Junos® Space

Cross Provisioning Platform Quick Start Guide

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The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

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Cross Provisioning Platform Installation Overview

Junos Space Cross Provisioning Platform (CPP) provides a real-time operations support system (OSS) for creating and deploying services across multivendor devices. The CPP software manages the interaction of Service Activation Director (SAD) with a module called the Alcatel-Lucent 5620 Service Aware Manager.

With CPP, you can:

- Provision services between Juniper Networks devices and Alcatel-Lucent devices
- Manage SAD services and Alcatel-Lucent 5620 Service Aware Manager services
- Use REST APIs to manage services through SAD
- Use the SOAP API to manage Alcatel-Lucent 5620 Service Aware Manager

This application is built to run on Junos Space Network Management Platform—an open, secure, and scalable software platform that allows customers, partners, and developers to build and deploy simple and smart applications to manage and analyze network element data and optimize network infrastructure and operations management.

This Quick Start Guide describes how you can quickly set up a Junos Space Appliance in a single-node configuration, install CPP, and bring your devices under CPP management.

You can install Cross Provisioning Platform in one of the following hardware configurations:

- A Juniper Networks JA2500 Junos Space Hardware Appliance—The JA2500 appliance is a dedicated hardware device that provides the computing power and specific requirements to run CPP as an application.

  The JA2500 appliance has a 2-U, rack-mountable chassis with dimensions 17.81 in. x 17.31 in. x 3.5 in. (45.2 cm x 44 cm x 8.89 cm). The JA2500 appliance is shipped with a single AC power supply module; an additional power supply module can be installed in the power supply slot in the rear panel of the appliance. The JA2500 appliance can also be powered on by using one or two DC power supply modules. The appliance has six 1-TB hard drives arranged in a RAID 10 configuration. Two externally accessible cooling fans provide the required airflow and cooling for the appliance.

  For details about the JA2500 appliance and instructions for installation, see Installing Juniper Networks Junos Space JA2500 Appliance.

- Junos Space Virtual Appliance—The Junos Space Virtual Appliance consists of preconfigured Junos Space Network Management Platform software with a built-in operating system and application stack that is easy to deploy, manage, and maintain. A Junos Space Virtual Appliance includes the same software and provides all the functionality available in a Junos Space physical appliance. However, you must deploy the virtual appliance on the VMware ESX or ESXi server, which provides a CPU, hard disk, RAM, and a network controller, but requires installation of an operating system and applications to become fully functional.

For information about installing Junos Space appliances in a fabric configuration and installing Junos Space Virtual Appliance on a VMware ESX or ESXi server, see Junos Space Virtual Appliance.

Follow all safety warnings and precautions as specified in General Safety Guidelines and Warnings.

The following sections describe the basic steps to install and configure CPP on a Junos Space JA2500 Appliance:

Configuring Basic Junos Space Virtual Appliance Settings

The basic configuration procedure for setting up the hardware appliance to run as a single Junos Space node is summarized in this topic. For complete configuration steps, see Configuring a Junos Space Appliance or Configuring the Basic Settings of a Junos Space Virtual Appliance.

You need two IP addresses on the same subnet to complete the configuration. The first IP address is for the eth0 interface on the appliance; the second IP address is for accessing Junos Space by using the Web GUI.

1. At the Secure Console login prompt, type the default username (**admin**) and press Enter.
2. Type the default password (**abc123**) and press Enter.

   You are prompted to change your password.
3. To change the default password:
   a. Type the default password and press Enter.
   b. Type a new password and press Enter.
   c. Retype the new password and press Enter.

   If the password is changed successfully, the message **passwd: all authentication tokens updated successfully** is displayed.

NOTE:

- All passwords are case-sensitive.
- A valid password must contain at least eight characters, of which at least three are of the following four character classes: uppercase letters, lowercase letters, numbers (0 through 9), and special characters and must not contain a single uppercase letter at the beginning or only a single number at the end.

  For example, Abcdwip9, Qc9rdiwt, and bRfjvin9 are invalid passwords, but AAbcdwip99, Qc9rdiwtQ, and bRfjvin99 are valid passwords.
- Alternatively, instead of using a string of characters, you can choose a passphrase that contains 16 through 40 characters, and includes at least three dictionary words separated by at least one special character. For example, big#three;fork (contains 14 characters) and circlefaceglass (no special characters) are invalid, whereas @big#three;fork& and circle;face;glass are valid.

4. Enter the new password to log in to the appliance.
5. Type **s** to proceed with the configuration of the appliance as a Junos Space node with full Junos Space Network Management Platform functionality. Every Junos Space installation requires at least one Junos Space node.
6. Select IPv4 or IPv6 as the option for IP addresses and specify the following details:
   a. Enter a new IP address for the eth0 interface; for example, 10.10.20.15.
   b. Enter a subnet mask for the eth0 interface; for example, 255.255.255.0.

      NOTE: If you are configuring the appliance as part of a cluster (fabric), then all nodes in that fabric must be in the same subnet.

      For more information about the Junos Space fabric, see the *Fabric Management* chapter in the *Junos Space Network Management Platform User Guide* (available at http://www.juniper.net/techpubs/en_US/release-independent/junos-space/index.html).

   c. Enter the IP address for the default gateway; for example: 10.10.20.1.

      NOTE: For detailed steps on configuring network settings, see Configuring a Junos Space Appliance as a Junos Space Node.

7. Enter the DNS name server address for the eth0 interface; for example, 192.168.15.168.
8. Enter **n** as the response to the prompt: **Configure a separate interface for device management? [y/n]**.

9. Enter **n** as the response to the prompt: **Will this Junos Space system be added to an existing cluster? [y/n]**.
10. Enter the IP address for the Web server. This IP address must be in the same subnet as the IP address for the eth0 interface, but a separate address; for example, 10.10.20.18.
11. Add an NTP server to synchronize the node with an external NTP source; for example, you can specify ntp1.example.com as the external NTP server.
12. Enter the display name (logical node name) for this node; for example, tp-junosspace-01.
13. Enter the password for the appliance when the appliance is in maintenance mode. The maintenance mode administrator must specify this password to access maintenance mode and shut down all nodes.
14. Reenter the password to confirm the password. The system displays the settings summary.

    ```
    Settings Summary:

    > IP Change: eth0 is 10.10.20.15 / 255.255.255.0
    > Default Gateway = 10.10.20.1 on eth0
    > DNS add: 192.168.15.168
    > Create as first node or standalone
    > NTP add: ntp1.example.com
    > Web IP address is 10.10.20.18
    > Node display name is "tp-junosspace-01"
    > Password for Junos Space maintenance mode is set.

    A> Apply settings
    C> Change settings
    Q> Quit and set up later
    R> Redraw Menu

    Choice (ACOR):
    ```

15. Review the summary. If the settings are correct, enter **A** to apply the settings. The system is initialized and the initialization messages appear before the system displays the Junos Space Appliance settings menu.

    ```
    Choice [ACQR]: A

    .
    .
    .
    Last login: Wed Feb  6 18:16:25 on ttyS0

    Welcome to the Junos Space network settings utility.

    Initializing, please wait


    Junos Space Settings Menu

    1> Change Password
    ```

```
2> Set DNS Servers
3> Change Time Options
4> Retrieve Logs
5> Security
6> (Debug) run shell

Q> Quit
R> Redraw Menu

Choice [1-6,QR]:
```

16. Type **Q** to quit the session.

The configuration of the JA2500 Appliance is now complete.

Upgrading Junos Space Network Management Platform

If your appliance is running the supported version of Junos Space Platform, you can skip this procedure and begin the installation of Cross Provisioning Platform (CPP).

NOTE: For more information about the supported version of Junos Space Platform, see the corresponding release notes of CPP.

If your appliance is running a Junos Space Platform release that is earlier than the supported release, you need to upgrade Junos Space Platform before installing CPP.

To determine the Junos Space Platform release version and to upgrade Junos Space Platform:

1. Identify the version of the installed Junos Space Platform:
   a. Log in to Junos Space Platform by using the default username and password for Junos Space Platform: **super** and **juniper123**.

      Junos Space Platform opens the dashboard.

   b. Click the plus symbol **(+)** next to Administration to expand the Administration menu.

   c. Click **Applications** to list all of the applications installed.

   d. Note the version of the Junos Space Platform or the Network Application Platform. (Some earlier versions of the Junos Space Platform were named Network Application Platform.) If the currently installed release is a supported one, you can skip the rest of this procedure; if not, you must upgrade the Junos Space Platform to a supported release.

2. Determine how many releases you need to install to bring the software up to minimum requirements.

Junos Space Platform supports upgrades from the preceding two versions. For example, Junos Space Platform Release 15.1 supports upgrading from Release 14.1 or 13.3. Upgrades from releases still earlier require multiple steps.

3. Open a new browser page, log in to the Juniper customer support portal, and download the required Junos Space Platform version to either the hard disk or to an SCP server. The Junos Space Platform software images are located at http://www.juniper.net/support/downloads/?p=space.
4. Return to your Junos Space Platform session after the download is completed.
5. Upgrade Junos Space Platform to a supported release.

   Complete installation steps are provided at *How Do I Upgrade Junos Space?*

Installing Cross Provisioning Platform

Before you begin:

- You cannot install Network Activate on the same system as Cross Provisioning Platform (CPP). Uninstall Network Activate before you install CPP on your system.
- Uninstall Junos Space Virtual Control, if it is installed on your Junos Space Network Management Platform. After uninstalling Virtual Control, you must run the cleanup script before you proceed with the installation. You can download the cleanup script for Virtual Control from the Junos Space and Junos Space Cross Provisioning Platform Download page.
- Download CPP software image to the hard disk or an SCP server. Open a new browser page, log in to the Juniper software downloads page and download the required CPP version to either the hard disk or an SCP server. The CPP software images are located at the Junos Space and Junos Space Cross Provisioning Platform Download page.

To install CPP from the Administration > Applications page of Junos Space:

1. Click the plus symbol (+) on the top left of the page to add the application.
2. Click either **Upload via HTTP** or **Upload via SCP** and upload the image as follows:
   - To upload CPP by using HTTP:
     a. Click **Upload via HTTP** to open the dialog box.
     b. Navigate to the local location where the Cross Provisioning Platform or the Cross Provisioning Platform API image is stored.
     c. Select the image file and click **Open** to load the path.
     d. Click **Upload** to load the image file into Junos Space.
   - To upload CPP by using SCP:
     a. Click **Upload via SCP** to open the Upload dialog box.

b. Enter the secure copy credentials to upload the image from a remote server to Junos Space.

i. **User**—Enter the username.

ii. **Confirm Password**—Enter the password and reenter the password in the Confirm Password field.

iii. **IP address**—Enter the host IP address.

iv. **Path**—Enter the local pathname of the CPP application file.

c. Click **Upload** to load the image file into Junos Space.

3. Click **OK** to skip viewing the job results.
4. Select **Cross Provisioning Platform** and click **Install**.
5. Click **OK** in the Application Configuration window dialog box.

   You can check the Job Status page to view the progress of the installation job. When the installation is completed, Cross Provisioning Platform appears on the Applications inventory page. The new application also appears in the Application Chooser (at the upper-left corner).
6. Download the DMI schemas for devices that require a later schema and upload the schema to Junos Space.
7. To work with CPP, select **Cross Provisioning Platform** from the Applications list in the upper-left corner above the Tasks tree.

   CPP is displayed in your browser window in the default view.
8. (Optional) Bookmark this page in your browser for future use.

   You can use the bookmarked URL to log in to CPP without logging in to Junos Space first.
9. Depending on your networking requirements, perform the initial configuration of Cross Provisioning Platform. See *Modifying Application Settings*.

Upgrading Cross Provisioning Platform

Before you start the upgrade, ensure that you have:

- Disabled monitoring for all categories on the Monitoring tab of the Preferences page. For more details, see Disabling Data Collection for Monitors.
- Backed up your database by using the Junos Space Platform backup feature. For more details, see Backing Up and Restoring the Database Overview.
- Junos Space running on your appliance. If your appliance is running an unsupported release of Junos Space, you must upgrade Junos Space before installing Cross

Provisioning Platform(CPP). For step-by-step instructions on upgrading Junos Space, see "Upgrading Junos Space Network Management Platform" on page 5.

- Downloaded the CPP software image to the hard disk or to an SCP server. The CPP software image is located at http://www.juniper.net/support/downloads/space.html.

To upgrade CPP from the **Administration > Applications** page of Junos Space:

1. Select CPP from the list of installed applications and click **Upgrade Application** from the Actions menu.
2. Click either **Upload via HTTP** or **Upload via SCP** and navigate to the location where you stored the CPP image.

   Based on your selection, the Upload via HTTP or Upload via SCP dialog box appears.

   To upload CPP by using HTTP:

   a. Click **Upload via HTTP** to open the dialog box.

   b. Navigate to the local location where the Cross Provisioning Platform image is stored.

   c. Select the image file and click **Open** to load the path.

   d. Click **Upload** to load the image file into Junos Space.

   To upload CPP by using SCP:

   a. Click **Upload via SCP** to open the Upload dialog box.

   b. Enter the Secure Copy credentials to upload the CPP image from a remote server to Junos Space.

      i. **User**—Enter the username.

      ii. **Confirm Password**—Enter the password and reenter the password in the Confirm Password field.

      iii. **IP address**—Enter the host IP address.

      iv. **Path**—Enter the local pathname of the CPP application file.

   c. Click **Upload** to load the image file into Junos Space.
3. Click **OK** to skip viewing the job results.
4. Select **Cross Provisioning Platform** and click **Upgrade**.

   You can check the Job Status page to see the progress of the upgrade job. When the upgrade is completed, Cross Provisioning Platform appears on the Applications inventory page.

5. After you upgrade CPP, you must restart JBoss for the monitoring and fault features to work properly in standalone and cluster setups:

   To restart the JBoss server in a standalone setup:

   a. Stop the watchdog, domain controller, and JBoss services on the standalone node.

      service jmp-watchdog stop

      service jboss-dc stop

      service jboss stop

   b. Start the watchdog service.

      service jmp-watchdog start

      

      NOTE: Starting the watchdog service restarts the JBoss and domain controller services as well.

      It takes approximately 20 minutes for the JBoss server to come up after the restart.

   To restart the JBoss server in a cluster setup:

   a. Stop the services on the secondary node.

      service jmp-watchdog stop

      service jboss stop

   b. Stop the services on the primary node (You can find the VIP hosted node in Space > Fabric).

      service jmp-watchdog stop

      service jboss-dc stop

      service jboss stop

   c. Start the services on the primary node.

      service jmp-watchdog start

   d. Start the services on the secondary node.

      service jmp-watchdog start

      It takes approximately 20 minutes for the JBoss server to come up after the restart.

6. Download the DMI schemas for devices that require a later schema, and upload the schema to Junos Space.
7. To work on CPP, select **Cross Provisioning Platform** from the Applications list in the upper-left corner above the Tasks tree.

   The CPP page is displayed in the browser window.
8. (Optional) Bookmark this page in your browser for future use.

You can use the bookmarked URL to log in to CPP without logging in to Junos Space first.

Uploading DMI Schemas

Each device type is described by a unique data model (DM) that contains all the configuration data for the device type. The DMI schema lists all the possible fields and attributes for a type of device. The later schemas describe the new features of recent device releases. It is important that you load all your device schemas into Junos Space Network Management Platform; otherwise, only a default schema is applied when you try to edit a device configuration by using the device configuration edit action in the Devices workspace.

In most installations, Junos Space automatically matches DMI schemas to device families. However, there might be certain situations where your network uses a device for which Junos Space does not have the latest or supported schema available. In such instances, you must obtain and upload the requisite schema and set that schema as the default DMI schema for that device family. Set a default DMI schema for each device family to enable Junos Space to apply the appropriate schema to a device family.

For each of the Cross Provisioning Platform (CPP) release, we recommend that you use the corresponding schema. For example, if you are installing Cross Provisioning Platform Release 14.3, you must download Release 14.3 schema. You can download the schema from Schema Repository.

If you cannot find the equivalent schema, use the latest schema from the main release or contact Juniper Support System (JSS).

To install or update a DMI schema on Junos Space:

1. From the Network Application Platform, navigate to **Administration > Manage DMI Schemas > Update Schema**.

   The Update Schema page appears.

   To add or update a DMI schema, you must have the **.tgz** archive files containing the schema on the machine running the Junos Space GUI. There are several ways of acquiring such files.

   You can:

   - Download files from Juniper Networks SVN repository
   - Obtain files from JSS
   - Create your own files

   For detailed steps on acquiring and uploading the schema files, see Junos Space Documentation or Managing DMI Schemas Overview.

2. After uploading the schema, select the schema and click **Install**.

The Manage DMI Schemas inventory landing page appears, displaying the newly installed schema. The Manage DMI Schemas page displays data in a table that contains the following columns:

- Device Family—Type of device family
- OS Version—Version of Junos OS
- Device Series—Type of Juniper Networks device
- State—Whether default or not. An empty cell in this column means that the DMI schema in that row is not the default.

  In the thumbnail view, this information is displayed on each thumbnail.

3. In the tabular view, select the row that contains the appropriate combination of device family, OS version, and device series, and mouse over the **Actions** menu to select **Set Default Schema**.

   In the thumbnail view, select the appropriate thumbnail and perform the same action.

   The Set Default DMI Schema dialog box opens, displaying the DMI schema name, device family, and OS version.

4. Click **Set Default**.

   If any other schema was previously the default, in the tabular view, the cell in the State column appears empty, and the word *Default* appears in the State column for the selected schema. In the thumbnail view, the default status is indicated by an orange-colored asterisk on the icon for a DMI schema, and the word *Default* below the OS version.

Preparing Devices for Management by Cross Provisioning Platform

To discover and manage devices, Cross Provisioning Platform (CPP) requires the following minimum device configuration as a prerequisite for installation on a device.

Ensure that the device:

- Has a static management IP address that is reachable from the Junos Space server. The IP address can be an in-band address or an out-of-band address.
- Is enabled for SSH v2. Issue the **set system services ssh protocol-version v2** command to enable SSH v2 on ACX Series, EX Series, M Series, MX Series, and PTX Series routers.
- Has a user ID with the superuser class configured. Junos Space and CPP use this user ID to authenticate the SSH connection with the device.
- Is enabled for SNMP with the appropriate read-only V1, V2, and V3 credentials created. You do not need to configure SNMP trap receivers; CPP configures traps by performing a deployment task.

In addition, the following protocol ports must be open for CPP communication:

- Port 22 for SSH connections. If you have changed the SSH port to a port other than port 22 on your Junos Space Platform, you must change the SSH ports on your managed devices to the port that the Junos Space Platform is using.
- Port 10162 for SNMP traps. CPP receives traps from managed devices on this port. (After you install CPP, use CPP to configure SNMP on your devices to send traps to CPP on this port.)
- Port 162 for service-level SNMP traps. CPP uses OpenNMS for SNMP trap collection and correlation.
- Port 21 (TCP) and port 69 (UDP) for uploading the software image and configuration file to the FTP server.

You can verify whether a port is open by logging in to the Junos Space CLI and using the **nmap** command. For example, to determine whether port 8889 is open on a controller, issue the following command:

root@space# nmap <*IP address of controller*> -p 8889

Discovering Devices

When you start Cross Provisioning Platform (CPP) for the first time, the Junos Space database does not contain any devices. The first step is to add devices from your network to the Junos Space Platform database. Even with large networks, CPP has made this step relatively easy and straightforward. You add configuration and runtime information about the devices to CPP and the database by using a process called *device discovery*. When a device is discovered, the device's interface is displayed and CPP begins to monitor the device.

For more information about device discovery, see *Prestaging Devices Overview*, *Prestaging Devices Process Overview*, and *Discovering and Assigning All N-PE Devices*.

Exploring Cross Provisioning Platform

After your devices are functional and synchronized with the Junos Space Platform database, several functions in CPP are automatically enabled. However, there are a few additional tasks that you need to perform to use all the features of CPP. We recommend that you do the following:

- Set up users.

  After you install CPP, only one username is defined: *super* with the default password, *juniper123*.

  You have the ability to set up users with different CPP privileges. New CPP users are set up in Junos Space and are assigned the roles and privileges defined in Junos Space. For more information about setting up users, see *Creating a User-Specific Role to Prevent or Allow Certain Actions on a Service*.

- Learn what you can do with CPP

  There are two ways you can become familiar with the functions and features of CPP:

- Read *Junos Space Cross Provisioning Platform Release Notes*. These release notes highlight the primary features of CPP.
- Use the extensive help system that guides you through CPP. Clicking the main Help icon provides a top-down view into the help system; clicking a Help icon on a pane or window provides context-sensitive information. Use the help system to become familiar with CPP and the different modes and panes of the interface.

Getting Started with Cross Provisioning Platform

Based on your network deployment requirements and configuration settings, you may require a service to be applied on devices in your topology. It is essential to discover or add the devices that you want to be administered using Cross Provisioning Platform (CPP) to the Junos Space Platform application database, before you can enable and define the service. The devices must be configured with the basic and mandatory device settings before the devices are discovered for additional modifications, such as the configuration of a service. These settings include routing instances, routing protocols, interfaces, and administrative groups.

The following workflow describes the tasks that you need to perform after the installation of CPP to enable effective and streamlined management, provisioning, and troubleshooting of devices and services configured using CPP.

1. Discover devices using the Cross Provisioning Platform GUI or the Junos Space Platform workspace. For instructions on discovering devices with CPP, see *Discovering and Assigning All N-PE Devices*. For instructions on discovering devices using the Junos Space Platform workspace, see *Discovering Devices* in the *Junos Space Network Application Platform User Guide*.

   NOTE: Before you can add a device to the Junos Space Platform database using device discovery, the following conditions must be met:

   - SSH v2 is enabled on the device. To enable SSH v2 on a device, issue the following CLI command:

     ```
     set system services ssh protocol-version v2
     ```

   - The NETCONF protocol over SSH is enabled on the device. To enable the NETCONF protocol over SSH on a device, issue the following CLI command:

     ```
     set system services netconf ssh
     ```

   - The device is configured with a static management IP address that is reachable from the Junos Space server. The IP address can be an in-band address or an out-of-band address.
   - A user with full administrative privileges is created on the device for the Junos Space administrator.
   - If you plan to use SNMP to probe devices as part of device discovery, ensure that SNMP is enabled on the device with appropriate read-only V1, V2C, or V3 credentials.

2. Discover the roles of devices and assign network-provider edge (N-PE) roles as necessary. To prestage devices and assign device roles, see *Discovering Device Roles* and *Discovering and Assigning N-PE Devices with Exceptions*.
3. Create service templates. Templates provide a powerful mechanism to configure advanced service-related options that are not exposed through the service order creation workflow. Templates are attached to a service definition. To work with service templates, see *Service Templates Overview* and *Applying a Service Template to a Service Definition*.
4. Review the predefined service definitions that are available by default and determine whether you want to create a new customized service definition. A service definition specifies the attributes that are common among a group of service orders that have similar service requirements. To work with service definitions, see *Predefined Service Definitions* and *Creating a Cross Provisioning Platform Service Definition*.
5. Create customers that denote the users to be associated with service orders. New customers must be identified to the system before you can provision and activate a service order for customers. To create customers, see *Adding a New Customer*.
6. Create service orders. A service order is an instance of the service definition that completes the definition for a specific customer's use. To work with service orders, see *Creating a Cross Provisioning Platform Service Order*.

7. Deploy service orders to propagate the service configuration to the corresponding devices. To transfer service order configurations to devices and apply the settings on the devices, see *Deploying a Service*.
8. Perform audit operations, such as functional and configuration audit, to examine the status of interfaces, neighbor links, and endpoints. You can also identify whether the service configuration on the device has been changed out of band. In addition, you can use op scripts to perform any function available through remote procedure calls (RPCs) supported by either the Junos XML management protocol or the Junos XML API. See *Performing a Functional Audit*, *Performing a Configuration Audit*, and *Troubleshooting N-PE Devices Before Provisioning a Service* for further information.