



Junos[®] Space

Junos Space Sync Design

Release
14.3



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Junos® Space Junos Space Sync Design

Release 14.3

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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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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- JA1500

Documentation Conventions

Table 1 on page x defines notice icons used in this guide.

Table 1: Notice Icons







Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page x defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none">To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric <i>metric</i>>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	<pre>[edit] routing-options { static { route default { nexthop <i>address</i>; retain; } } }</pre>
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none">In the Logical Interfaces box, select All Interfaces.To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page at the Juniper Networks Technical Documentation site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>.

- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Sync Design Overview on page 3](#)

CHAPTER 1

Sync Design Overview

- [Sync Design Application Overview on page 3](#)
- [Unmanaged Grandmaster Devices Overview on page 5](#)
- [Boundary Clock Overview on page 5](#)
- [Precision Timing Protocol \(PTP\) over Ethernet on ACX Series Universal Access Routers on page 7](#)

Sync Design Application Overview

The Sync Design application manages synchronization devices or subsystems for Juniper Networks devices such as Juniper Networks TCA Series Timing Appliances, ACX Series Universal Access Router as well as synchronization subsystems within other Juniper Networks devices that support the IEEE 1588-2008 standard, *Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*, commonly known as Precision Time Protocol, or PTP. In addition to managing device-level synchronization attributes, Sync Design also manages logical timing entities or domains that comprise groups of devices or subsystems. Users can create timing domains, assign various synchronization devices and subsystems to a domain and then apply a specific service template to each domain. Sync Design scans through the devices in the timing domain and performs configuration operations one-by-one based on the service template, thus automating and greatly simplifying the configuration process.

Based on the Open Service Platform, Sync Design provides configuration management, health monitoring, discovery, and GUI visualization of synchronization devices. The device discovery and inventory management are handled by the Junos Space base platform. Fault management and performance management are handled by Open NMS, which is an integral part of the Junos Space platform.

The Sync Design application supports the following key functions:

- The Sync Design application discovers the following devices from the platform:
 - ACX Series Universal Access Routers
 - TCA Series Timing Appliances
- You can associate a service to the following devices:
 - All TCA devices—Supports PTP service

- ACX1000 and ACX2000 Universal Access Routers—Supports both PTP and Synchronous Ethernet services
- PTP Configuration
 - Configuration of grandmaster function on TCA 8x00
 - Configuration of slave function on TCX 6x00 and ACX devices
 - Support for Telecom Profile
 - Configuration of multiple slave instances on the ACX, with one active slave at any given time

- Synchronous Ethernet configuration on ACX devices

Synchronous Ethernet forms a chain or tree of interconnected ethernet equipment clock (EEC) whose source can be traced to the primary reference clock (PRC). The Synchronous Ethernet is more accurate in terms of frequency as it is independent of network load. Synchronous Ethernet supports synchronization signals along the EEC tree or chain. It is called the ethernet synchronous messaging channel (ESMC). The ESMC carries information about quality of clock from the source to all the clocks along the branches of Synchronous Ethernet clock hierarchy. It defines two messages:

1. Information Message
2. Event Message

**Related
Documentation**

- [Discovering and Managing Timing Devices on page 11](#)
- [Creating a PTP Service Definition on page 17](#)
- [Creating a Synchronous Ethernet Definition on page 27](#)
- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)

Unmanaged Grandmaster Devices Overview

When interoperability with an unmanaged third-party device is necessary, you can use Junos Space to define the link between a Juniper Networks managed device and the third-party device. You need to specify the IP address and the end point interface name of the unmanaged device. Junos Space does not validate the information of an unmanaged device. You cannot configure an unmanaged device. Junos Space pushes the configuration only to the managed device.

You can add such devices to Junos Space manually, or import multiple devices at the same time from a CSV file. You need to provide the IP address or the hostname of the third-party devices, the vendor names, and optionally their SNMP credentials. If Junos Space can communicate with the device using SNMP, the information gathered through SNMP overrides the information that you enter. For more information on adding unmanaged information, see *Adding Unmanaged Devices*.

The Sync Design application manages synchronization devices or subsystems for Juniper Networks devices such as Juniper Networks TCA Series Timing Appliances and ACX Series Universal Access Routers, as well as synchronization subsystems within other Juniper Networks devices that support the IEEE 1588-2008 standard, *Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*, commonly known as Precision Time Protocol, or PTP.

PTP uses master-slave architecture for clock synchronization. You can use an unmanaged grand master device to synchronize with the destination (slave) clock in the network. That unmanaged grand master must support the IEEE 1588-2008 standard grand master configuration or implementation. You have to manually configure the unmanaged grand master to be synchronized with the destination (slave) clock.

- Related Documentation**
- [Adding Unmanaged Devices on page 14](#)
 - [Provisioning an Unmanaged Grand Master Device on page 48](#)

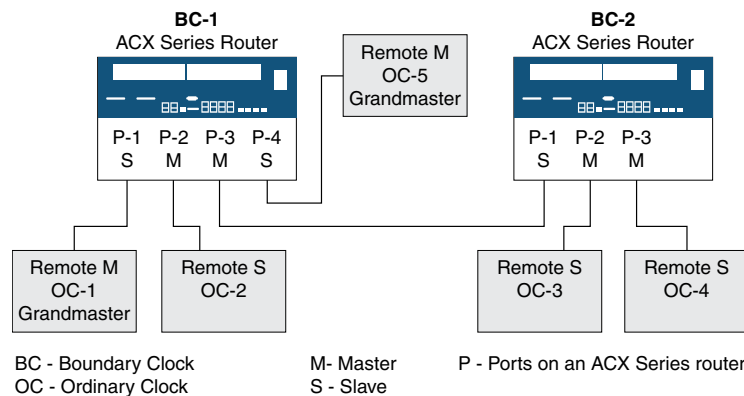
Boundary Clock Overview

An IEEE 1588v2 boundary clock has multiple network connections and can act as a source (master) and a destination (slave or client) for synchronization messages. It synchronizes itself to a best master clock through a slave port and supports synchronization of remote clock clients to it on master ports. Boundary clocks can improve the accuracy of clock synchronization by reducing the number of 1588v2-unaware hops between the master and the client. Boundary clocks can also be deployed to deliver better scale because they reduce the number of sessions and the number of packets per second on the master.

The boundary clock intercepts and processes all Precision Time Protocol (PTP) messages and passes all other traffic. The best master clock algorithm (BMCA) is used by the boundary clock to select the best configured acceptable master clock that a boundary slave port can see.

Figure 1 on page 6 illustrates two ACX Series boundary clocks in a network in which the clock flow is from the upstream node (BC-1) to the downstream node (BC-2).

Figure 1: ACX Series Boundary Clocks



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The first boundary clock—BC-1—has four ports. Each port is configured as follows:

- BC-1 P-1 and BC-1 P-4 are boundary slave ports connected to two grandmaster clocks—OC-1 and OC-5. The grandmasters are included as the clock sources in the slave port configurations. From the packets received on the slave ports, BC-1 selects the best master, synchronizes its clock, and generates PTP packets, which are sent over the master ports—BC-1 P-2 and BC-1 P-3—to the downstream clients.
- BC-1 P-2, a master port, is connected to OC-2, an ordinary remote slave. OC-2 is included as a clock client in BC-1 P-2's master configuration, and so receives PTP packets from BC-1 P-2.
- BC-1 P-3, a master port, is connected to BC-2 P-1, a remote boundary slave port. In this situation, the master port—BC-1 P-3—is included as a clock source in the configuration of the boundary slave port—BC-2 P-1. In addition, the boundary slave port—BC-2 P-1—is included as a clock client in the configuration of the master port—BC-1 P-3. With this configuration, the boundary slave—BC-2 P1—receives PTP packets from BC-1 P3.

The second boundary clock—BC-2—has three ports. Each port is configured as follows:

- BC-2 P-1 is a boundary slave port connected to the upstream master port—BC-1 P3. As described previously, BC-2 P-1 receives PTP packets from BC-1 P3. The master ports—BC-2 P-2 and BC-2 P-3—synchronize their time from the packets received from BC-2 P1.
- BC-2 P-2 and BC-2 P-3, boundary master ports, are connected to ordinary remote slaves—OC-3 and OC-4. OC-3 and OC-4 are included as clock clients in the configuration of the master ports—BC-2 P2 and BC-2 P-3. Both slaves receive PTP packets from the master boundary port to which they are connected.

In this example, the boundary clock synchronizes its clock from the packets received on its slave ports from the upstream master. The boundary clock then generates PTP packets, which are sent over the master port to downstream clients. These packets are time

stamped by the boundary clock by using its own time, which is synchronized to the selected upstream master.

**Related
Documentation**

- [Sync Design Application Overview on page 3](#)
- [Creating a PTP Service Definition on page 17](#)
- [Creating a PTP Timing Service Order on page 31](#)

Precision Timing Protocol (PTP) over Ethernet on ACX Series Universal Access Routers

The IEEE 1588v2 standard defines the Precision Time Protocol (PTP), which is used to synchronize clocks throughout a packet-switched network. This synchronization is achieved through packets that are transmitted and received in a session between a master clock and a slave clock or remote clock client. The clocks used for the distribution of accurate time are in an hierarchical master/slave architecture, which includes boundary clocks, ordinary clocks, and grandmaster clocks. A boundary clock is both a clock source *and* a clock client. An ordinary clock is either a clock source *or* a clock client. However, a grandmaster clock is always a clock source. An ordinary clock on an ACX Series router is always a clock client. In addition, User UDP over IPv4 and unicast mode are used to transport PTP messages.

On an ACX Series router, the following key PTP features are supported:

- **Boundary clock**—A boundary clock has multiple network connections and can act as a source (master) and a destination (slave or clock client) for synchronization messages. It synchronizes itself to a best master clock through a slave port and supports synchronization of clients to it on master ports. Boundary clocks can improve the accuracy of clock synchronization by reducing the number of 1588v2-unaware hops between the master and the client. Boundary clocks can also be deployed to deliver better scale because they reduce the number of sessions and the number of packets per second on the master.
- **Ordinary clock**—The PTP ordinary clock has a single network connection and can act as a source (master) or destination (slave or clock client) for synchronization messages. On ACX Series routers, the ordinary clock is a slave, which receives synchronization reference messages from a master, either a grandmaster or a master boundary clock. You cannot configure an ordinary master on an ACX Series router. However, a boundary clock can provide time to the ordinary slave.
- **PTP grandmaster clock**—The PTP grandmaster clock communicates time information to destination or slave ports. The grandmaster clock is an external device to which the boundary or ordinary clock synchronizes. You cannot configure a grandmaster clock on an ACX Series router. However, a boundary clock slave or an ordinary clock slave can receive time from a grandmaster clock.
- **Clock source**—A clock source is the PTP master clock to which the slave synchronizes. The clock source is included in the configuration of the slave clock.



NOTE: The term *master* is sometimes used to refer to the clock source.

- Clock client—A clock client is the remote PTP host, which receives time from the PTP master. The clock client is included in the configuration of the master clock.



NOTE: The term *slave* is sometimes used to refer to the clock client.

- Unicast mode (IPv4 on Gigabit Ethernet interfaces only)—Unicast mode is a user-to-user protocol used to send a datagram to a single recipient. Unicast mode is used for transporting PTP messages.

**Related
Documentation**

- [Sync Design Application Overview on page 3](#)
- [Boundary Clock Overview on page 5](#)
- [Creating a PTP Service Definition on page 17](#)
- [Creating a PTP Timing Service Order on page 31](#)

PART 2

Configuration

- [Prestaging Timing Devices on page 11](#)
- [Managing Sync Design Service Definitions on page 17](#)
- [Managing Sync Design Service Orders on page 31](#)

CHAPTER 2

Prestaging Timing Devices

- [Discovering and Managing Timing Devices on page 11](#)
- [Configuring Device Service on page 12](#)
- [Adding Unmanaged Devices on page 14](#)

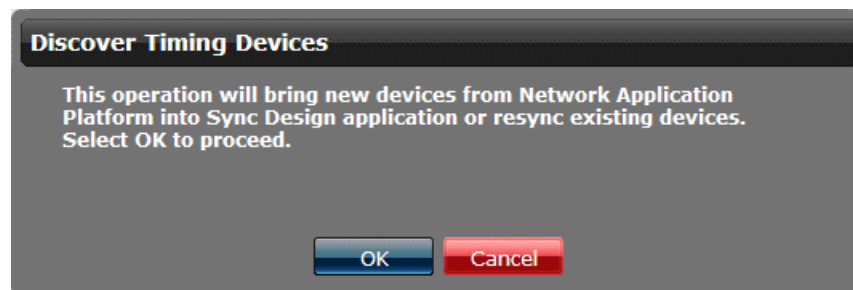
Discovering and Managing Timing Devices

In the Sync Design task pane, select **Prestage Timing Devices > Manage Timing Devices**.

1. [Discovering Timing Devices on page 11](#)
2. [Managing Timing Devices on page 11](#)

Discovering Timing Devices

In the Sync Design task pane, select **Prestage Timing Devices > Discover Timing Devices**.



Field	Field Description
Ok	To discover the devices in the Timing database, click Ok . All the timing devices present in the Network Application platform are discovered and listed.
Cancel	To cancel the discovery of devices in the Timing database, click Cancel . The existing Sync Design devices are listed.

Managing Timing Devices

After discovering the timing devices, double-click a timing device to view its details. The **Timing Device Details** window has two tabs:

- The **General** tab lists the following details:

Field	Field Description
Name	Name of the device.
OS version	Version of the device's operating system.
Platform	Platform type of the device.
Management IP	IP address of the device.
Connection status	Connection status of the device: <ul style="list-style-type: none">• up• down
Service Type	Service type of the device: <ul style="list-style-type: none">• PTP• SyncE

- The **Interface** tab lists the following details:

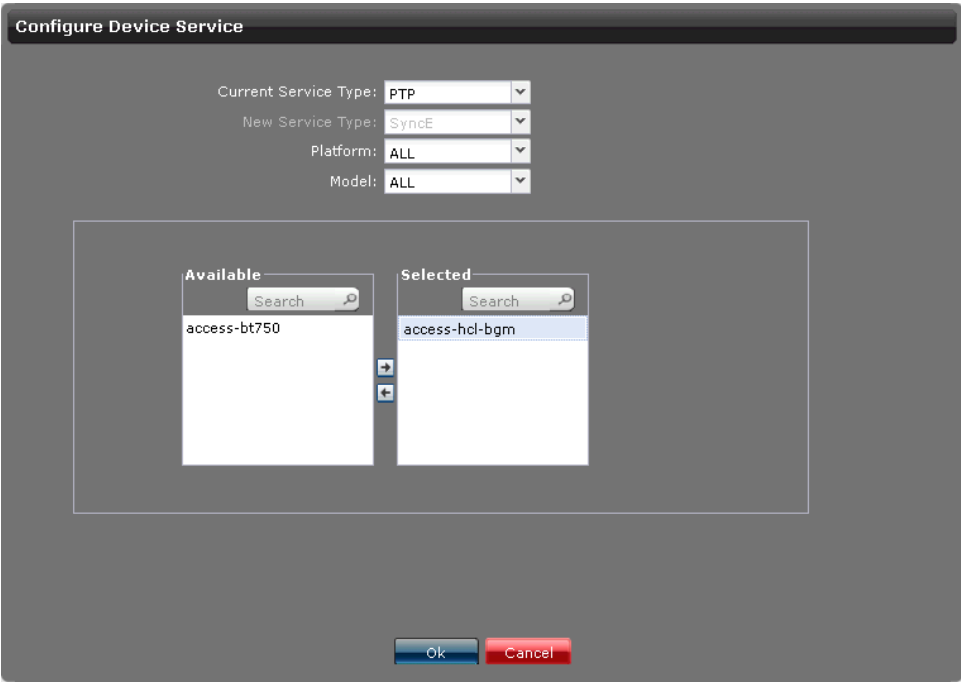
Field	Field Description
Interface Name	Name of the interface.
IP Address	IP address of the interface.

- Related Documentation**
- [Sync Design Application Overview on page 3](#)
 - [Configuring Device Service on page 12](#)

Configuring Device Service

To configure a service on a device, in the Sync Design task pane, select **Prestage Timing Devices > Manage Timing Devices > Configure Device Service**.

1. Click **Configure Device Service**. The **Configure Device Service** window is displayed.



2. Fill in the following fields:

Field	Action
Current Service Type	Select a service: <ul style="list-style-type: none">• PTP• SyncE Default: PTP
New Service Type	The option displayed in this field is based on the service selected in Current Service Type . If the Current Service Type is PTP, then the New Service Type is Synchronous Ethernet.
Platform	Select the platform: <ul style="list-style-type: none">• ALL—Includes both TCA and ACX platforms• TCA—TCA platform• ACX—ACX platform Default: ALL
Model	Select the model for the platform that you have selected. NOTE: The options in the Model list depends on the type of platform selected in the Platform field. By default, all the models are listed.
Available	Select a device from the list box. NOTE: The devices list here are of the service type specified in the Current Service Type .
Selected	To configure a device with the new service type, select a device from the Available and click the right arrow button to move it to the Selected list box.

3. Click **Ok** to associate the new service to a device.

The service is now configured on the selected device.

Related Documentation

- [Sync Design Application Overview on page 3](#)
- [Discovering and Managing Timing Devices on page 11](#)

Adding Unmanaged Devices

In the Junos Space context, unmanaged devices are those made by vendors other than Juniper Networks, Inc. You can add such devices to Junos Space in one of the following methods:

- [Adding an Unmanaged Device Using a CSV File on page 14](#)
- [Adding an Unmanaged Device Manually on page 15](#)

Adding an Unmanaged Device Using a CSV File

To add a non-Juniper device or multiple devices to Junos Space using a CSV file:

1. Select **Sync Design > Devices > Unmanaged Devices**.

The Add Unmanaged Devices page appears.

2. Select the **Import from CSV** option button.

The **Import** area appears, displaying the following links:

- **View Sample CSV**— Displays a CSV file with the format shown in [Table 3 on page 14](#).
- **Select a CSV file to Upload**— Click to upload the CSV file.

3. Click the **View Sample CSV** link to download a sample CSV file.

Fill in the sample CSV file with the format shown in [Table 3 on page 14](#)

Table 3: Sample CSV for Importing Unmanaged Devices

Column Heading	Sample Data	Field Constraints
Host Name or IP Address	Sunnyvale_R1	Name: Limit of 256 characters, no spaces. IP address: Dotted decimal notation.
Vendor	Cisco Systems	Alphabetic characters only
SNMP Version	SNMPV3	SNMPv3, or SNMPv1 or v2C
Community	N/A (for SNMP V3)	Community string (authentication password) for V2; otherwise, N/A
Username	admin	
Authentication Type	MD5	MD5, SHA1, or N/A

Table 3: Sample CSV for Importing Unmanaged Devices (*continued*)

Column Heading	Sample Data	Field Constraints
Authentication Password	admin123	Must have at least eight characters and can include alphanumeric and special characters, but not control characters
Privacy Type	DES	DES, AES128, or N/A
Privacy Password	admin123	Must have at least eight characters and can include alphanumeric and special characters, but not control characters. Can be same as authentication password, or different.

Save the CSV file.

- Click the **Select a CSV file to Upload** link. The **Select a CSV file** window appears.
- Click **Browse** to select the file you want to upload.
- Click **Upload** to upload the CSV file.

You can view this unmanaged device in the **Device Management** inventory page. The unmanaged devices are also listed in the **Timing Provisioning > Create PTP Order > Device Assignment > Master Device List**.

Adding an Unmanaged Device Manually

To add an unmanaged device to Junos Space manually:

- Select **Sync Design > Devices > Unmanaged Devices**.
The Add Unmanaged Devices page appears.
- Select the **Add Manually** option button.
The Device Details area appears.
- Select **Host Name** or **IP Address**.
The first box changes to represent your selection. Enter the appropriate name or address value for the device.
- (Optional) In the **Vendor** box, type the name of the device's vendor.
The maximum length is 256 characters. Spaces are acceptable.
- Select the **SNMP** box if you want to use SNMP to gather device information.
If you do so, the SNMP Settings area appears.
- Select either **SNMP V1/V2C** or **SNMP V3**.
 - If you select **SNMP V1/V2C**, the Community box appears. Type the appropriate SNMP community string (password) to give access to the device.
 - If you select **SNMP V3**, several boxes appear, as described in [Table 4 on page 16](#). Type values as appropriate.

Table 4: SNMP V3 Configuration Parameters

Field	Action
Username	Type the user name previously configured on the device.
Authentication type	Select the algorithm used for authentication: MD5, SHA1, or None. MD5 or SHA1 is used to create a hash of the authentication password. Note that only this password is encrypted, not any other packets transmitted.
Authentication password	Type the password that authenticates Junos Space to the device to gain access to it. The password must have at least eight characters and can include alphanumeric and special characters, but not control characters.
Privacy type	Select the encryption algorithm: AES128, DES, or None, used to encrypt transmitted packets.
Privacy password	Type the password that allows reading the transmissions themselves. The password must have at least eight characters.

7. Click **Next** to view the device details in table format.

8. Click **Finish** to add the unmanaged device.

You can view this unmanaged device in the **Device Management** inventory page. The unmanaged devices are also listed in the **Timing Provisioning > Create PTP Order > Device Assignment > Master Device List**.

**Related
Documentation**

- [Unmanaged Grandmaster Devices Overview on page 5](#)
- [Provisioning an Unmanaged Grand Master Device on page 48](#)

CHAPTER 3

Managing Sync Design Service Definitions

- [Creating a PTP Service Definition on page 17](#)
- [Creating a Synchronous Ethernet Definition on page 27](#)

Creating a PTP Service Definition

To create a Precision Timing Protocols (PTP) service definition, in the Sync Design task pane, select **Timing Design > Manage Timing Definitions > Create PTP Service Definition**.

1. [Configuring the General Tab on page 17](#)
2. [Configuring the PTP-Master Tab on page 19](#)
3. [Configuring the PTP-Slave Tab on page 22](#)
4. [Configuring the Timing Tab on page 25](#)

Configuring the General Tab

The screenshot shows the 'General' tab of a configuration interface. It is divided into two main sections: 'General Settings' and 'Common Settings'.

General Settings:

- Name:** A text input field containing 'PTP-definition'.
- Comments:** A large, empty text area for additional notes.

Common Settings:

- Topology:** A dropdown menu set to 'Ordinary'.
- IPv4 DSCP:** A text input field containing '56'.
- Transport mode:** A dropdown menu set to 'Unicast'.
- Transport encapsulation:** A dropdown menu set to 'IPv4'.

On the right side of the 'Common Settings' section, there are four checkboxes, all of which are currently unchecked:

- ☐ Editable in Service Order
- ☐ Editable in Service Order
- ☐ Editable in Service Order
- ☐ Editable in Service Order

To configure general and common settings of a PTP definition:

1. Fill in the fields on the **General** tab.

Field	Action
Name	Specify the name of the PTP service definition. Range: 0 through 50 characters. Special characters and space are not allowed.
Comments	Type a comment that describes the PTP service definition. Range: 0 through 200 characters. Special characters and space are allowed.
Topology	Select the topology: <ul style="list-style-type: none"> • Ordinary—The clock mode of the node is a system clock where the clock acts either as a source (master) or as a destination (slave). • Boundary—The clock mode of the node is a boundary clock where the clock acts as both source (master) and destination (slave).
IPv4 DSCP	Specify an integer. Range: 0 through 63 Default: 46
Transport mode	Select the required value: <ul style="list-style-type: none"> • Unicast—One-to-one, from one source to one destination. • Multicast—One-to-many, from one source to multiple destinations expressing an interest in receiving the traffic. <p>NOTE: Both the ordinary clock and the boundary clock support the multicast mode. Multicast transport mode is supported only in ACX Series devices.</p> <p>This field is not editable in the service order.</p>
Transport encapsulation	Select the type of transport encapsulation: <ul style="list-style-type: none"> • IPv4, if the Transport mode is Unicast • IEEE-802.3, if the Transport mode is Multicast • IEEE-802.3 Link Local, if the Transport mode is Multicast
Enable PTP Resiliency	This field is available if the Transport mode is Multicast and the Topology is Boundary . Select this check box to enable PTP resiliency.

If a field has to be modified in the service order, select the **Editable in Service Order** check box.

2. Click **Next**.

The **PTP-Master** tab appears.

Field	Action
Sync rate	Select a synchronous interval rate: <ul style="list-style-type: none">• 1 packet/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec Default: 64 packets/sec
Priority 1	Specify an integer. Range: 0 through 255
Priority 2	Specify an integer. Range: 0 through 255
Announce rate	Select an announce rate value: <ul style="list-style-type: none">• 1 packet/sec• 1 packet/2 sec• 1 packet/4 sec• 1 packet/8 sec Default: 1 packet/8 sec
Delay request rate	Select a delay request rate value: <ul style="list-style-type: none">• 1 packet/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec Default: 1 packet/sec
Announce receipt timeout	Select an announce receipt timeout value. Range: 2 through 10 seconds Default: 2 seconds
Continuous ARP	Select the check box to enable continuous ARP.

Field	Action
Signaling	<p>If you want to configure signaling, select the Signaling check box to enable the following fields:</p> <ul style="list-style-type: none"> • Delay rate • Announce rate • Sync rate
Delay rate	<p>Select one of the following values in the Min and Max boxes:</p> <ul style="list-style-type: none"> • 1 packet/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: Min: 1 packet/sec; Max: 64 packets/sec</p> <p>NOTE: Ensure that the value specified in Min is less than or equal to the value specified for Max.</p>
Announce rate	<p>Select one of the following values in the Min and Max boxes:</p> <ul style="list-style-type: none"> • 1 packet/sec • 1 packet/2 sec • 1 packet/4 sec • 1 packet/8 sec <p>Default: Min: 1 packet/8 sec; Max: 1 packet/sec</p> <p>NOTE: Ensure that the value specified in Min is less than or equal to the value specified for Max.</p>
Sync rate	<p>Select one of the following values in the Min and Max boxes:</p> <ul style="list-style-type: none"> • 1 packet/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: Min: 1 packet/sec; Max: 64 packets/sec</p> <p>NOTE: Ensure that the value specified in Min is less than or equal to the value specified for Max.</p>

If a field has to be modified in the service order, select the **Editable in Service Order** check box.

2. Click **Next**.

The **PTP-Slave** tab appears.

Configuring the PTP-Slave Tab

PTP - Slave

Profile: Telecom Profile

Delay request rate: 64 packets/sec

Announce receipt timeout: 2

☒ Enable Hybrid

☐ Editable in Service Order

☐ Editable in Service Order

☐ Editable in Service Order

☐ Editable in Service Order

Signaling Configuration

☒ Signaling

Grant duration (sec): 300

Sync rate: 64 packets/sec

Announce rate: 1 packet/sec

☐ Editable in Service Order

☐ Editable in Service Order

☐ Editable in Service Order

☐ Editable in Service Order

PTP - ESMC Mapping

☒ Enable Clock Class Mapping

Network option: Option-1

Minimum Quality level: PRC

Clock class: 80

☐ Editable in Service Order

☒ Editable in Service Order

☐ Editable in Service Order

☐ Editable in Service Order

To continue configuring the PTP definition:

- 1. Fill in the fields on the **PTP-Slave** tab.

Field	Action
Profile	<div>If you have set the Transport mode in the General tab to Unicast, select a profile:</div> <ul style="list-style-type: none">• Default• Juniper Type I• Telecom Profile <div>NOTE: If you have selected the Telecom Profile, in the PTP-Master tab the Profile type must be Telecom Profile.</div> <div>If you have set the Transport mode in the General tab to Unicast, the Profile type is Default.</div>
Delay request rate	<div>Select a delay request rate value:</div> <ul style="list-style-type: none">• 1 packet/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec <div>Default: 64 packets/sec</div>

Field	Action
Announce receipt timeout	<p>Select an announce receipt timeout.</p> <p>Range: 2 through 10 seconds</p> <p>Default: 2 seconds</p>
Enable Hybrid	Select this check box if you want to enable Hybrid Mode on MX Series and ACX Series devices.
Signaling	<p>If you want to configure signaling, select the Signaling check box to enable the following fields:</p> <ul style="list-style-type: none"> • Grant duration (sec) • Sync rate • Announce rate
Grant duration (sec)	<p>Select a grant duration.</p> <p>Range: 0 through 3600 seconds</p> <p>Default: 300 seconds</p>
Sync rate	<p>Select a synchronous interval value:</p> <ul style="list-style-type: none"> • 1 packet/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: 64 packets/sec</p>
Announce rate	<p>Select an announce interval value:</p> <ul style="list-style-type: none"> • 1 packet/sec • 1 packet/2 sec • 1 packet/4 sec • 1 packet/8 sec <p>Default: 1 packet/8 sec</p>
Enable Clock Class Mapping	<p>If you want to configure the clock class, select the Enable Clock Class Mapping check box to enable the following fields:</p> <ul style="list-style-type: none"> • Network option • Minimum Quality level • Clock class

Field	Action
Network option	<p>Select a network option:</p> <ul style="list-style-type: none"> Option-1—Option 1 (EEC1) synchronization networking. Ethernet Equipment Clock 1 (EEC1) maps to G.813 option 1. Option-2—Option 2 (EEC2) synchronization networking. Ethernet Equipment Clock 2 (EEC2) maps to G.812 type IV clock.
Minimum Quality level	<p>Select the minimum quality level. The option displayed in the list is based on the type of Network option selected.</p> <p>For Option-1:</p> <ul style="list-style-type: none"> PRC—Timing quality of a primary reference clock (PRC) SEC—Timing quality of SDH equipment clock (SEC) SSU-A—Timing quality of a type I or type IV slave clock SSU-B—Timing quality of a type VI slave clock <p>For Option-2:</p> <ul style="list-style-type: none"> PRS—Clock traceable to primary reference source (PRS) SMC—Clock traceable to self-timed SONET ST2—Clock traceable to stratum 2 ST3—Clock traceable to stratum 3 ST3E—Clock traceable to stratum 3E ST4—Clock traceable to stratum 4 free-run STU—Clock traceable to unknown quality TNC—Clock traceable to transit node clock
Clock class	<p>Specify the clock class.</p> <p>Range: 80 through 109</p> <p>Default: 80</p>

If a field has to be modified in the service order, select the **Editable in Service Order** check box.

2. Click **Next**.

The **Timing** tab appears.

Configuring the Timing Tab

The screenshot shows the 'Timing' configuration tab. It is divided into two main sections: 'Grand Master' and 'Slave'.

Grand Master Section:

- IRIG-B:** A dropdown menu with 'B000' selected.
- Frequency:** A dropdown menu with '1 MHz' selected.
- Delay compensation:** A text input field with '0'.
- Sync source:** A section containing two lists: 'Available' (GPS, T1/E1, PTP, Internal) and 'Selected' (empty). There are right and left arrow buttons between the lists. To the right of the 'Selected' list is a checkbox labeled 'Editable in Service Order'.

Slave Section:

- PPS:** A dropdown menu with 'PPS' selected.
- Frequency:** A dropdown menu with '1 MHz' selected.
- Offset compensation:** A text input field with '0'.
- Time of day:** A section containing:
 - Baud rate:** A dropdown menu with '1200' selected.
 - Format:** A dropdown menu with 'Calendar' selected.
- Sync source:** A section containing two lists: 'Available' (PTP, Internal) and 'Selected' (empty). There are right and left arrow buttons between the lists. To the right of the 'Selected' list is a checkbox labeled 'Editable in Service Order'.

To complete configuring the PTP definition:

1. Fill in the fields on the **Timing** tab.

Field	Action
IRIG-B	<p>Select an IRIG-B value:</p> <ul style="list-style-type: none"> • B001 • B002 • B003 • B120 • B121 • B122 • B123 <p>Default: B001</p>

Field	Action
Frequency	<p>Select the Master's frequency:</p> <ul style="list-style-type: none"> • 1 MHz • 5 MHz <p>Default: 1MHz</p>
Delay compensation	<p>Specify the delay compensation.</p> <p>Range: -1000000 through 1000000 nanoseconds</p> <p>Default: 0 nanosecond</p>
Sync source	<p>Select the sync source for the master device from the Available list box. Click the right arrow button to move it to the Selected list box. The order in the Selected list decides the priority of sync source. The top one has highest priority.</p>
PPx	<p>Select a PPx value:</p> <ul style="list-style-type: none"> • PPS • PP2S • PPM • PPH
Frequency	<p>Select the PTP slave's frequency:</p> <ul style="list-style-type: none"> • 1 MHz • 5 MHz • 10 MHz <p>Default: 1 MHz</p>
Offset compensation	<p>Specify the offset compensation.</p> <p>Range: -1000000 through 1000000 nanoseconds</p> <p>Default: 0 nanosecond</p>
Baud rate	<p>Select a baud rate:</p> <ul style="list-style-type: none"> • 1200 • 2400 • 4800 • 9600 • 19200 <p>Default: 1200</p>
Format	<p>Select a time format. This field represents the time of day (TOD):</p> <ul style="list-style-type: none"> • Calendar--Calendar format • TAI--International atomic time (TAI) format

Field	Action
Sync source	Select the sync source for the slave device from the Available list box. Click the right arrow button to move it to the Selected list box. The order in the Selected list decides the priority of sync source. The top one has highest priority.

If a field has to be modified in the service order, select the **Editable in Service Order** check box.

2. Click **Create**.

The PTP Service Definition is saved in the database.

Related Documentation

- [Sync Design Application Overview on page 3](#)
- [Precision Timing Protocol \(PTP\) over Ethernet on ACX Series Universal Access Routers on page 7](#)
- [Creating a Synchronous Ethernet Definition on page 27](#)
- [Creating a PTP Timing Service Order on page 31](#)
- [Understanding Hybrid Mode](#)
- [Managing Timing Definitions on page 53](#)

Creating a Synchronous Ethernet Definition

To create a Synchronous Ethernet service definition, in the Sync Design task pane, select **Timing Design > Manage Timing Definitions**.

1. Click **Create SyncE Definition**. The **Create SyncE Definition** window is displayed.

2. Fill in the following fields:

Field	Action
Name	Specify the name of the Synchronous Ethernet definition. Range: 0 through 50 characters. Special characters and space is not allowed.
Comments	Enter a comment that describes the Synchronous Ethernet definition. Range: 0 through 200 characters. Special characters and space is allowed.
Network option	Select a network option: <ul style="list-style-type: none"> Option-1—Option 1 (EEC1) synchronization networking. Ethernet Equipment Clock 1 (EEC1) maps to G.813 option 1. Option-2—Option 2 (EEC2) synchronization networking. Ethernet Equipment Clock 2 (EEC2) maps to G.812 type IV clock.
Clock mode	By default, the clock source for the system clock and external interfaces is Auto.
Enable quality mode	Select the check box to enable the quality mode.

Field	Action
Source selection mode	<p>Select a source selection mode:</p> <ul style="list-style-type: none"> Configured Quality Received Quality
Config change (sec)	<p>Specify the configuration change value.</p> <p>NOTE: The clock selection algorithm is started after the duration specified here.</p> <p>Range: 15 through 60 seconds</p> <p>Default: 15 seconds</p>
Restart (sec)	<p>Specify the restart value.</p> <p>NOTE: Before starting the clock selection, the clock selection algorithm waits for the duration specified here.</p> <p>Range: 60 through 180 seconds</p> <p>Default: 120 seconds</p>
Switchover (sec)	<p>Specify the switchover value. It is the time interval after which switch reverts back to primary configuration.</p> <p>Range: 30 through 60 seconds</p> <p>Default: 30 seconds</p>
Switchover mode	<p>Select a switchover mode :</p> <ul style="list-style-type: none"> Revertive Non-Revertive
Quality level	<p>Select the quality level. The option displayed in the list is based on the type of Network option selected.</p> <p>For Option-1:</p> <ul style="list-style-type: none"> PRC—Timing quality of a primary reference clock (PRC) SEC—Timing quality of SDH equipment clock (SEC) SSU-A—Timing quality of a type I or type IV slave clock SSU-B—Timing quality of a type VI slave clock <p>For Option-2:</p> <ul style="list-style-type: none"> PRS—Clock traceable to primary reference source (PRS) SMC—Clock traceable to self-timed SONET ST2—Clock traceable to stratum 2 ST3—Clock traceable to stratum 3 ST3E—Clock traceable to stratum 3E ST4—Clock traceable to stratum 4 free-run STU—Clock traceable to unknown quality TNC—Clock traceable to transit node clock

Field	Action
Priority	Select a priority. Range: 1 through 5 Default: 1
Wait to restore (min)	Specify the wait to restore value. When a clock source recovers from the signal failure conditions, the clock source is again considered for clock selection algorithm after the time duration specified here. Range: 0 through 15 minutes Default: 5 minutes
Override	Select an override value: <ul style="list-style-type: none"> • Default—Device selects the input source • Lockout—Source is not considered for selection process • Force switch—Force clock selection process

If a field has to be modified in the service order, select the **Editable in Service Order** check box.

3. Click **Create**. The Synchronous Ethernet Definition is saved in the database.

Related Documentation

- [Sync Design Application Overview on page 3](#)
- [Creating a PTP Service Definition on page 17](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Managing Timing Definitions on page 53](#)

CHAPTER 4

Managing Sync Design Service Orders

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Provisioning an Unmanaged Grand Master Device on page 48](#)

Creating a PTP Timing Service Order

To create a Precision Timing Protocols (PTP) service order, in the Sync Design task pane, select **Timing Provisioning > Manage Timing Orders > Create PTP Orders**.

- [Configuring the General Page on page 31](#)
- [Configuring the Device Assignment Page on page 33](#)
- [Configuring the PTP-Grandmaster Page on page 34](#)
- [Configuring the PTP-Slave Page on page 38](#)
- [Configuring the Timing Page on page 41](#)

Configuring the General Page

The screenshot displays the 'PTP - General' configuration page. It is divided into two main sections: 'General Settings' and 'Common Settings'.

General Settings:

- PTP definition:** A dropdown menu set to 'PTP_SD'.
- Name:** A text field containing 'PTP-SO'.
- Comments:** A large, empty text area.
- PTP domain:** A text field containing '1'.

Common Settings:

- Topology:** A dropdown menu set to 'Ordinary'.
- IPv4 DSCP:** A text field containing '56'.
- Transport mode:** A text field containing 'Unicast'.
- Transport encapsulation:** A dropdown menu set to 'IPv4'.

To configure general and common settings of a PTP order:

1. Fill in the fields on the **General** page as indicated in the table.

Field	Action
PTP definition	Select the PTP service definition from the list.
Name	Type the name of the PTP service order. Range: 3 through 50 characters. Special characters and spaces are not allowed.
Comments	Type a comment that describes the PTP service order. Range: 0 through 200 characters. Special characters and spaces are allowed.
PTP domain	Type the domain identifier for the timing network you want to build. Range: 1 through 255 Default: 1
Topology	Select the clock type: <ul style="list-style-type: none"> • Ordinary Clock—The clock mode of the node is a system clock where the clock acts either as a source (master) or as a destination (slave). • Boundary Clock—The clock mode of the node is a boundary clock where the clock acts as both source (master) and destination (slave). Default: The value displayed here is based on the service definition selected. NOTE: In the View Service Order window, you can distinguish a device in the PTP-Master and PTP-Slave tabs. A new column Type is added in the Configuration per master to identify if a device is of type <i>Boundary Clock (Master)</i> , <i>Grand Master</i> , or <i>Hybrid</i> .
Transport mode	This field is not editable in the service order.
Transport Encapsulation	Modify the type of transport: <ul style="list-style-type: none"> • IPv4, if the Transport Mode is Unicast • IPv6, if the Transport Mode is Unicast • IEEE-802.3, if the Transport Mode is Multicast NOTE: The Transport Encapsulation for multicast mode is not editable in the service order.
IPv4 DSCP	Specify a value for IPv4 DSCP . Range: 0 through 63 Default: The value displayed here is based on the service definition selected.

2. Click **Next**. The **Device Assignment** page appears.

Configuring the Device Assignment Page

Create PTP Order

Device Assignment

Master device list

Available

access1-hcl-bgm

Selected

Boundary device list

Available

fortius-f1100-a
fortius-f2100-b
fortius-f4000-a
junos-mx240-space
junos-space1
kochin

Selected

fortius-f2100-a

Slave device list

Available

access1-bt750
access3-bt750
access4-bt750
access5-bt750
fortius-f1100-a
fortius-f2100-a
fortius-f2100-b

Selected

access-bt750

To continue to assign a device to a PTP order:

1. Fill in the fields on the **Device Assignment** page as indicated in the table.

Field	Action
Master Device List	Select a device from the Available and click the right arrow button to move it to the Selected list box. You can also provision an unmanaged device as source (master) device. For more information on unmanaged devices, see “Provisioning an Unmanaged Grand Master Device” on page 48 .

Field	Action
Boundary Device List	<p>Select a device from the Available and click the right arrow button to move it to the Selected list box.</p> <p>NOTE: This is available if you have selected the Clock Type as Boundary Clock.</p> <p>For more information on boundary clock, see "Boundary Clock Overview" on page 5.</p>
Slave Device List	<p>Select a device from the Available and click the right arrow button to move it to the Selected list box.</p>



NOTE: The devices selected here are the part of configured PTP domain.

2. Click **Next**.

If the **Selected Grandmaster** list box contains an unmanaged device only, the **PTP - Slave** page appears.

If the **Selected Grandmaster** list box contains an unmanaged device along with Junos Space managed device, the **PTP - Grandmaster** page appears.

Configuring the PTP-Grandmaster Page



NOTE: This page is unavailable if the **Selected Grandmaster** list box in the **Device Assignment** page contains an unmanaged device only.

Create PTP Order

PTP - Master

Profile: Telecom Profile

Two step

Sync rate: 64 packets/sec

Announce rate: 1 packet/8 sec

Delay request rate: 64 packets/sec

Announce receipt timeout: 2

Continuous ARP

Signaling Configuration

Signaling

Delay rate: Min: 1 packet/sec Max: 64 packets/sec

Announce rate: Min: 1 packet/sec Max: 1 packet/8 sec

Sync rate: Min: 1 packet/sec Max: 64 packets/sec

Configuration per master

Selection

Selected master: junos-mx240-space

Priority 1: 128

Priority 2: 128

Interface(s):

☐ ge-0/0/1.0
☐ ge-0/0/2.0
☐ ge-0/0/3.1
☐ ge-0/0/3.2
☐ ge-0/0/3.3

Stateful interface(s):

Add/Update

Configured

Device Name	Priority 1	Priority 2	Interface(s)	Stateful Interface(s)
access1-hd-bgm	128	128	eth0	N/A
fortius-f2100-b	128	128	ge-1/0/2.0	N/A
junos-mx240-space	128	128	ge-0/0/2.0 ge-0/0/3.1 ge-0/0/3.2	N/A

Delete

To continue to configure a PTP order:

1. Fill in the fields on the **PTP-Grand Master** page as indicated in the table.

Field	Action
Profile	<p>If you have set the Unicast Mode in the General page to Yes, the Profile type value displayed here is based on the service definition selected.</p> <p>If you have set the Unicast Mode in the General page to No, the Profile type is Default.</p> <p>NOTE: You can revise the Profile type value only if you have selected the Editable in Service Order check box in the respective service definition.</p>
Two step	<p>Select the check box to enable PTP two-step clock.</p> <p>Default: The value displayed here is based on the service definition selected.</p>

Field	Action
Sync rate	<p>Select a synchronous interval value:</p> <ul style="list-style-type: none">• 1 packets/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p>
Announce rate	<p>Select a announce interval value:</p> <ul style="list-style-type: none">• 1 packet/sec• 1 packet/2 sec• 1 packet/4 sec• 1 packet/8 sec <p>Default: The value displayed here is based on the service definition selected.</p>
Delay request rate	<p>Select a delay interval value:</p> <ul style="list-style-type: none">• 1 packets/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p>
Announce receipt timeout	<p>Select a value:</p> <p>Field length: 2 through 10 seconds</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Continuous ARP	<p>Select the check box to enable continuous ARP.</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Signaling	<p>Select this check box to activate the following fields:</p> <ul style="list-style-type: none">• Delay Interval Range• Announce Interval Range• Sync Interval Range <p>Default: The value displayed here is based on the service definition selected.</p>

Field	Action
Delay rate	<p>Select:</p> <ul style="list-style-type: none"> • 1 packets/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p> <p>NOTE: Ensure that the value specified in Min is less than or equal to the value specified in the Max.</p>
Announce rate	<p>Select:</p> <ul style="list-style-type: none"> • 1 packet/sec • 1 packet/2 sec • 1 packet/4 sec • 1 packet/8 sec <p>Default: The value displayed here is based on the service definition selected.</p> <p>NOTE: Ensure that the value specified in Min is lesser than or equal to the value specified in the Max.</p>
Sync rate	<p>Select:</p> <ul style="list-style-type: none"> • 1 packets/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p> <p>NOTE: Ensure that the value specified in Min is lesser than or equal to the value specified in the Max.</p>
Selected masters	<p>Select the source (master) device from the list. The list displays the source (master) devices that you have selected in the Device Assignment page.</p> <p>NOTE: Because the boundary clock can act as both the source (master) device and destination (slave) device, this list includes the devices that you have selected from Boundary Device List.</p>
Priority 1	<p>Modify the value.</p> <p>Range: 0 through 255</p> <p>Default: The value displayed here is based on the service definition selected.</p> <p>NOTE: This field is unavailable if the Selected masters is an unmanaged device.</p>

Field	Action
Priority 2	<p>Modify the value.</p> <p>Range: 0 through 255</p> <p>Default: The value displayed here is based on the service definition selected.</p> <p>NOTE: This field is unavailable if the Selected masters is an unmanaged device.</p>
Interface	Select an interface.
Add/Update	<p>Click Add/Update to update the Configured table. If there is a combination of a managed and unmanaged grand master devices, by default, the unmanaged grand master device is populated in the Configured table.</p> <p>NOTE: To delete a configuration, select a row and click Delete.</p>

- Click **Next**. The **PTP - Slave** page appears.

Configuring the PTP-Slave Page

Create PTP Order

PTP - Slave

Profile: Telecom Profile

Delay request rate: 64 packets/sec

Announce receipt timeout: 2

Signaling Configuration

☒ Signaling

Grant duration (sec): 300

Sync rate: 64 packets/sec

Announce rate: 1 packet/sec

PTP-ESMC mapping

☐ Enable clock class mapping

Network option: Option-1

Quality level: PRC

Clock class: 80

Configuration per slave

Selection

Selected slave: fortius-f2100-a

Interface: ge-1/0/1.0

Acceptable master(s):

Device Name	Interface	Type
<input checked="" type="checkbox"/> 10.10.10.10	N/A	GM

Add/Update

Configured

Device Name	Interface	Acceptable Master(s)	Master Interface(s)
access4-bt750	eth0	10.10.10.10	N/A
fortius-f1100-a	ge-0/0/3.0	10.10.10.10	N/A
fortius-f2100-a	ge-1/0/1.0	10.10.10.10	N/A

Delete

To continue configuring the PTP service order:

1. Fill in the fields on the **PTP-Slave** page as indicated in the table.

Field	Action
Profile	<p>You can revise the Profile type value only if you have selected the Editable in Service Order check box in the respective service definition.</p> <p>If you have set the Unicast Mode in the General page to Yes, the Profile type value displayed here is based on the service definition selected.</p> <p>If you have set the Unicast Mode in the General page to No, the Profile type is Default.</p>
Delay request rate	<p>Select a value:</p> <ul style="list-style-type: none"> • 1 packets/sec • 2 packets/sec • 4 packets/sec • 8 packets/sec • 16 packets/sec • 32 packets/sec • 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p>
Announce receipt timeout	<p>Select a value:</p> <p>Field length: 2 through 10 seconds</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Enable Hybrid Mode	<p>This checkbox is visible only when the Transport mode is set to unicast in the General window.</p> <p>NOTE: Multicast Mode is not supported on MX systems.</p>
Signaling	<p>Select this check box if you want to activate these fields:</p> <ul style="list-style-type: none"> • Grant Duration (sec) • Sync rate • Announce rate <p>Default: The value displayed here is based on the service definition selected.</p>
Grant Duration (sec)	<p>Select a value from the Grant Duration text box:</p> <p>Field length: 0 through 3600 seconds</p> <p>Default: The value displayed here is based on the service definition selected.</p>

Field	Action
Sync rate	<p>Select a value:</p> <ul style="list-style-type: none">• 1 packets/sec• 2 packets/sec• 4 packets/sec• 8 packets/sec• 16 packets/sec• 32 packets/sec• 64 packets/sec <p>Default: The value displayed here is based on the service definition selected.</p>
Announce rate	<p>Select an announce rate value:</p> <ul style="list-style-type: none">• 1 packet/sec• 1 packet/2 sec• 1 packet/4 sec• 1 packet/8 sec <p>Default: The value displayed here is based on the service definition selected.</p>
Enable Clock Class	<p>NOTE: On selecting the Selected slaves, fill in the fields for PTP-ESMC Mapping.</p> <p>If you want to configure the clock class, select the Enable Clock Class check box to enable the following fields:</p> <ul style="list-style-type: none">• Network option• Quality level• Clock class <p>NOTE: This field is available only if an ACX device is selected.</p>
Selected slaves	<p>Select a device from the list.</p> <p>NOTE: The list displays the destination (slave) devices that you have selected in the Device Assignment page.</p> <p>When user selects as boundary clock in "Selected Slave", user can select clock source as GM or Boundary Clock (excluding itself in case of multiple Boundary clocks).</p>
Interface	<p>Select a PTP interface for the selected destination (slave) device.</p>

Field	Action
Acceptable Master(s)	<p>Select the unicast source (master) device for the selected destination (slave) from the list.</p> <p>The Acceptable Master(s) table displays the source (master) devices that you have selected in the Device Assignment page.</p> <p>This table has the following columns:</p> <ul style="list-style-type: none"> • Device—Select the source (master) device. NOTE: For each destination (slave) device you can add a maximum of two source (master) devices. • Interface—Select a PTP interface for the selected source (master) device. NOTE: The interface you select is displayed in the Master Interface row of the Configured table. • Type—Displays the clock type of the source (master) device. NOTE: Because the boundary clock can act as both the source (master) device and destination (slave) device, this list includes the devices that you have selected from Boundary Device List.
Add/Update	<p>Click Add/Update to update the Configured table.</p> <p>NOTE: To delete a configuration, select a row and click Delete.</p>

2. Click **Next**. The **Timing** page appears.

Configuring the Timing Page

To complete configuring the PTP order:

Create PTP Order

Timing

Grand Master

IRIG-B: B000

Frequency: 1 MHz

Delay compensation: 0

Sync source

Available

GPS

T1/E1

PTP

Internal

Selected

Slave

PPx: PPS

Frequency: 1 MHz

Offset compensation: 0

Time of day

Baud rate: 1200

Format: Calendar

Sync source

Available

PTP

Internal

Selected

1. Fill in the fields on the **Timing** page as indicated in the table.

Field	Action
Grand Master	
<p>NOTE: The Grand Master box is unavailable if the Selected Grandmaster list box in the Device Assignment page contains an unmanaged device only.</p>	

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Field	Action
IRIG-B	<p>Select a value:</p> <ul style="list-style-type: none"> • B001 • B002 • B003 • B120 • B121 • B122 • B123 <p>Default: The value displayed here is based on the service definition selected.</p>
Frequency	<p>Select the grand master clock frequency:</p> <ul style="list-style-type: none"> • 1 MHz • 5 MHz <p>Default: The value displayed here is based on the service definition selected.</p>
Delay compensation	<p>Specify the delay compensation.</p> <p>Range: -1000000 through 1000000 nanoseconds</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Sync source	<p>Select the sync source for the source (master) device from the Available box. Click the right arrow button to move it to the Selected list box. The order in the Selected list decides the priority of sync source. The top one has highest priority.</p>
Slave	
PPx	<p>Select a value:</p> <ul style="list-style-type: none"> • PPS • PP2S • PPM • PPH
Frequency	<p>Select the PTP slave clock frequency:</p> <ul style="list-style-type: none"> • 1 MHz • 5 MHz • 10 MHz <p>Default: 1 MHz</p>
Offset compensation	<p>Specify the offset compensation.</p> <p>Range: -1000000 through 1000000 nanoseconds</p> <p>Default: The value displayed here is based on the service definition selected.</p>

Field	Action
Baud rate	Select a baud rate: <ul style="list-style-type: none"> • 1200 • 2400 • 4800 • 9600 • 19200
Format	Select a time format for the time of day: <ul style="list-style-type: none"> • Calendar--Calendar format • TAI--International atomic time format
Clock class	Specify the clock class Range: 80 through 109 Default: 80

2. Click **Create**. The PTP Timing service order is saved in the database.

Related Documentation

- [Discovering and Managing Timing Devices on page 11](#)
- [Creating a PTP Service Definition on page 17](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Deploying a Timing Service Order on page 60](#)
- [Validating a Timing Service Order on page 62](#)
- [Viewing Timing Service Order Details on page 59](#)

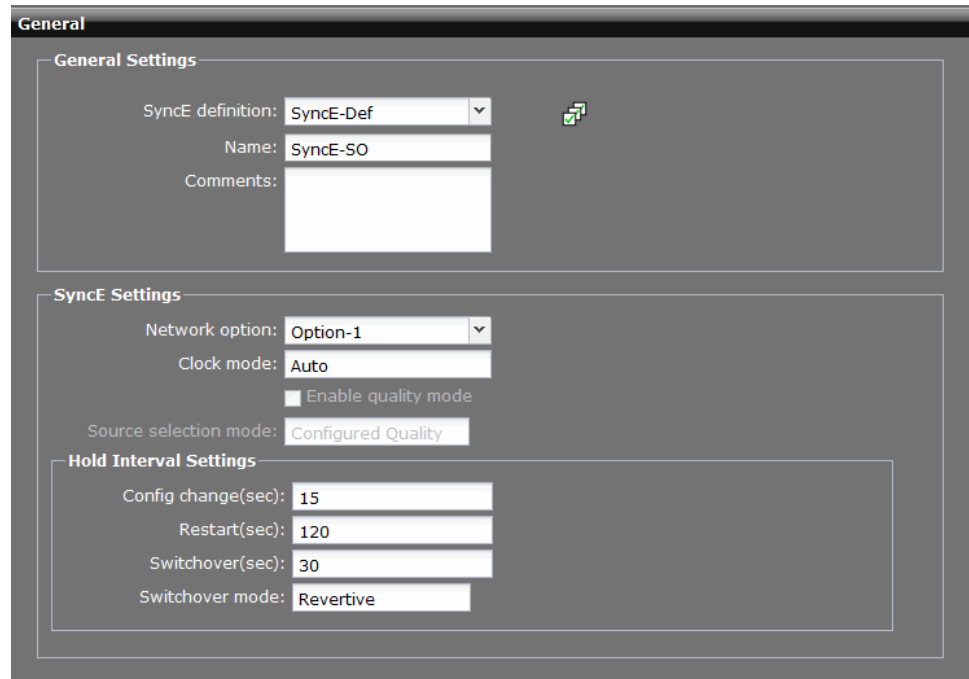
Creating a Synchronous Ethernet Timing Service Order

To create a Synchronous Ethernet service order perform the following tasks:

- [Configuring a Synchronous Ethernet Service Order General Tab on page 44](#)
- [Configuring a Synchronous Ethernet Service Order Input/Output Selection Tab on page 47](#)

Configuring a Synchronous Ethernet Service Order General Tab

In the Sync Design task pane, select **Timing Provisioning > Manage Timing Orders > Create SyncE Order**. The **Create SyncE Service** window is displayed.



General

General Settings

SyncE definition: SyncE-Def

Name: SyncE-SO

Comments:

SyncE Settings

Network option: Option-1

Clock mode: Auto

☐ Enable quality mode

Source selection mode: Configured Quality

Hold Interval Settings

Config change(sec): 15

Restart(sec): 120

Switchover(sec): 30

Switchover mode: Revertive

To configure general tab of a Synchronous Ethernet service order:

1. Fill in the fields on the **General** tab.

Field	Field Definition
SyncE definition	<p>Select the Synchronous Ethernet service definition for the list of definitions available in the database.</p> <p>The field values and editable option chosen in selected service definition is reflected in the corresponding field of the service order.</p>
Name	<p>Name of the Synchronous Ethernet service order.</p> <p>Range: 0 through 50 characters. Special characters and space are not allowed.</p>
Comments	<p>Enter a comment that describes the Synchronous Ethernet service order.</p> <p>Range: 0 through 200 characters. Special characters and space are allowed.</p>
Network option	<p>Select a network option:</p> <ul style="list-style-type: none"> • Option-1—Option 1 (EEC1) synchronization networking. Ethernet Equipment Clock 1 (EEC1) maps to G.813 option 1. • Option-2—Option 2 (EEC2) synchronization networking. Ethernet Equipment Clock 2 (EEC2) maps to G.812 type IV clock.

Field	Field Definition
Clock mode	By default, the clock source for the system clock and external interfaces is Auto.
Enable quality mode	<p>Select the check box to enable the quality mode.</p> <p>NOTE: You can enable or disable this field if you have selected the Editable in Service Order check box in the selected service definition.</p>
Source selection mode	<p>Select a source selection mode:</p> <ul style="list-style-type: none"> Configured Quality Received Quality <p>Default: The value displayed here is based on the service definition selected.</p>
Config change (sec)	<p>Specify the configuration change value.</p> <p>NOTE: The clock selection algorithm is started after the duration specified here.</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Restart (sec)	<p>Specify the restart value.</p> <p>NOTE: Before starting the clock selection, the clock selection algorithm waits for the duration specified here.</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Switchover (sec)	<p>Specify the switchover value.</p> <p>NOTE: The primary configuration is returned after the duration specified here.</p> <p>Default: The value displayed here is based on the service definition selected.</p>
Switchover mode	<p>Select a switchover mode:</p> <ul style="list-style-type: none"> Revertive Non-Revertive <p>Default: The value displayed here is based on the service definition selected.</p>

2. Click **Next**. The **Input/Output Selection** tab appears.

Configuring a Synchronous Ethernet Service Order Input/Output Selection Tab

To continue to configure an **Input/Output Selection** tab of the Synchronous Ethernet service order:

1. Fill in the fields on the tab.

Field	Action
Device list	Search for the device in Device List search box.
ESMC transmit per device	This field is enabled after selecting a device from the Device list . Select the interfaces from the list.
Interface Selection	<p>Select an interface for the device.</p> <ol style="list-style-type: none"> 1. Specify the following fields: <ul style="list-style-type: none"> • Interface <p>NOTE: This list does not include the interfaces selected in the ESMC transmit per device.</p> <ul style="list-style-type: none"> • Quality level • Override • Priority • Wait to restore 2. Click Add/Update <p>The interface is listed in the table below.</p>

2. Click **Finish**. The Synchronous Ethernet service order is saved in the database.

Related Documentation

- [Discovering and Managing Timing Devices on page 11](#)
- [Creating a Synchronous Ethernet Definition on page 27](#)
- [Creating a PTP Timing Service Order on page 31](#)
- [Deploying a Timing Service Order on page 60](#)
- [Validating a Timing Service Order on page 62](#)
- [Viewing Timing Service Order Details on page 59](#)

Provisioning an Unmanaged Grand Master Device

When interoperability with an unmanaged third-party device is necessary, you can use Junos Space to define the link between a Juniper Networks managed device and the third-party device.

To provision an unmanaged device:

1. Select **Timing Provisioning > Manage Timing Orders > Create PTP Orders**.

The **Create PTP Orders** window is displayed.

2. Fill in the fields on the **General** tab.

For more information on configuring the General tab, see [“Creating a PTP Timing Service Order” on page 31](#).

3. Click **Next** to configure the **Device Assignment** tab.
4. Select the source (master) device and destination (slave) device in the **Device Assignment** tab.
 - a. Select an unmanaged grandmaster device from the **Available** and click the right arrow button to move it to the **Selected** list box.



NOTE: The **Selected** list box can consist of a combination of managed and unmanaged devices.

- b. Select a device from the **Available** and click the right arrow button to move it to the **Selected** list box.
5. Click **Next**.

If the **Selected Grandmaster** list box contains an unmanaged device only, the **PTP - Slave** tab appears.

If the **Selected Grandmaster** list box contains an unmanaged device and a Junos Space managed device, the **PTP - Grandmaster** tab appears.

6. In the **PTP-Grandmaster device** tab, configure the grand master devices.
7. Click **Next** to configure the **PTP-Slave** tab.
8. In **PTP-Slave** tab, add the accepted devices.

9. Click **Next** to configure the **Timing** tab.



NOTE: In the **Timing** tab, the **Grand Master** box is unavailable if the **Selected Grandmaster** list box in the **Device Assignment** tab contains an unmanaged device only.

10. Click **Create**.

The PTP Timing service order for an unmanaged device is saved in the database.

11. Deploy the service order.
12. Perform a functional audit.



NOTE: For a service with an unmanaged grand master, the function audit fails if the grandmaster clock and the corresponding slave clocks are not synchronized.

**Related
Documentation**

- [Unmanaged Grandmaster Devices Overview on page 5](#)
- [Deploying a Timing Service Order on page 60](#)
- [Performing a Functional Audit for Timing Domain and Services on page 74](#)

PART 3

Administration

- [Monitoring Definitions for Timing Devices on page 53](#)
- [Monitoring Services and Service Orders for Timing Devices on page 57](#)

CHAPTER 5

Monitoring Definitions for Timing Devices

- [Managing Timing Definitions on page 53](#)
- [Publishing a Timing Definition on page 54](#)
- [Unpublishing a Timing Definition on page 54](#)
- [Deleting a Timing Definition on page 55](#)

Managing Timing Definitions

The **Manage Timing Definitions** inventory page displays the definitions you created to configure PTP and Synchronous Ethernet services. The timing definitions are sorted by name.

Viewing Timing Definitions—The **Manage Timing Definitions** inventory page provides information in a table. The table presents information in columns that include definition name, description, state, and creation date.

You can use the search text box to filter the timing definitions by name or by tag names that you create. When you start to type a name in the search box, it automatically completes the name.

Viewing timing Definition Details—Double-click a timing definition to view more detailed information. The **Definition Details** window appears.

The **Manage Timing Definitions** inventory page includes the following actions:

- **Publish a Timing Definition**—See [“Publishing a Timing Definition” on page 54](#)
- **Unpublish a Timing Definition**—See [“Unpublishing a Timing Definition” on page 54](#)
- **Delete a Timing Definition**—See [“Deleting a Timing Definition” on page 55](#)
- **Tag It**—See *Tagging an Object*
- **View Tags**—See *Managing Tags*
- **Untag It**—See *Untagging Objects*

Related Documentation

- [Creating a PTP Service Definition on page 17](#)
- [Creating a Synchronous Ethernet Definition on page 27](#)

Publishing a Timing Definition

To publish a timing definition:

1. In the Sync Design task pane, select **Manage Timing Definition**.
The **Manage Timing Definition** inventory page appears.
2. Select the timing definition that you want to publish.
3. Right-click the timing definition and select **Publish Service Definition**.

You can also open the **Actions** menu and select **Publish Service Definition**.

The **Publish Service Definition** dialog box appears.

1. Select the timing definition.
2. Click **Publish**.

The state of the timing definition changes from unpublished to published.

You see the timing definition state indicator change on the **Manage Timing Definitions** inventory page.

Related Documentation

- [Managing Timing Definitions on page 53](#)
- [Unpublishing a Timing Definition on page 54](#)
- [Deleting a Timing Definition on page 55](#)

Unpublishing a Timing Definition

Unpublishing places a timing definition in a state so that you can review or modify it to create a timing service order.

You can view the service order state in the **Manage Timing Definitions** inventory page in both thumbnail and tabular views.

To unpublish a timing definition:

1. In the Sync Design task pane, select **Manage Timing Definition**.
The **Manage Timing Definition** inventory page appears.
2. Select the timing definition that you want to unpublish.
3. Right-click the timing definition and select **Unpublish Service Definition**.

You can also open the **Actions** menu and select **Unpublish Service Definition**.

The **Unpublish Service Definition** dialog box appears.

1. Select the timing definition.
2. Click **Unpublish**.

The state of the timing definition changes from published to unpublished.

You see the timing definition state indicator change on the **Manage Timing Definitions** inventory page.

**Related
Documentation**

- [Managing Timing Definitions on page 53](#)
- [Publishing a Timing Definition on page 54](#)
- [Deleting a Timing Definition on page 55](#)

Deleting a Timing Definition

If a timing definition is being used by a timing service order, you cannot delete it.

To delete a timing definition:

1. In the Sync Design task pane, select **Manage Timing Definition**.

The **Manage Timing Definition** inventory page appears.

2. Select the timing definition you want to delete.
3. Either right-click the selected timing definition and select **Delete Service Definition**, or open the **Actions** menu and select it.

The **Delete Service Definition** dialog box appears.

4. Select the timing definition.

The **Manage Timing Definitions** page appears, displaying any remaining definitions.

5. Click **Delete**.

The timing definition is removed from the database.

**Related
Documentation**

- [Managing Timing Definitions on page 53](#)
- [Publishing a Timing Definition on page 54](#)
- [Unpublishing a Timing Definition on page 54](#)

CHAPTER 6

Monitoring Services and Service Orders for Timing Devices

- [Viewing Service Alarms in Sync Design on page 57](#)
- [Viewing Timing Service Order Details on page 59](#)
- [Deploying a Timing Service Order on page 60](#)
- [Validating a Timing Service Order on page 62](#)
- [Viewing the Configuration of a Pending Service Order on page 63](#)
- [Managing Timing Services on page 64](#)
- [Viewing Deployed Timing Services on page 64](#)
- [Decommissioning a Timing Service on page 66](#)

Viewing Service Alarms in Sync Design

Alarms warn you about conditions that can prevent the device from operating normally. When a synchronization device loses synchronization related to Precision Time Protocol, Synchronous Ethernet, or an associated synchronization failure, an alarm must be generated in the alarm viewer.

The Junos Space Network Management Platform has integrated a third-party tool, OpenNMS, to provide network monitoring capabilities. OpenNMS is installed as a part of the Junos Space Network Management Platform, which exposes some OpenNMS functionality through the **Network Monitoring** workspace. The default performance management configuration of OpenNMS for Junos Space supports generic counters, CPU, memory, temperature, and mobility counters. For information on this default configuration, see the OpenNMS documentation included in the *Junos Space Network Management Platform User Guide*.



CAUTION: Although additional OpenNMS functionality can be accessed by customizing its XML files, editing these files can affect the functionality of the **Network Monitoring** workspace. Juniper Networks does not support changes to OpenNMS.

Network providers must monitor synchronization status throughout their network in real time, because loss of synchronization can lead to degraded network performance and failed call handoffs in mobile networks, thereby affecting customer experience. Real time synchronization status is available through the management system with an option to forward the alarm as a notification through e-mail or other means to a network technician.

To access the OpenNMS tool in the **Sync Design** pane, select **Sync Design > Timing Provisioning > Manage Timing Services**.

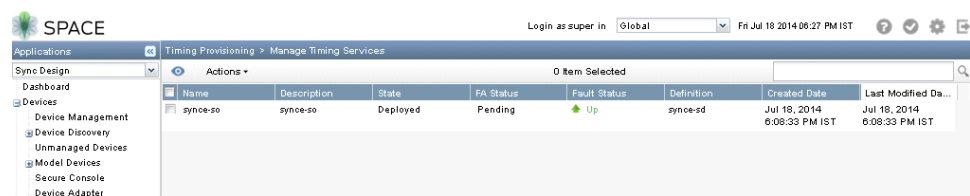
To view the service alarms:

1. Select the service that you want to modify from the displayed list of services.
2. Click **Actions** to display the available options.
3. Click **View Service Alarms**.

The **OpenNMS Network Monitoring** window appears. You can view the alarms associated with various services and search for specific alarms.

The following command in the SNMP inside the device must be committed:

Set snmp trap-group space categories timing-event



Junos Space incorporates OpenNMS to handle fault and performance management. **Fault Management**, which is implemented on the service level, enables you to identify and view devices that go down. The **Fault Status** column in the **Manage Timing Services** page is updated with **Up** (green) or **Down** (red), displaying the current fault status.

The associated faults are tracked with the alarm ID. You can view the faults in the following two ways:

- Select **Manage Services** from which you can select a service that has been impacted by the fault. Click **Actions > View Service Alarms** to view the list of alarms, as explained previously.
- Select **Network Management Platform > Network Monitoring > Alarms**. Click **View all alarms** in the **Alarm** window to display all the alarms in the network.

Network Monitoring > Alarms

View all alarms Advanced Search Long Listing Severity Legend Acknowledge entire search

Alarm Text: Time: Any

Results: (1-20 of 486) 1 2 3 4 5 Next Last

Search constraints: alarm is outstanding [-]

Legend

Ack	ID / Severity	Node	Count	Last Event Time	Description	Log Message
	12724	junos-space3 [+1 [-]	2	5/29/14 10:49:23 [<] [>]	This notification is generated when: a. One interface is associated with this VRF, and the ifOperStatus of this interface changes from up(1) to down(2). b. Multiple interfaces are associated with this VRF, and the ifOperStatus of all except one of these interfaces is equal to up(1), and the ifOperStatus of that interface changes from up(1) to down(2). c. The last interface with ifOperStatus equal to up(1) is disassociated from a VRF.	mplsL3VpnVrfDown trap received mplsL3VpnVrfConRowStatus=1 mplsL3VpnVrfOperStatus=2 mplsL3VpnVrfName=.1.3.6.1.2.1.10.166.11.1.2.2.1.6.1.83.79.49.50.56.51.57.57.54.48.53
	12723	junos-space3 [+1 [-]	1	5/29/14 10:49:23 [<] [>]	A linkDown trap signifies that the sending protocol entity recognizes a failure in one of the communication link represented in the agent's configuration. Instance: 523 IfDescr: ge-0/1/6 IfName: ge-0/1/6 IfAlias:	Agent Interface Down (linkDown Trap) on interface index:523; ifDescr: ge-0/1/6; ifName:ge-0/1/6; ifAlias:

Related Documentation

- [Managing Timing Services on page 64](#)
- [Viewing Deployed Timing Services on page 64](#)
- [Decommissioning a Timing Service on page 66](#)

Viewing Timing Service Order Details

After you have created the timing service order, you can view the details of the service order.

To view the service order details:

1. Select **Sync Design > Timing Provisioning > Manage Timing Orders**.
2. In the **Manage Timing Orders** inventory page, double-click a service order.

The PTP Service Order Details window appears.

PTP Service Order Details

PTP - General | PTP - Device | **PTP - Master** | PTP - Slave | Timing | Frequency Settings

Profile: Telecom Profile

Two step: No

Sync rate: 64 packets/sec

Announce rate: 1 packet/8 sec

Delay request rate: 64 packets/sec

Announce receipt timeout: 2

☐ Continuous ARP

Signaling Configuration

☒ Signaling

Delay rate: Min: 1 packet/sec, Max: 64 packets/sec

Announce rate: Min: 1 packet/sec, Max: 1 packet/8 sec

Sync rate: Min: 1 packet/sec, Max: 64 packets/sec

Configuration per master

Device Name	Priority 1	Priority 2	Interface(s)	Stateful Interfac...	Type
junos-space3	128	128	ge-0/1/0.0	N/A	Boundary Clock(Master)
access-hcl-bgm	128	128	eth0	N/A	Grand Master

OK

You can view the details of both the PTP service order and the Synchronous Ethernet service order.

If you have configured an unmanaged device in the PTP service order, you can view the details in the PTP-Device tab.

If you have configured an unmanaged grand master device only, the PTP-Master tab is disabled. In this scenario, the PTP-Timing tab hides the unmanaged grand master's configuration.

You can now distinguish a device in the PTP-Master and PTP-Slave tabs. A new column **Type** is added in the **Configuration per master** to identify if a device is of type *Boundary Clock (Master)*, *Grand Master*, or *Hybrid*.



NOTE: In PTP-Slave tab, the **Type** column appears only if you selected the **Enable Hybrid** check box while creating a PTP service definition.

Related Documentation

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Deploying a Timing Service Order on page 60](#)
- [Validating a Timing Service Order on page 62](#)

Deploying a Timing Service Order

This procedure schedules a service for deployment on the network. Use this procedure to perform the following tasks:

- Deploy a new service.
- Deploy a modified service.
- Redeploy a service order that failed deployment.

You cannot deploy an invalid service order.

To schedule a service for deployment:

1. In the Sync Design task pane, select **Timing Provisioning**.
2. In the **Service Orders States** pie chart, click the **Requested** segment.

The **Manage Service Orders** page shows only those service orders in the Requested state.

3. Select the service order you want to deploy.
4. Open the **Actions** menu and click **Deploy Service Order**.

The **Deploy Service** window appears.

5. Schedule the service deployment.
 - To deploy the service immediately, select **Deploy now**, and click **OK**.
 - To deploy the service at a later time, select **Deploy later**, and select a date and time for deployment, then click **OK**.



NOTE: When specifying a time to validate the service, the time field specifies the time kept by the server, but in the time zone of the client.

6. Use the Jobs workspace to monitor the outcome of the deployment. See *Viewing Jobs* in the *Junos Space Network Application Platform User Guide* for details about the Jobs workspace.

Related Documentation

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Validating a Timing Service Order on page 62](#)
- [Viewing Timing Service Order Details on page 59](#)

Validating a Timing Service Order

This procedure validates a service order but does not push the configuration to the device. Use this procedure to perform the following tasks:

- Validate a service request in the REQUESTED state.
- Validate a service request in the INVALID state after making necessary configuration changes on one or more PE devices associated with the service order.

To schedule a service order for validation, follow these steps:

1. In the Sync Design task pane, select **Timing Provisioning**.
2. In the **Service Orders States** pie chart, click the **Requested** or **Failed Deployment** segment.

The **Manage Service Orders** page shows only those service orders in the Requested state.

3. Select the service order you want to validate.
4. Open the **Actions** menu and click **Validate Service Order**.

The **Schedule Service Request Validation** window appears.

5. Validate a service now or at some future time:
 - To validate the service immediately, select **Validate now**, and click **OK**.
 - To validate the service at a later time, select **Validate later**, select a date and time for deployment, and then click **OK**.



NOTE: When specifying a time to validate the service, the time field specifies the time kept by the server, but in the time zone of the client.

After scheduling the service order for validation, the provisioning software begins validating the service order.

6. Click the Job ID in the **Job Details** window to view details about the service validation.
7. Use the Jobs workspace to monitor the outcome of the validation. See *Viewing Jobs* in the *Junos Space Network Application Platform User Guide* for details about the Jobs workspace.

Related Documentation

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Deploying a Timing Service Order on page 60](#)
- [Viewing Timing Service Order Details on page 59](#)

Viewing the Configuration of a Pending Service Order

You can view the configuration of a service order that is in the requested state, the scheduled state, the invalid state, or the failed deployment state.

To view the configuration of such service orders:

1. In the Network Activate, select **Service Provisioning > Manage Service Orders**. A list of service orders is displayed.
2. Select a service order that is in either of the following states:
 - Requested
 - Invalid
 - Scheduled
 - Failed deployment



NOTE: The Order State column displays the state of the service order.

3. Right-click the service order and select the **View Pending Order Configuration**. The Pending Order Configuration window is displayed. The configuration is displayed in xml format.



NOTE: The View Pending Order Configuration appears to be dimmed if the service order state is Completed.

4. Select a device to view the configuration details. You can also view the template configuration if a template is attached to the service order.

Based on the application's settings, the configuration is displayed in xml format or in set format. To view the configuration in set format:

1. Select **Platform > Administration > Manage Applications > Network Activate**.
2. Right-click the Network Activate application and select **Modify Application Settings**. The Modify Network Activate Settings window is displayed.
3. Select the **show configuration in set format** check box.

Related Documentation

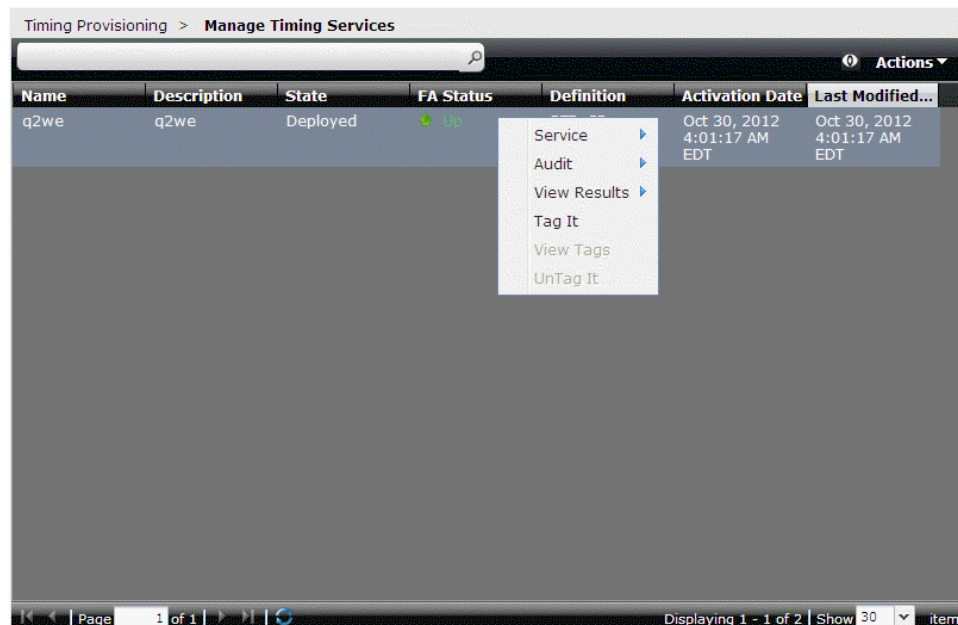
- [Viewing Timing Service Order Details on page 59](#)
- [Deploying a Timing Service Order on page 60](#)
- [Validating a Timing Service Order on page 62](#)

Managing Timing Services

After you have created the service order, you can perform standard Junos Space functions to manage the service.

In the **Sync Design** task pane, select **Timing Provisioning > Manage Timing Services**

To see the functions available, right click on the service you want to manage.



Related Documentation

- [Performing a Configuration Audit for Timing Domain and Devices on page 71](#)
- [Viewing Configuration Audit Results for Timing Domain and Services on page 73](#)
- [Performing a Functional Audit for Timing Domain and Services on page 74](#)
- [Displaying Functional Audit for Timing Domain and Services on page 78](#)

Viewing Deployed Timing Services

After you have created and deployed timing service orders, you can display the services available for management.

To view deployed timing services:

1. In the Sync Design task pane, select **Timing Provisioning > Manage Timing Services**.

The **Manage Timing Services** inventory page displays the following timing service information:

Column	Description
Name	Name of the timing service.
Description	Description of the timing service.
State	State of the service. <ul style="list-style-type: none">• Validated• Deployed
FA Status	Functional Audit status of the timing service: <ul style="list-style-type: none">• Up—Service passed functional audit• Down—Service failed functional audit• Pending—Service is deployed but a functional audit has not yet been performed, or the service has been modified since the last functional audit was performed.
Definition	Name of the definition attached to the timing service.
Activation Date	Activation date of the timing service.
Last Modified Date	Most recent date when the timing service was modified.

You can select and right-click any service and perform any of the functions available in the **Actions** menu.

2. Select and double-click a service. The service details window appears

PTP Service Details

PTP - General | PTP - Device | **PTP - Master** | PTP - Slave | Timing | Frequency Settings

Profile: Telecom Profile

Two step: No

Sync rate: 64 packets/sec

Announce rate: 1 packet/8 sec

Delay request rate: 64 packets/sec

Announce receipt timeout: 2

☐ Continuous ARP

Signaling Configuration

☒ Signaling

Delay rate: Min: 1 packet/sec
Max: 64 packets/sec

Announce rate: Min: 1 packet/sec
Max: 1 packet/8 sec

Sync rate: Min: 1 packet/sec
Max: 64 packets/sec

Configuration per master

Device Name	Priority 1	Priority 2	Interface(s)	Stateful Interface(s)	Type
junos-space3	128	128	ge-0/1/0.0	N/A	Boundary Clock(Master)
access-hcl-bgm	128	128	eth0	N/A	Grand Master

OK

You can view the details of both the PTP service order and the Synchronous Ethernet service.

You can now distinguish a device in the PTP-Master and PTP-Slave tabs. A new column **Type** is added in the **Configuration per master** to identify if a device is of type *Boundary Clock (Master)*, *Grand Master*, or *Hybrid*.



NOTE: In PTP-Slave tab, the **Type** column appears only if you selected the **Enable Hybrid** check box while creating a PTP service definition.

Related Documentation

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Managing Timing Services on page 64](#)
- [Decommissioning a Timing Service on page 66](#)

Decommissioning a Timing Service

You can decommission a service that a customer no longer needs.

To decommission a service:

1. Select the service you want to decommission.
2. Right-click the service and select **Decommission Service** from the pop-up service.

3. Do one of the following:

- To decommission the service immediately, select **Decommission now**, and click **OK**.
- To decommission the service at a later time, select **Decommission later** select a date and time to perform the operation, then click **OK**.

In the **Order Information** window, click the job ID of the decommission job.

**Related
Documentation**

- [Creating a PTP Timing Service Order on page 31](#)
- [Creating a Synchronous Ethernet Timing Service Order on page 44](#)
- [Managing Timing Services on page 64](#)
- [Viewing Deployed Timing Services on page 64](#)

PART 4

Troubleshooting

- [Troubleshooting Timing Devices on page 71](#)

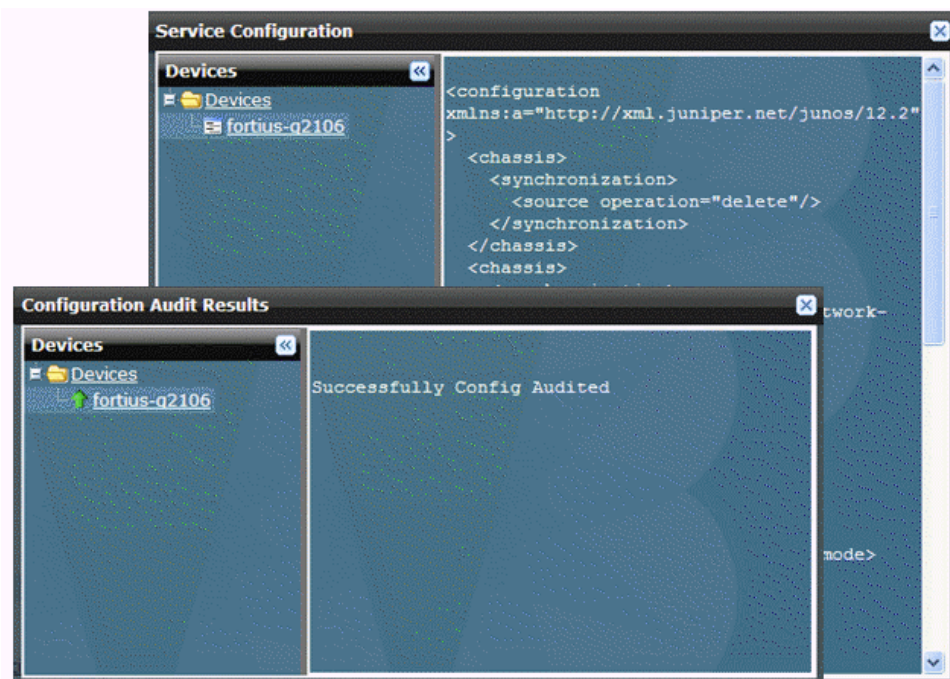
CHAPTER 7

Troubleshooting Timing Devices

- Performing a Configuration Audit for Timing Domain and Devices on page 71
- Viewing Configuration Audit Results for Timing Domain and Services on page 73
- Performing a Functional Audit for Timing Domain and Services on page 74
- Displaying Functional Audit for Timing Domain and Services on page 78

Performing a Configuration Audit for Timing Domain and Devices

A configuration audit can help you determine whether the service configuration on the device has been changed out of band. To this end, you can compare the results of a configuration audit with the service configuration in the Junos Space database. The following example shows a sample comparison.



To perform a configuration audit:

1. In the Sync Design task pane, select **Service Provisioning > Manage Services**.
2. In the **Manage Services** inventory page, select the service you want to investigate.
3. Open the **Actions** menu and select **Perform Configuration Audit**.
4. In the **Schedule Configuration Audit** window, either:
 - Select **Audit Now**, then click **OK**.
 - Select **Audit Later**, enter a date and time, then click **OK**.

An **Audit Information** window appears, providing a link to details about the audit in the Jobs workspace, and an **OK** button.

5. To monitor the progress of an audit after selecting **Audit Now**, click the Job ID in the **Audit Information** window. The **Job Management** page shows information about the functional audit job.

The **State** field indicates whether the service passed or failed the audit. If the service failed the audit, then the **Summary** field provides information about the failure.

To monitor the progress of an audit after selecting **Audit Later**, after the scheduled time of the audit:

- a. In the task pane, select **Jobs**.
 - b. In the **Job Types** window, select the **Configuration Audit** segment of the pie chart.
 - c. Select the configuration audit of interest from the inventory list.

Summary information about the audit appears in the quick look panel.
 - d. In the filter bar, select the table view icon to see additional information about the job. If the service failed the audit, information about the failure appears in the **Summary** field.
6. In the **Audit Information** window, click the job ID of the configuration audit.

The **Job Management** window appears and shows a filtered view of the job inventory, showing only the configuration audit job.



NOTE: If a resynchronization between a device and the Junos Space database is ongoing when the configuration audit job starts, the configuration audit job suspends until the resynchronization job finishes. If the resynchronization job fails to complete, the audit could be suspended indefinitely. To allow the audit to proceed, go to the Jobs workspace and cancel the resynchronization job, as described in *Canceling a Job*.

7. In the **State** column, check the status of the audit to determine whether it succeeded or failed.

Check the **Summary** column, which contains useful service information. For some failed deployments, this column also contains information about why the deployment failed.

For details about using the Job manager, see *Viewing Jobs* in the *Junos Space Network Application Platform User Guide*.

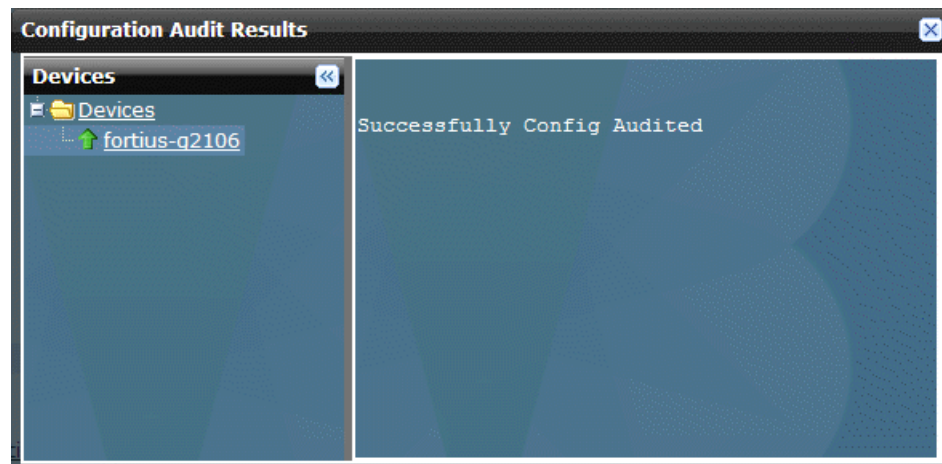
Related Documentation

- [Viewing Configuration Audit Results for Timing Domain and Services on page 73](#)
- [Performing a Functional Audit for Timing Domain and Services on page 74](#)
- [Displaying Functional Audit for Timing Domain and Services on page 78](#)

Viewing Configuration Audit Results for Timing Domain and Services

After performing a configuration audit, check the detailed results of the audit:

- In the Sync Design task pane, select **Timing Provisioning** > **Manage Timing Services**.
 - In the **Manage Timing Services** inventory view, select the service you are investigating.
 - Either open the **Actions** menu and select **View Configuration Audit Results**, or select that command from the right mouse-click menu.



Examine the audit results for missing configuration information, and keep the window open for later comparison with the service configuration in the Junos Space database.

You can validate policies for the hub and spoke (1 interface).

- To view the service configuration in the Junos Space database, double click the service icon in the **Manage Services** inventory page, then in the **Actions** menu, select **View Service Configuration**.

A new window opens and shows the service configuration.



3. Compare the contents of the Service Configuration with those of the **Configuration Audit Results** window for each device in turn. If you see discrepancies, then it is likely that the service configuration was modified out-of-band. If so, you might need to synchronize the device with the Junos Space database.

For step-by-step instructions about synchronizing devices, see *Resynchronizing Managed Devices with the Network* for details.

Related Documentation

- [Performing a Configuration Audit for Timing Domain and Devices on page 71](#)
- [Performing a Functional Audit for Timing Domain and Services on page 74](#)
- [Displaying Functional Audit for Timing Domain and Services on page 78](#)

Performing a Functional Audit for Timing Domain and Services

The functional audit is used to determine whether the configuration has taken effect on the device after a service order is deployed.

To perform a functional audit of a service to find out whether the service is up or down:

1. In the Sync Design task pane, select **Timing Provisioning > Manage Timing Services**.
2. On the **Manage Timing Services** inventory page, select the service you want to investigate.

3. Either open the **Actions** menu and select **Audit>Perform Functional Audit**, or right-click and select **Audit>Perform Functional Audit**.
4. In the **Schedule Functional Audit** window, either select **Audit now**, or select **Audit later** and select a date and time.
5. Click **OK**.
6. In the **Job Details** window, click the job ID of the functional audit.

The **Job Management** window appears and shows a filtered view of the job inventory, showing only the functional audit job.

7. In the **FA State** column, check the status of the audit.

An up arrow indicates that the audit passed. A down arrow indicates that the audit failed. If the **FA State** field indicates a failed functional audit, the device is down.



NOTE: For a service with unmanaged grand master, the function audit fails if the grandmaster clock and the corresponding slave clocks are not synchronized.

8. If the **State** field indicates the device is up, perform a configuration audit. See [“Performing a Configuration Audit for Timing Domain and Devices” on page 71](#).
9. If the **State** field indicates the device is down, the **Summary** column gives an overview of the problem.
10. For detailed results of the functional audit, see [“Displaying Functional Audit for Timing Domain and Services” on page 78](#).

A functional audit works by running commands that perform verification and reporting relevant information.

The **show frequency** command is sent to the timing device to display the runtime timing state. When the device is in a LOCKED state, the timing service is UP. All other states indicate the timing is not fully functional. The sample command and its output are shown here:

show frequency

Current Sync Source	: GPS
Input Quality	: 0
State	: LOCKED
Oscillator Type	: OCXO(Stratum3e)
Output stratum	1

The following table shows the possible attribute values to indicate the runtime timing state of the device:

Attribute Value	Functional Audit Result
LOCKED	Pass
HOLDOVER	Fail
ACQUIRING	Fail
FREERUN	Fail



NOTE: The `show frequency` command is applicable to TCA Series Timing Appliances only.

The `show chassis synchronization extensive interfaces interfaceName` command is sent to the Synchronous Ethernet device to display the runtime timing state. The sample command and its output are shown here:

```
regress@junos-space5> show chassis synchronization extensive interface ge-0/2/0
```

Current clock status	: Locked
Clock locked to	: Secondary
Interface	: ge-0/2/0
Status	: Secondary Index :152
Clock source state	:Clk qualified Priority :1
Configured QL	:PRC
ESMC QL	: DNU
Clock source type	:ifd
Kernel flags	:Up,sec



NOTE: To display information of all configured input sources, interfaces, and overall status of clock on the device, execute the `show chassis synchronization extensive interfaces` command.

The following table shows the possible attribute values to indicate the runtime timing state of the device:

Attribute Value	Functional Audit Result
LOCKED	Pass
FAILED	Fail
N/A	Fail



NOTE: The `show chassis synchronization extensive interfaces interfaceName` command is applicable only to ACX Series Universal Access Routers and MX Series 3D Universal Edge Routers.

The `run show ptp master interfaceName details` command lists the details of the PTP source (master) interface. The sample command and its output are shown here:

```
regress@junos-space2> show ptp master interface ge-0/1/2.0 detail
```

PTP Master Interface Details:

Interface	ge-0/1/2.0
Status	Master, Active
Clock Info:	
Local Address	84:18:88:c0:6f:1e
Status	Configured, Master, Active
Remote Address	01:1b:19:00:00:00



NOTE: The `run show ptp master interfaceName details` command is applicable only to ACX Series Universal Access Routers and MX Series 3D Universal Edge Routers.

Related Documentation

- [Performing a Configuration Audit for Timing Domain and Devices on page 71](#)
- [Viewing Configuration Audit Results for Timing Domain and Services on page 73](#)
- [Displaying Functional Audit for Timing Domain and Services on page 78](#)

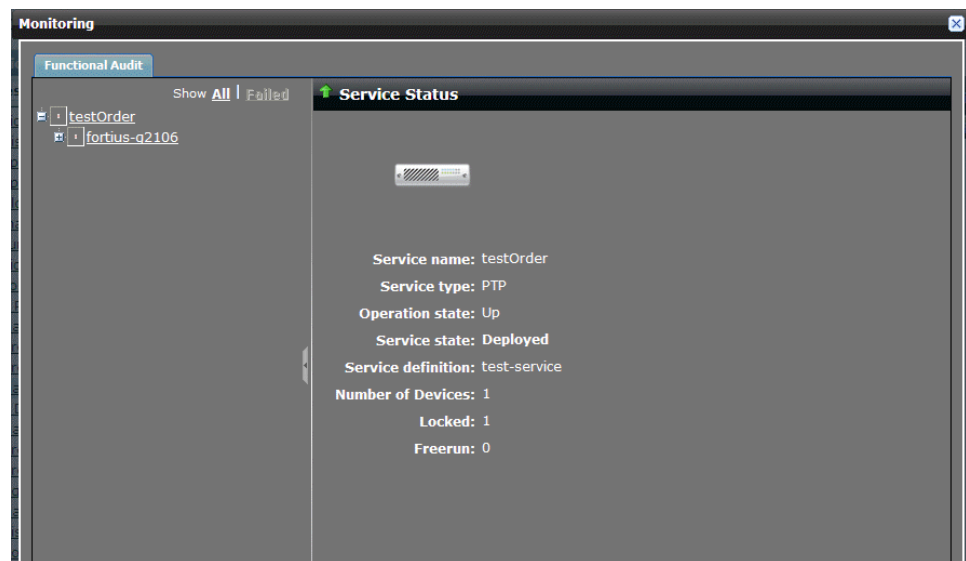
Displaying Functional Audit for Timing Domain and Services

To view the results of a functional audit of a service, follow this procedure:

After performing a functional audit on a service, look at the functional audit results:

1. In the Sync Design task pane, select **Timing Provisioning > Manage Timing Services**.
2. In the **Manage Services** page, select the service for which you want to view the functional audit results.
3. Either open the **Actions** menu and select **Functional Audit Results**, or select the same command from the right mouse-click menu.

The **Functional Audit Results** window appears, displaying Service Status in the right panel.



A green up-arrow in the **Service Status** header bar indicates that the service has passed the functional audit. A red down-arrow indicates that the service failed.

Depending on the type of service, the left panel lists the devices.

4. To show all devices in the service, in the left panel header, select **All**. To display only the device indicating failed validation, select **Failed**. Failed is dimmed if the functional audit returned no validation errors.
5. To view details for an individual device, select it in the left panel. The header bar on the right panel changes to **End Point Status**, and details for the selected item are displayed below.

Related Documentation

- [Performing a Configuration Audit for Timing Domain and Devices on page 71](#)
- [Viewing Configuration Audit Results for Timing Domain and Services on page 73](#)
- [Performing a Functional Audit for Timing Domain and Services on page 74](#)