 2 of the QSFP cable to the upstream networking device.

> ⚠️ **Important**
>
> Both of the following cables are required for an Outposts server to function.
>
> - Use the cable labeled 1 for LNI link traffic.
> - Use the cable labeled 2 for service link traffic.

Step 6: Configure connection and authorize your Outposts server

To authorize the server, you must connect your laptop to the server with a USB cable, then use a command-based serial protocol to test the connection and authorize the server. In addition to IAM credentials, you need a USB cable, a laptop, and serial terminal software, such as PuTTY or **screen**, to complete these steps.

Consider the following information about authorizing the server:

- To authorize the server, you or the party installing the server needs IAM credentials in the AWS account that contains the Outpost. For more information, see *Step 1: Grant permissions*.
- You do not need to authenticate with the IAM credentials to test your connection.
- Consider testing the connection before you use the export command to set IAM credentials as environment variables.
- To protect your account, Outpost Configuration Tool never saves your IAM credentials.
- To connect your laptop to the server, always plug the USB cable into your laptop first and then into the server.

Tasks

- Connect your laptop to the Outposts server
- Create a serial connection to the Outposts server
- Configure and test the Outposts server connection to AWS
- Authorize the Outposts server using the Outpost Configuration Tool
- Verify the NSK LEDs for your Outposts server

Connect your laptop to the Outposts server

Connect the USB cable to your laptop first and then to the server. The server includes a USB chip that creates a virtual serial port available to you on the laptop. You can use this virtual serial port to connect to the server with serial terminal emulation software. You can only use this virtual serial port to run Outpost Configuration Tool commands.

To connect the laptop to the server

Plug the USB cable into your laptop first, then into the server.

> ⓘ **Note**
>
> The USB chip requires drivers to create the virtual serial port. Your operating system should automatically install the required drivers if they are not already present. To download and install the drivers, see Installation Guides from FTDI.

Create a serial connection to the Outposts server

The following are instructions to create a serial connection from your laptop to the Outposts server. They use popular serial terminal programs. You are not required to use these programs. You can use the serial terminal program that you prefer, if it supports a connection speed of 115200 baud.

Examples

- Windows serial connection
- Mac serial connection

Windows serial connection

The following instructions are for PuTTY on Windows. PuTTY is free, but you may have to download it.

Download PuTTY

Download and install PuTTY from the PuTTY download page.

To create a serial terminal on Windows using PuTTY

1. Plug the USB cable into your Windows laptop first, then into the server.

2. From the Desktop, right-click **Start**, and choose **Device Manager**.

3. In **Device Manager**, expand **Ports (COM & LPT)** to determine the COM port for the USB serial connection. You will see a node named **USB Serial Port (COM#)**. The value for the COM port depends on your hardware.
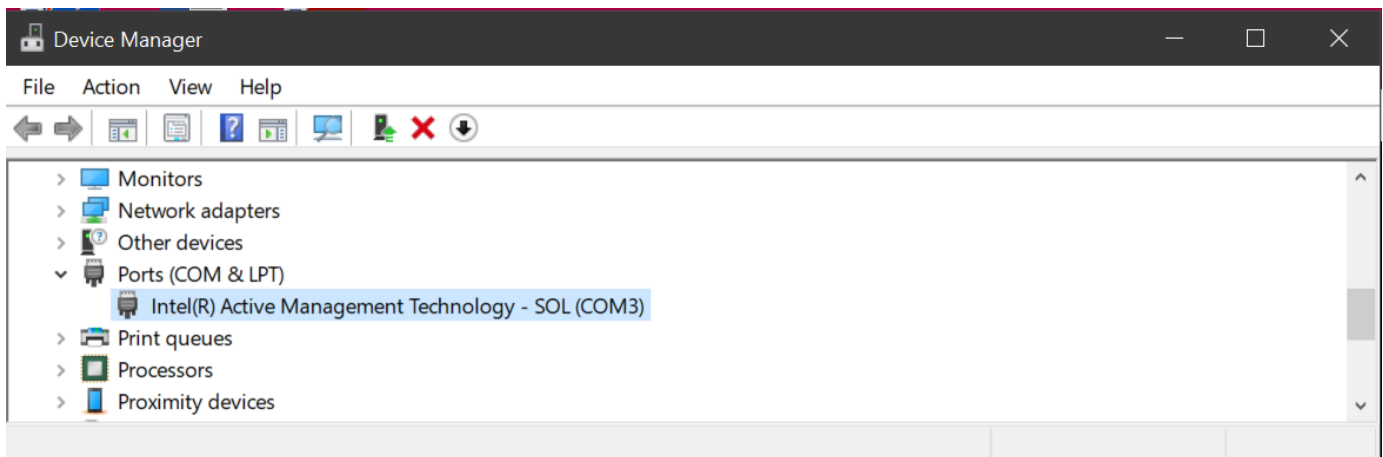
4. In PuTTY, from **Session**, choose **Serial** for **Connection type**, and then enter the following information:

    - Under **Serial line**, enter the COM# port from Device Manager.

    - Under **Speed**, enter: 115200

    The following image shows an example on the **PuTTY Configuration** page:
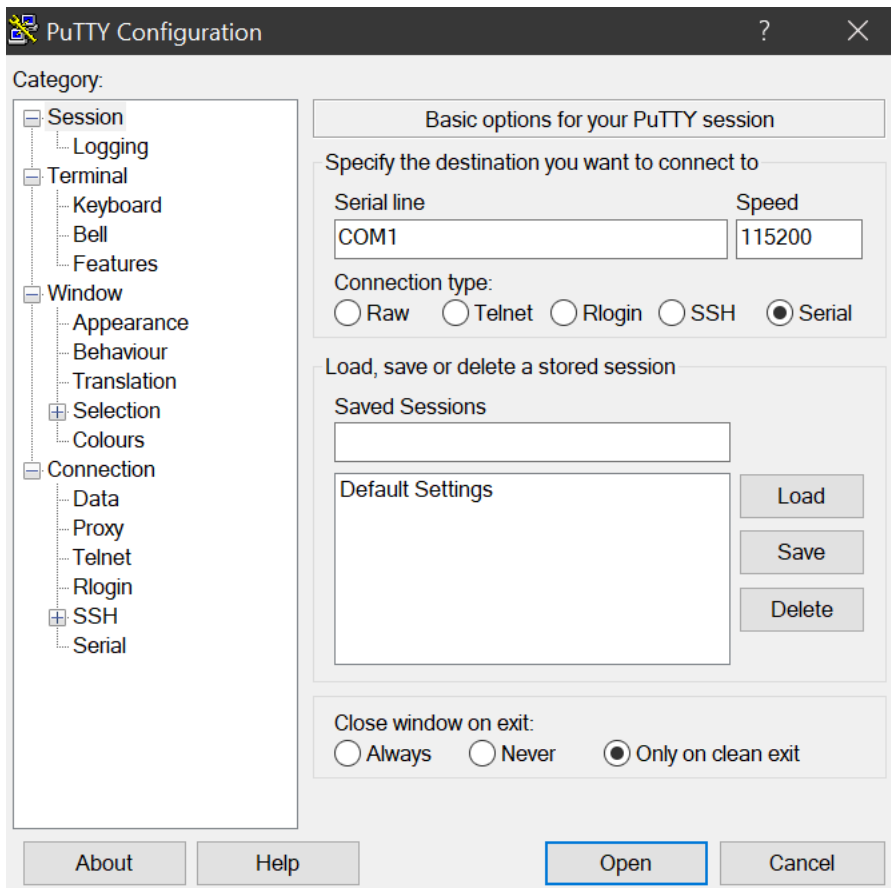
5. Choose **Open**.

An empty console window appears. It can take between 1 to 2 minutes for one of the following to appear:

- `Please wait for the system to stabilize. This can take up to 900 seconds, so far` *x seconds* `have elapsed on this boot.`

- The `Outpost>` prompt.

Mac serial connection

The following instructions are for **screen** on macOS. You can find **screen** included with the operating system.

To create a serial terminal on macOS using screen

1. Plug the USB cable into your Mac laptop first, then into the server.

2. In Terminal, list /dev with a *usb* filter for output to find the virtual serial port.

```
ls -ltr /dev/*usb*
```

The serial device appears as `tty`. For example, consider the following sample output from the previous list command:

```
ls -ltr /dev/*usb*
crw-rw-rw-  1 root  wheel   21,    3 Feb  8 15:48 /dev/cu.usbserial-EXAMPLE1
crw-rw-rw-  1 root  wheel   21,    2 Feb  9 08:56 /dev/tty.usbserial-EXAMPLE1
```

3. In Terminal, use **screen** with the serial device and a baud rate of the serial connection to set up the serial connection. In the following command, replace *EXAMPLE1* with the value from your laptop.

```
screen /dev/tty.usbserial-EXAMPLE1 115200
```

An empty console window appears. It can take between 1 to 2 minutes for one of the following to appear:

- Please wait for the system to stabilize. This can take up to 900 seconds, so far *x seconds* have elapsed on this boot.
- The `Outpost>` prompt.

Configure and test the Outposts server connection to AWS

Use the following procedures to configure and test the connection between your server and AWS using the Outpost Configuration Tool. You don't need IAM credentials to test the connection. Your connection must resolve DNS to access the AWS Region.

Before you begin, ensure the following prerequisites:

1. Your laptop is connected to the Outposts server through the USB cable as described in Connect your laptop.

2. You created a serial connection to the server as described in Create a serial connection.

3. You see the `Outpost` prompt.

Tasks

- Configure static networking
- Test the links
- Test for DNS resolution
- Test for access to the AWS Region

Configure static networking

> ⓘ **Note**
>
> If you are using Dynamic Host Configuration Protocol (DHCP) for IP address configuration, skip this step.

Configure your Outposts server's service link and DNS (Domain Name Server) IP addresses statically.

To configure static IP and DNS addresses

1. From the Outpost prompt, you can run **help** to see the possible commands.

2. Set the static IP using **set-service-link-static-ip**. You will need the following arguments to run this command: the IP, subnet mask, and gateway.

   Run: **set-service-link-static-ip** *ip netmask gateway*

   Example

   For example, **set-service-link-static-ip** *192.168.1.2 255.255.255.0 192.168.1.1* sets the static IP to 192.168.1.2, the netmask to 255.255.255.0, and the gateway to 192.168.1.1.

3. Set the DNS address using **set-dns**. This command requires one argument, the DNS address.

   Run: **set-dns** *dns*

   Example

   For example, **set-dns** *8.8.8.8* sets the DNS address to 8.8.8.8.

4. Optional. To verify that all values are correct, use **get-service-link-static-ip** and **get-dns** to display the values set in the previous two steps.

5. Reboot the server for the static IP to take effect.

   Run: **reboot**

6. When the server comes back online it should be using the static IP. To verify:

   a. Create the serial connection to the server as described in [Create a serial connection](#). The Outpost> prompt appears.

   b. From the Outpost> prompt, run **describe-ip**.

   In the information that appears, you should see mode: static along with the statically configured values for IP, netmask, gateway, and DNS.

   Example

   ```
   Outpost>describe-ip
   ---
   ```

```
links:
-
  name: service_link
  configured: True
  mode: static
  ip: 192.168.1.2
  netmask: 255.255.255.0
  gateway: 192.168.1.1
  dns: [ "8.8.8.8" ]
  ntp: [ ]
checksum: 0xDB88E57A

...
```

Test the links

To test the links

1. Plug the USB cable into your laptop first and then into the server.

2. Use a serial terminal program, such as PuTTY or **screen**, to connect to the server. For more information, see the section called "Create a serial connection".

3. Press **Enter** to access the Outpost Configuration Tool command prompt.

   ```
   Outpost>
   ```

   > ⓘ **Note**
   >
   > If you see a persistent red light inside the chassis of the server on the left-hand side after you power on and you can't connect to Outpost Configuration Tool, you might need to power down and drain the server to proceed. To drain the server, disconnect all network and power cables, wait five minutes, then power up and connect to the network again.

4. Use **describe-links** to return information about the network links on the server. Outposts servers must have one service link and one local network interface (LNI) link.

   ```
   Outpost>describe-links
   ---
   service_link_connected: True
   ```

```
  local_link_connected: False
  links:
  -
    name: local_link
    connected: False
    mac: 00:00:00:00:00:00
  -
    name: service_link
    connected: True
    mac: 0A:DC:FE:D7:8E:1F
  checksum: 0x46FDC542
```

If you get `connected:  False` for either link, troubleshoot the network connection on the hardware.

5. Use **describe-ip** to return the IP assignment status and configuration of the service link.

```
Outpost>describe-ip
---
links:
-
  name: service_link
  configured: True
  ip: 192.168.0.0
  netmask: 255.255.0.0
  gateway: 192.168.1.1
  dns: [ "192.168.1.1" ]
  ntp: [ ]
checksum: 0x8411B47C
```

The NTP value might be missing as NTP is optional in a DHCP option set. You should have no other missing values.

Test for DNS resolution

To test for DNS

1. Plug the USB cable into your laptop first and then into the server.

2. Use a serial terminal program, such as PuTTY or **screen**, to connect to the server. For more information, see the section called "Create a serial connection".

3. Press **Enter** to access the Outpost Configuration Tool command prompt.

    ```
    Outpost>
    ```

    > ### ⓘ **Note**
    >
    > If you see a persistent red light inside the chassis of the server on the left-hand side
    > after you power on and you can't connect to Outpost Configuration Tool, you might
    > need to power down and drain the server to proceed. To drain the server, disconnect
    > all network and power cables, wait five minutes, then power up and connect to the
    > network again.

4. Use **export** to enter the parent Region of the Outposts server as the value for
    AWS_DEFAULT_REGION.

    AWS_DEFAULT_REGION=*Region*

    ```
    Outpost>export AWS_DEFAULT_REGION=us-west-2

    result: OK
    checksum: 0xB2A945RE
    ```

    - Do not include a space before or after the equal (=) sign.

    - No environment values are saved. You must export AWS Region each time you run Outpost
      Configuration Tool.

    - If you are using a third party to install the server, you must provide them with the parent
      Region.

5. Use **describe-resolve** to determine if the Outposts server can reach a DNS resolver and resolve
    the IP address of the Outpost configuration endpoint in the Region. Requires at least one link
    with an IP configuration.

    ```
    Outpost>describe-resolve
    ---
    dns_responding: True
    dns_resolving: True
    dns: [ "198.xx.xxx.xx", "198.xx.xxx.xx" ]
    query: outposts.us-west-2.amazonaws.com
    records: [ "18.xxx.xx.xxx", "44.xxx.xxx.xxx", "44.xxx.xxx.xxx" ]
    ```

```
checksum: 0xB6A961CE
```

Test for access to the AWS Region

To test access to AWS Regions

1. Plug the USB cable into your laptop first and then into the server.

2. Use a serial terminal program, such as PuTTY or **screen**, to connect to the server. For more information, see the section called "Create a serial connection".

3. Press **Enter** to access the Outpost Configuration Tool command prompt.

   ```
   Outpost>
   ```

   > ⓘ **Note**
   >
   > If you see a persistent red light inside the chassis of the server on the left-hand side after you power on and you can't connect to Outpost Configuration Tool, you might need to power down and drain the server to proceed. To drain the server, disconnect all network and power cables, wait five minutes, then power up and connect to the network again.

4. Use **export** to enter the parent Region of the Outposts server as the value for AWS_DEFAULT_REGION.

   AWS_DEFAULT_REGION=*Region*

   ```
   Outpost>export AWS_DEFAULT_REGION=us-west-2

   result: OK
   checksum: 0xB2A945RE
   ```

   - Do not include a space before or after the equal (=) sign.

   - No environment values are saved. You must export AWS Region each time you run Outpost Configuration Tool.

   - If you are using a third party to install the server, you must provide the them with the parent Region.

5. Use **describe-reachability** to determine if the Outposts server can reach the Outpost configuration endpoint in the Region. Requires a working DNS configuration, which you can determine by using **describe-resolve**.

```
Outpost>describe-reachability
---
is_reachable: True
src_ip: 10.0.0.0
dst_ip: 54.xx.x.xx
dst_port: xxx
checksum: 0xCB506615
```

- `is_reachable` indicates the outcome of the test

- `src_ip` is the IP address of the server

- `dst_ip` is the IP address of the Outpost configuration endpoint in the Region

- `dst_port` is the port the server used to connect to `dst_ip`

Authorize the Outposts server using the Outpost Configuration Tool

Use the following procedure to authorize the server. You need the Outpost Configuration Tool and the IAM credentials from the AWS account that owns the Outpost.

To authorize the server

1. Plug the USB cable into your laptop first and then into the server.

2. Use a serial terminal program, such as PuTTY or **screen**, to connect to the server. For more information, see the section called "Create a serial connection".

3. Press **Enter** to access the Outpost Configuration Tool command prompt.

```
Outpost>
```

> ⓘ **Note**
>
> If you see a persistent red light inside the chassis of the server on the left-hand side after you power on and you can't connect to Outpost Configuration Tool, you might

> need to power down and drain the server to proceed. To drain the server, disconnect all network and power cables, wait five minutes, then power up and connect to the network again.

4. Use **export** to enter your IAM credentials into Outpost Configuration Tool. If you are using a third party to install the server, you must provide them with the IAM credentials.

    To authenticate, you must export the following four variables. Export one variable at a time. Do not include a space before or after the equal (=) sign.

    - `AWS_ACCESS_KEY_ID=`*`access-key-id`*
    - `AWS_SECRET_ACCESS_KEY=`*`secret-access-key`*
    - `AWS_SESSION_TOKEN=`*`session-token`*
      - Use the AWS CLI `GetSessionToken` command to get the `AWS_SESSION_TOKEN`. For more information, see [get-session-token](#) in the *AWS CLI Command Reference*.

        > ⓘ **Note**
        >
        > You must have the [AWSOutpostsAuthorizeServerPolicy](#) attached to your IAM role to get the `AWS_SESSION_TOKEN`.

      - To install the AWS CLI, see [Installing or updating the latest version of the AWS CLI](#) in the *AWS CLI User Guide for Verrsion 2*.
    - `AWS_DEFAULT_REGION=`*`Region`*

    Use the parent Region of the Outposts server as the value for `AWS_DEFAULT_REGION`. If you are using a third party to install the server, you must provide them with the parent Region.

    The output in the following examples show successful exports.

    ```
    Outpost>export AWS_ACCESS_KEY_ID=AKIAIOSFODNN7EXAMPLE

    result: OK
    checksum: example-checksum
    ```

    ```
    Outpost>export AWS_SECRET_ACCESS_KEY=wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY
    ```

```
result: OK
checksum: example-checksum
```

```
Outpost>export AWS_SESSION_TOKEN=MIICiTCCAfICCQD6m7oRw0uXOjANBgk
VVMxCzAJBgNVBAgTAldBMRAwDgYDVQQHEwdTZWF0dGxlMQ8wDQYDVQQKEwZBbWF6
b24xFDASBgNVBAsTC0lBTSBDb25zb2xlMRIwEAYDVQQDEwlUZXN0Q2lsYWMxHzAd
BgkqhkiG9w0BCQEWEG5vb25lQGFtYXpvbi5jb20wHhcNMTEwNDI1MjA0NTIxWhcN
MTIwNDI0MjA0NTIxWjCBiDELMAkGA1UEBhMCVVMxCzAJBgNVBAgTAldBMRAwDgYD
VQQHEwdTZWF0dGxlMQ8wDQYDVQQKEwZBbWF6b24xFDASBgNVBAsTC0lBTSBDb25z
b2xlMRIwEAYDVQQDEwlUZXN0Q2lsYWMxHzAdBgkqhkiG9w0BCQEWEG5vb25lQGFt
YXpvbi5jb20wgZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBAMaK0dn+a4GmWIWJ
21uUSfwfEvySWtC2XADZ4nB+BLYgVIk60CpiwsZ3G93vUEIO3IyNoH/f0wYK8m9T
rDHudUZg3qX4waLG5M43q7Wgc/MbQITxOUSQv7c7ugFFDzQGBzZswY6786m86gpE
Ibb3OhjZnzcvQAaRHhdlQWIMm2nrAgMBAAEwDQYJKoZIhvcNAQEFBQADgYEAtCu4
nUhVVxYUntneD9+h8Mg9q6q+auNKyExzyLwaxlAoo7TJHidbtS4J5iNmZgXL0Fkb
FFBjvSfpJIlJ00zbhNYS5f6GuoEDmFJl0ZxBHjJnyp3780D8uTs7fLvjx79LjSTb
NYiytVbZPQUQ5Yaxu2jXnimvw3rrszlaEXAMPLE=

result: OK
checksum: example-checksum
```

```
Outpost>export AWS_DEFAULT_REGION=us-west-2

result: OK
checksum: example-checksum
```

5. Use **start-connection** to create a secure connection to the Region.

    The output in the following example shows a connection successfully started.

```
Outpost>start-connection

is_started: True
asset_id: example-asset-id
connection_id: example-connection-id
timestamp: 2021-10-01T23:30:26Z
checksum: example-checksum
```

6. Wait for about 5 minutes.

7. Use **get-connection** to check if the connection to the Region has been established.

    The output in the following example shows a successful connection.

```
Outpost>get-connection


---
keys_exchanged: True
connection_established: True
exchange_active: False
primary_peer: xx.xx.xx.xx:xxx
primary_status: success
primary_connection_id: a1b2c3d4567890abcdefEXAMPLE11111
primary_handshake_age: 1111111111
primary_server_public_key: AKIAIOSFODNN7EXAMPLE
primary_client_public_key: AKIAI44QH8DHBEXAMPLE
primary_server_endpoint: xx.xx.xx.xx:xxx
secondary_peer: xx.xxx.xx.xxx:xxx
secondary_status: success
secondary_connection_id: a1b2c3d4567890abcdefEXAMPLE22222
secondary_handshake_age: 1111111111
secondary_server_public_key: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY
secondary_client_public_key: je7MtGbClwBF/2Zp9Utk/h3yCo8nvbEXAMPLEKEY
secondary_server_endpoint: xx.xxx.xx.xxx:xxx
timestamp: 2023-02-22T22:19:28Z
checksum: 0x83FA0123
```

After `keys_exchanged` and `connection_established` changes to `True`, the Outposts server is automatically provisioned and updated to the latest software and configuration.

> ⓘ **Note**
>
> Note the following about the provisioning process:
>
> - After activation completes, it can take up to 10 hours until your Outposts server is usable.
>
> - You must keep the power and network for the Outposts server connected and stable during this process.
>
> - It is normal for the service link to fluctuate during this process.
>
> - If `exchange_active` is `True`, the connection is still establishing. Retry in 5 minutes.
>
> - If `keys_exchanged` or `connection_established` is `False`, and if `exchange_active` is `True`, the connection is still establishing. Retry in 5 minutes.

- If `keys_exchanged` or `connection_established` is `False` even after 1 hour, contact [AWS Support Center](#).

- If the message `primary_status: No such asset id found.` appears, confirm the following:

  - You specified the correct Region.

  - You are using the same account as the one used to order the Outposts server.

  If the Region is correct and you are using the same account as the one used to order the Outposts server, contact [AWS Support Center](#).

- The `LifeCycleStatus` attribute of the Outpost will transition from `Provisioning` to `Active`. You will then receive an email letting you know that your Outposts server is provisioned and activated.

- You don't need to re-authorize the Outposts server after it is activated.

8. After you make a successful connection, you can disconnect your laptop from the server.

Verify the NSK LEDs for your Outposts server

After the provisioning process completes, check the NSK LEDs.

AWS Outposts supports two versions of NSK: Atlas 2.0 and Atlas 3.0. Both NSK versions have a RGB **Status** LED. In addition, the Atlas 3.0 has a green **Power** LED.

The following image shows the location of the LEDs on the Atlas 2.0 and Atlas 3.0:

Atlas 3.0   Atlas 2.0
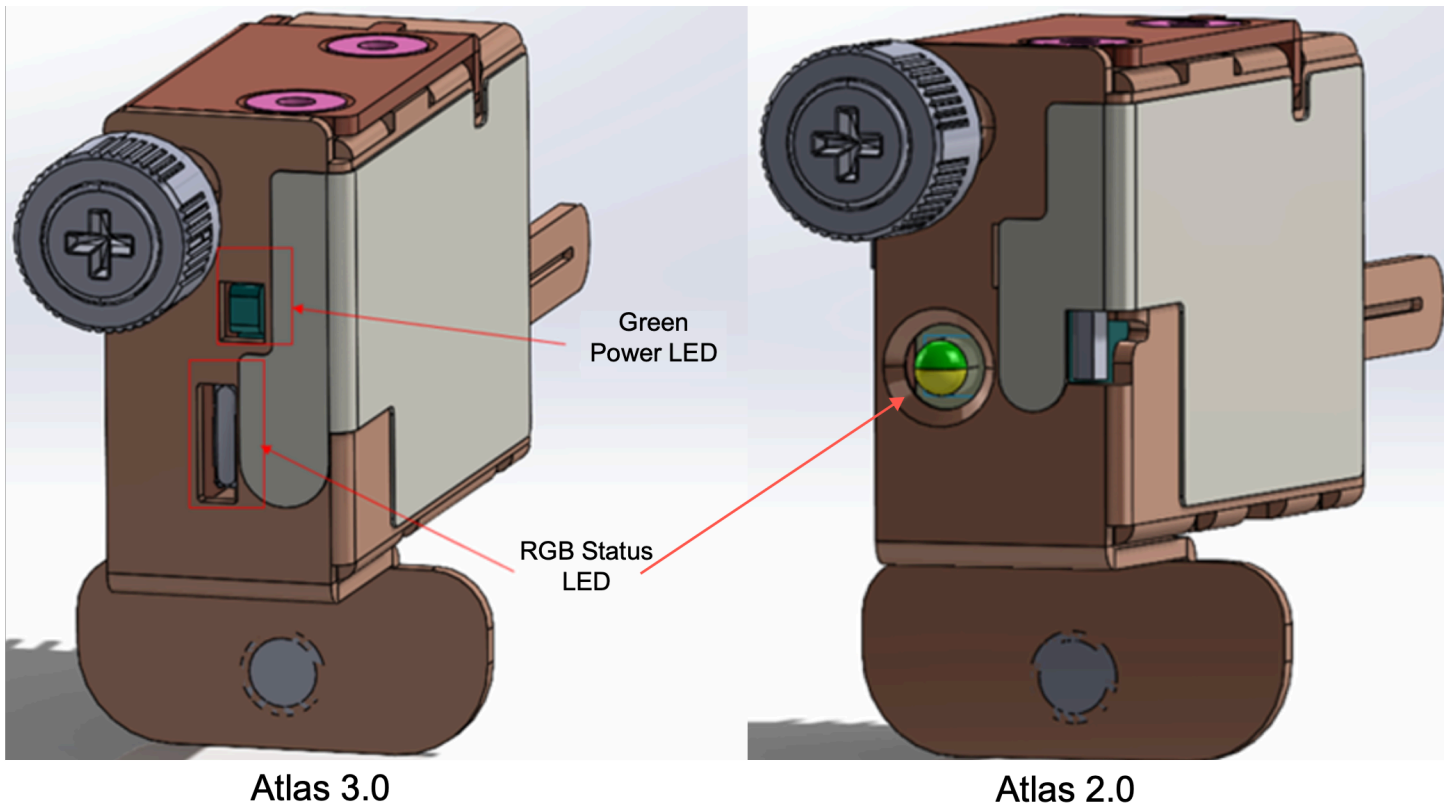
To verify the Status and Power LEDs on the NSK

1. Check the color of the RGB Status LED. If the color is green, the NSK is healthy. If the color is not green, contact Support.

2. If you have an Atlas 3.0 NSK, check the green Power LED. If the green light is on, the NSK is correctly connected to the host and has power. If the green light is not on, contact Support.

Outpost Configuration Tool command reference

Use the Outpost Configuration Tool to complete the installation process for your Outposts server. The Outpost Configuration Tool provides the following commands.

Commands

- [clear-dns](#)
- [clear-service-link-static-ip](#)
- [describe-ip](#)
- [describe-links](#)
- [describe-reachability](#)
- [describe-resolve](#)
- [echo](#)
- [export](#)
- [get-connection](#)
- [get-dns](#)
- [get-service-link-static-ip](#)
- [reboot](#)
- [set-dns](#)
- [set-service-link-static-ip](#)
- [start-connection](#)

clear-dns

The **clear-dns** command deletes the DNS (Domain Name Server) IP address. You must reboot the Outposts server for the configuration to apply.

Syntax

```
Outpost>clear-dns
```

Parameters

This command has no parameters.

Example output: Success

```
Outpost> clear-dns
---
success: True
```

clear-service-link-static-ip

The **clear-service-link-static-ip** command deletes the service link IP address. You must reboot the Outposts server for the IP address to be deleted. The IP will revert back to DHCP after the reboot.

Syntax

```
Outpost>clear-service-link-static-ip
```

Parameters

This command has no parameters.

Example output: Success

```
Outpost> clear-service-link-static-ip
---
success: True
```

describe-ip

The **describe-ip** command returns the IP assignment status and configuration of each connected link.

Syntax

```
Outpost>describe-ip
```

Parameters

This command has no parameters.

describe-links

The **describe-links** command returns information about the network links on the server. An Outposts server must have one service link and one local network interface (LNI) link.

Syntax

```
Outpost>describe-links
```

Parameters

This command has no parameters.

describe-reachability

The **describe-reachability** command determines whether the Outposts server can reach the Outpost configuration endpoint in the Region. It requires a working DNS configuration, which you can determine by using the section called "describe-resolve".

Syntax

```
Outpost>describe-reachability
```

Parameters

This command has no parameters.

describe-resolve

describe-resolve

The **describe-resolve** determines whether the Outposts server can reach a DNS resolver and resolve the IP address of the Outpost configuration endpoint in the Region. Requires at least one link with an IP configuration.

Syntax

```
Outpost>describe-resolve
```

Parameters

This command has no parameters.

echo

The **echo** command displays the value that you set for a variable using the [the section called "export"](#) command.

Syntax

```
Outpost>echo $variable-name
```

Parameters

This command takes a variable name. The valid values are:

- AWS_ACCESS_KEY_ID

- AWS_SECRET_ACCESS_KEY

- AWS_SESSION_TOKEN

- AWS_DEFAULT_REGION

Example: Success

```
Outpost>echo $AWS_DEFAULT_REGION

variable name: AWS_DEFAULT_REGION
variable value: us-west-2
checksum: checksum
```

Example: Failure because the variable value was not set using export

```
Outpost>echo $AWS_ACCESS_KEY_ID

error_type: execution_error
error_attributes:
  AWS_ACCESS_KEY_ID: no value set
error_message: No value set for AWS_ACCESS_KEY_ID using export.
```

```
checksum: checksum
```

Example: Failure because the variable name is not valid

```
Oupost>echo $bad_example

error_type: invalid_argument
error_attributes:
  bad_example: invalid variable name
error_message: Variables can only be AWS credentials.
checksum: checksum
```

Example: Failure because of a syntax issue

```
Outpost>echo AWS_SECRET_ACCESS_KEY

error_type: invalid_argument
error_attributes:
  AWS_SECRET_ACCESS_KEY: not a variable
error_message: Expecting $ before variable name.
checksum: checksum
```

export

The **export** command sets IAM credentials as environment variables. You must export the following
variables, one at a time. Do not include a space before or after the equal (=) sign.

Syntax

```
Outpost>export variable=value
```

Parameters

This command takes a variable assignment statement, *variable*=*value*. For example:

- AWS_ACCESS_KEY_ID=*access-key-id*

- AWS_SECRET_ACCESS_KEY=*secret-access-key*

- AWS_SESSION_TOKEN=*session-token*

- AWS_DEFAULT_REGION=*server-parent-Region*

Example output: Successful credential import

```
Outpost>export AWS_ACCESS_KEY_ID=AKIAIOSFODNN7EXAMPLE

result: OK
checksum: checksum
```

```
Outpost>export AWS_SECRET_ACCESS_KEY=wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY

result: OK
checksum: checksum
```

```
Outpost>export AWS_SESSION_TOKEN=MIICiTCCAfICCQD6m7oRw0uXOjANBgk
VVMxCzAJBgNVBAgTAldBMRAwDgYDVQQHEwdTZWF0dGxlMQ8wDQYDVQQKEwZBbWF6
b24xFDASBgNVBAsTC0lBTSBDb25zb2xlMRIwEAYDVQQDEwlUZXN0Q2lsYWMxHzAd
BgkqhkiG9w0BCQEWEG5vb25lQGFtYXpvbi5jb20wHhcNMTEwNDI1MjA0NTIxWhcN
MTIwNDI0MjA0NTIxWjCBiDELMAkGA1UEBhMCVVMxCzAJBgNVBAgTAldBMRAwDgYD
VQQHEwdTZWF0dGxlMQ8wDQYDVQQKEwZBbWF6b24xFDASBgNVBAsTC0lBTSBDb25z
b2xlMRIwEAYDVQQDEwlUZXN0Q2lsYWMxHzAdBgkqhkiG9w0BCQEWEG5vb25lQGFt
YXpvbi5jb20wgZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBAMaK0dn+a4GmWIWJ
21uUSfwfEvySWtC2XADZ4nB+BLYgVIk60CpiwsZ3G93vUEIO3IyNoH/f0wYK8m9T
rDHudUZg3qX4waLG5M43q7Wgc/MbQITxOUSQv7c7ugFFDzQGBzZswY6786m86gpE
Ibb3OhjZnzcvQAaRHhdlQWIMm2nrAgMBAAEwDQYJKoZIhvcNAQEFBQADgYEAtCu4
nUhVVxYUntneD9+h8Mg9q6q+auNKyExzyLwaxlAoo7TJHidbtS4J5iNmZgXL0Fkb
FFBjvSfpJIlJ00zbhNYS5f6GuoEDmFJl0ZxBHjJnyp378OD8uTs7fLvjx79LjSTb
NYiytVbZPQUQ5Yaxu2jXnimvw3rrszlaEXAMPLE=

result: OK
checksum: checksum
```

```
Outpost>export AWS_DEFAULT_REGION=us-west-2

result: OK
checksum: checksum
```

get-connection

The **get-connection** command returns the status of the service link connection between the Outposts server and the Outpost service in the AWS Region for the Outposts server.

Syntax

```
Outpost>get-connection [index]
```

Parameters

This command takes an optional connection index. The valid values are 0 and 1.

Example output: Successful connection

```
keys_exchanged: True
connection_established: True
exchange_active: False
primary_peer: xx.xx.xx.xx:xxx
primary_status: success
primary_connection_id: a1b2c3d4567890abcdefEXAMPLE11111
primary_handshake_age: 1111111111
primary_server_public_key: AKIAIOSFODNN7EXAMPLE
primary_client_public_key: AKIAI44QH8DHBEXAMPLE
primary_server_endpoint: xx.xx.xx.xx:xxx
secondary_peer: xx.xxx.xx.xxx:xxx
secondary_status: success
secondary_connection_id: a1b2c3d4567890abcdefEXAMPLE22222
secondary_handshake_age: 1111111111
secondary_server_public_key: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY
secondary_client_public_key: je7MtGbClwBF/2Zp9Utk/h3yCo8nvbEXAMPLEKEY
secondary_server_endpoint: xx.xxx.xx.xxx:xxx
timestamp: 2023-02-22T22:19:28Z
checksum: 0x83FA0123
```

Note

- If `exchange_active` is `True`, the connection is still establishing. Retry in 5 minutes.

- If `keys_exchanged` or `connection_established` is `False`, and if `exchange_active` is `True`, the connection is still establishing. Retry in 5 minutes.

If the issue persists after 1 hour, contact Support.

get-dns

The **get-dns** command returns the DNS (Domain Name Server) IP address.

Syntax

```
Outpost>get-dns
```

Parameters

This command has no parameters.

Example output: Success

```
Outpost> get-dns
---
dns_address: 8.8.8.8
success: true
```

get-service-link-static-ip

The **get-service-link-static-ip** command, when used after you set the static configuration for the service link with the **set-service-link-static-ip** command, returns the service link static configuration values. These values are applied only after you reboot the Outposts server.

Syntax

```
Outpost>get-service-link-static-ip
```

Parameters

This command has no parameters.

Example output: Success

```
Outpost> get-service-link-static-ip
---
ip_address: 192.168.1.2
netmask: 255.255.255.0
```

```
gateway: 192.168.1.1
success: true
```

reboot

The **reboot** command reboots the Outposts server. The command will not display any response if its successful, as the Outpost device will reboot.

Syntax

```
Outpost> reboot
```

Parameters

This command has no parameters.

Example output: Success

```
Outpost> reboot
```

No response displayed if the command succeeds.

set-dns

The **set-dns** command sets the DNS (Domain Name Server) IP address.

Syntax

```
Outpost>set-dns dns
```

For example: `set-dns 8.8.8.8`

Parameters

This command requires the DNS address.

Example output: Success

```
Outpost> set-dns
---
```

```
success: True
```

set-service-link-static-ip

The **set-service-link-static-ip** command sets the static configuration for the service link. These values are applied only after you reboot the Outposts server.

Syntax

```
Outpost>set-service-link-static-ip service-link-IP-address subnet-mask network-
gateway-IP-address
```

For example: Outpost>set-service-link-static-ip *192.168.1.2 255.255.255.0 192.168.1.1*

Parameters

You must provide the following values:

- The service link IP address
- subnet mask
- network gateway IP address

Example output: Success

```
Outpost> set-service-link-static-ip
---
success: True
```

start-connection

The **start-connection** command initiates a connection with the Outpost service in the Region for the Outposts server. This command sources the Signature Version 4 (SigV4) credentials from the environment variables you loaded with **export**. The connection runs asynchronously and returns immediately. To check the status of the connection, use the section called "get-connection".

Syntax

```
Outpost>start-connection [index]
```

Parameters

This command takes an optional index. The valid values are 0 and 1.

Example output: Connection is started

```
is_started: True
asset_id: asset-id
connection_id: connection-id
timestamp: 2021-10-01T23:30:26Z
checksum: checksum
```

Site requirements for Outposts servers

An Outpost site is the physical location where your Outpost operates. Sites are only available in select countries and territories. For more information, see AWS Outposts servers FAQs. Refer to the question: **In which countries and territories are Outposts servers available?**

This page covers the requirements for Outposts servers. For the requirements for Outposts racks, see Site requirements for Outposts racks in the *AWS Outposts User Guide for Outposts racks*.

Contents

- Facility
- Networking
- Power
- Order fulfillment

Facility

These are the facility requirements for servers.

> **ⓘ Note**
>
> Specifications are for servers under normal operating conditions. For example, acoustics may sound louder during initial installation and then operate at the rated sound power after installation is complete.

- **Temperature** – The ambient temperature must be between 41–95° F (5–35° C).

  The server will shut down when the temperature is outside this range and will restart when the temperature is back within the range.

- **Humidity** – The relative humidity must be between 8–80 percent with no condensation.

- **Air quality** – The air must be filtered using a MERV8 (or higher) filter.

- **Airflow** – The position of the server must ensure a minimum clearance of 6 inches (15 cm) between the server and walls in front of and behind the server to allow for sufficient airflow clearance.

- **Weight** – The 1U server weighs 26 pounds and the 2U server weighs 36 pounds. Confirm that the location where you intend to put the server can support the weight of the server.

  To see the weight requirements for different Outposts resources, choose **Browse catalog** in the AWS Outposts console at https://console.aws.amazon.com/outposts/.

- **Rail-kit compatibility** – The rail kit that is included in your shipping package is compatible with a standard L-shaped mounting bracket of an EIA-310-D compliant 19 inch rack. The rail kit is not compatible with a U-shaped mounting bracket, as shown in the following image.
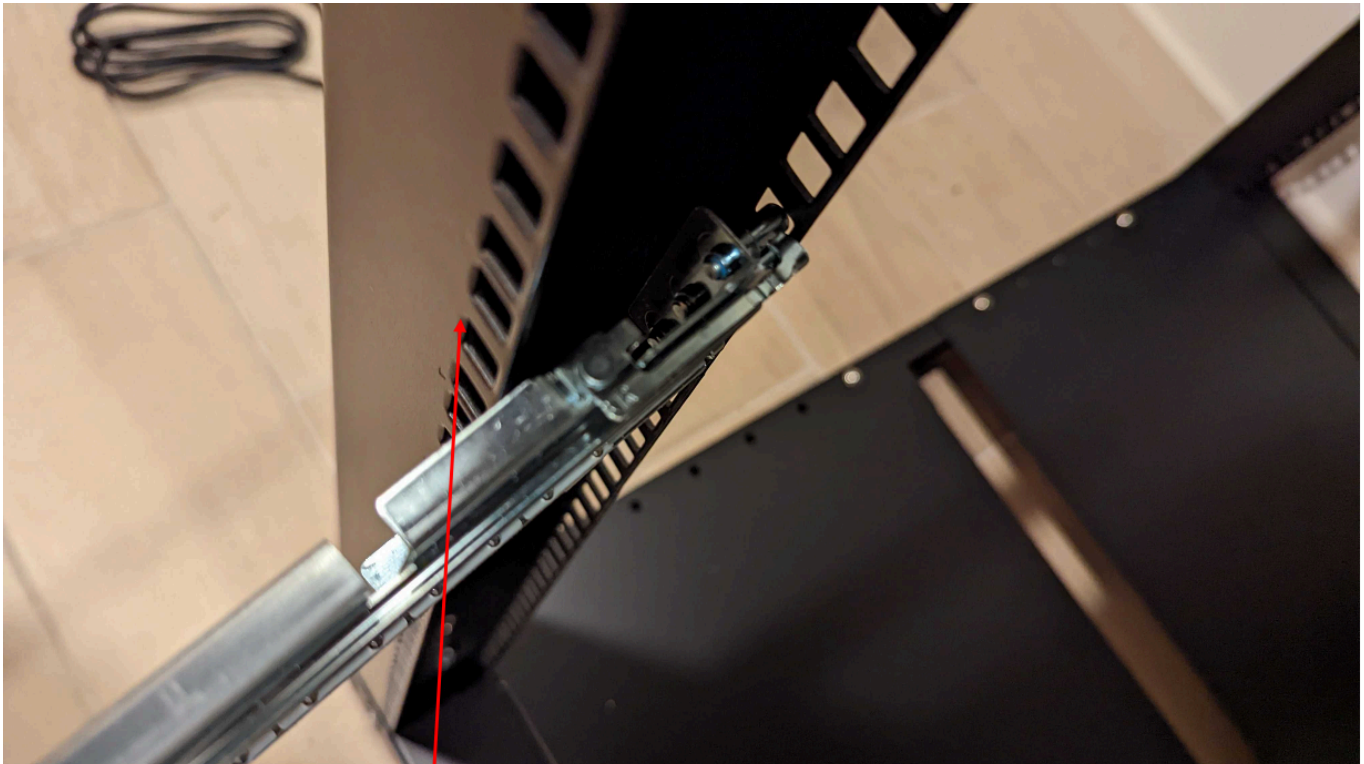
Mounting post
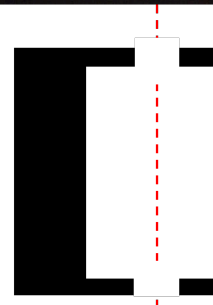
Top cross-section view of the mounting post

- **Rack Placement** – We recommend the use of standard 19-inch EIA-310D racks, with a depth of at least 36 inches (914 mm). AWS provides a rail kit for rack-mounting the server.
  - Outposts 2U servers require space with the following dimensions: 3.5 inches height (88.9mm), 17.5 inches width (447 mm), 30 inches depth (762 mm)

- Outposts 1U servers require space with the following dimensions: 1.75 inches height (44.45 mm), 17.5 inches width (447 mm), 24 inches depth (610 mm)

- Mounting AWS Outposts servers vertically is not supported.

- Outposts 1U servers are the same width as Outposts 2U servers, but half the height and less depth

If you do not place the server in a rack, you must still meet the other site requirements.

- **Serviceability** – Outposts servers are front-aisle serviceable.

- **Acoustics** – rated to be less than 78 dBA sound power at temperatures of 80 ° F (27 ° C) and meets GR-63 CORE NEBS compliance.

- **Seismic bracing** – To the extent required by regulation or code, you will install and maintain appropriate seismic anchorage and bracing for the server while it is in your facility.

- **Elevation** – The elevation of the room where the rack is installed must be below 10,005 feet (3,050 meters).

- **Cleaning** – Wipe surfaces with damp wipes that contain approved antistatic cleaning chemicals.

Networking

Each Outposts server includes non-redundant physical uplink ports. Ports have their own speed and connector requirements as detailed below.

Port label	Speed	Connector on the upstream networking device	Traffic
Port 3	10Gbe	SFP+	Both service and LNI link traffic – QSFP+ breakout cable (10 feet/3 m) segments traffic.

Service link firewall

UDP and TCP 443 must be statefully listed in the firewall.

Protocol	Source Port	Source Address	Destination Port	Destination Address
UDP	1024-65535	Service Link IP	53	DNS server
UDP	443, 1024-65535	Service Link IP	443	Outposts Service Link endpoints
TCP	1024-65535	Service Link IP	443	Outposts Registration endpoints

You can use an Direct Connect connection or a public internet connection to connect the Outpost back to the AWS Region. For Outposts service link connectivity, you can use NAT or PAT at your firewall or edge router. Service link establishment is always initiated from the Outpost.

Service link maximum transmission unit (MTU)

The network must support 1500-bytes MTU between the Outpost and the service link endpoints in the parent AWS Region. For more information about the service link, see AWS Outposts connectivity to AWS Regions in the *AWS Outposts user guide for servers*.

Service link bandwidth recommendations

For an optimal experience and resiliency, AWS requires that you use redundant connectivity of at least 500 Mbps and a maximum of 175 ms round trip latency for the service link connection to the AWS Region. The maximum utilization for each Outposts server is 500 Mbps. To increase the connection speed, use multiple Outposts servers. For example, if you have three AWS Outposts servers, the maximum connection speed increases to 1.5 Gbps (1,500 Mbps). For more information, see Service link traffic for servers in the *AWS Outposts user guide for servers*.

Your AWS Outposts service link bandwidth requirements vary depending on workload characteristics, such as AMI size, application elasticity, burst speed needs, and Amazon VPC traffic to the Region. Note that AWS Outposts servers do not cache AMIs. AMIs are downloaded from the Region with every instance launch.

To receive a custom recommendation about the service link bandwidth required for your needs, contact your AWS sales representative or APN partner.

Power

These are the power requirements for Outposts servers.

Requirements

- [Power support](#)
- [Power draw](#)
- [Power cable](#)
- [Power redundancy](#)

Power support

Servers are rated up to 1600W 90-264 VaC 47/63 Hz AC power.

Power draw

To see the power draw requirements for different Outposts resources, choose **Browse catalog** in the AWS Outposts console at https://console.aws.amazon.com/outposts/.

Power cable

The server ships with an IEC C14-C13 power cable.

Power cabling from server to rack

Use the provided IEC C14-C13 power cable to connect the server to the rack.

Power cabling from server to wall outlet

To connect the server to a standard wall outlet, you must use either an adapter for the C14 inlet or a country-specific power cord.

Ensure that you have the correct adapter or power cord for your region to save time during server installation.

- In the United States, you need an IEC C13 to NEMA 5-15P power cord.
- In parts of Europe, you might need an IEC C13 to CEE 7/7 power cord.
- In India, you need an IEC C13 to IS1293 power cord.

Power redundancy

Servers include multiple power connections and ship with cables to enable power redundant operation. We recommend power redundancy, but redundancy is not required.

Servers do not include an Uninterruptible Power Supply (UPS).

Order fulfillment

To fulfill the order, AWS will ship the Outposts server equipment, including rail mounts and required power and network cables, to the address that you provided. The box that the server is shipped in has the following dimensions:

- Box with a 2U server:
  - Length: 44 inches / 111.8 cm
  - Height: 26.5 inches / 67.3 cm
  - Width: 17 inches / 43.2 cm
- Box with a 1U server:
  - Length: 34.5 inches / 87.6 cm
  - Height: 24 inches / 61 cm
  - Width: 9 inches / 22.9 cm

Your team or a third-party provider must install the equipment. For more information, see Service link traffic for servers in the *AWS Outposts user guide for servers*.

The installation is complete when you confirm that the Amazon EC2 capacity for your Outposts server is available from your AWS account.