



Precision Time Protocol, Release 12.1.3

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New and Changed Information

The following table provides an overview of the significant changes up to this current release. The table does not provide an exhaustive list of all changes nor of the new features up to this release.

Release Version	Feature	Description
NDFC release 12.1.3	Reorganized content	Content within this document was originally provided in the <i>Cisco NDFC-Fabric Controller Configuration Guide</i> or the <i>Cisco NDFC-SAN Controller Configuration Guide</i> . Beginning with release 12.1.3, this content is now provided solely in this document and is no longer provided in those documents.

Precision Time Protocol for Data Center VXLAN EVPN Fabrics

In the fabric settings for the **Data Center VXLAN EVPN** template, select the **Enable Precision Time Protocol (PTP)** check box to enable PTP across a fabric. When you select this check box, PTP is enabled globally and on core-facing interfaces. Additionally, the **PTP Loopback Id** and **PTP Domain Id** fields are editable.

The PTP feature works only when all the devices in a fabric are cloud-scale devices. Warnings are displayed if there are non-cloud scale devices in the fabric, and PTP is not enabled. Examples of the cloud-scale devices are Cisco Nexus 93180YC-EX, Cisco Nexus 93180YC-FX, Cisco Nexus 93240YC-FX2, and Cisco Nexus 93360YC-FX2 switches.

For more information, see the *Configuring PTP* chapter in *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide* and *Cisco Nexus Dashboard Insights User Guide*.

For Nexus Dashboard Fabric Controller deployments, specifically in a VXLAN EVPN based fabric deployments, you have to enable PTP globally, and also enable PTP on core-facing interfaces. The interfaces could be configured to the external PTP server like a VM or Linux-based machine. Therefore, the interface should be edited to have a connection with the grandmaster clock.

It is recommended that the grandmaster clock should be configured outside of Easy Fabric and it is IP reachable. The interfaces toward the grandmaster clock need to be enabled with PTP via the interface freeform config.

All core-facing interfaces are auto-enabled with the PTP configuration after you click **Deploy Config**. This action ensures that all devices are PTP synced to the grandmaster clock. Additionally, for any interfaces that are not core-facing, such as interfaces on the border devices and leafs that are connected to hosts, firewalls, service-nodes, or other routers, the ttag related CLI must be added. The ttag is added for all traffic entering the VXLAN EVPN fabric and the ttag must be stripped when traffic is exiting this fabric.

Here is the sample PTP configuration:

```
feature ptp

ptp source 100.100.100.10 -> _IP address of the loopback interface (loopback0) that is
already created or user created loopback interface in the fabric settings_

ptp domain 1 -> _PTP domain ID specified in fabric settings_

interface Ethernet1/59 -> _Core facing interface_
  ptp

interface Ethernet1/50 -> _Host facing interface_
  ttag
  ttag-strip
```

The following guidelines are applicable for PTP:

- The PTP feature can be enabled in a fabric when all the switches in the fabric have Cisco NX-OS Release 7.0(3)I7(1) or a higher version. Otherwise, the following error message is displayed:

PTP feature can be enabled in the fabric, when all the switches have NX-OS Release 7.0(3)I7(1) or higher version. Please upgrade switches to NX-OS Release 7.0(3)I7(1) or higher version to enable PTP in this fabric.

- For hardware telemetry support in NIR, the PTP configuration is a prerequisite.
- If you are adding a non-cloud scale device to an existing fabric which contains PTP configuration, the following warning is displayed:

TTAG is enabled fabric wide, when all devices are cloud scale switches so it cannot be enabled for newly added non cloud scale device(s).

- If a fabric contains both cloud scale and non-cloud scale devices, the following warning is displayed when you try to enable PTP:

TTAG is enabled fabric wide, when all devices are cloud scale switches and is not enabled due to non cloud scale device(s).

Precision Time Protocol for External Fabrics and Classic LAN Fabrics

In the Fabric settings for the **External Fabric** or **Classic LAN** template, select the **Enable Precision Time Protocol (PTP)** check box to enable PTP across a fabric. When you select this check box, PTP is enabled globally and on core-facing interfaces. Additionally, the **PTP Loopback Id** and **PTP Domain Id** fields are editable.

The PTP feature is supported with Cisco Nexus 9000 Series cloud-scale switches, with NX-OS version 7.0(3)I7(1) or later. Warnings are displayed if there are non-cloud scale devices in the fabric, and PTP is not enabled. Examples of the cloud-scale devices are Cisco Nexus 93180YC-EX, Cisco Nexus 93180YC-FX, Cisco Nexus 93240YC-FX2, and Cisco Nexus 93360YC-FX2 switches. For more information, refer to <https://www.cisco.com/c/en/us/products/switches/nexus-9000-series-switches/index.html>.



PTP global configuration is supported with Cisco Nexus 3000 Series switches; however, PTP and ttag configurations are not supported.

For more information, see the *Configuring PTP* chapter in *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide* and *Cisco Nexus Insights for Cisco User Guide*.

For External and Classic LAN fabric deployments, you have to enable PTP globally, and also enable PTP on core-facing interfaces. The interfaces could be configured to the external PTP server like a VM or Linux-based machine. Therefore, the interface should be edited to have a connection with the grandmaster clock. For PTP and TTAG configurations to be operational on External and Classic LAN Fabrics, you must sync up of Switch Configs to Nexus Dashboard Fabric Controller using the **host_port_resync** policy. For more information, see the section "Sync up Out-of-Band Switch Interface Configurations" in [Syncing Up Out-of-Band Switch Interface Configurations](#).

It is recommended that the grandmaster clock should be configured outside of Data Center VXLAN EVPN and it is IP reachable. The interfaces toward the grandmaster clock need to be enabled with PTP via the interface freeform config.

All core-facing interfaces are auto-enabled with the PTP configuration after you click **Deploy Config**. This action ensures that all devices are PTP synced to the grandmaster clock. Additionally, for any interfaces that are not core-facing, such as interfaces on the border devices and leafs that are connected to hosts, firewalls, service-nodes, or other routers, the ttag related CLI must be added. The ttag is added for all traffic entering the VXLAN EVPN fabric and the ttag must be stripped when traffic is exiting this fabric.

Here is the sample PTP configuration:

```
feature ptp

ptp source 100.100.100.10 -> IP address of the loopback interface (loopback0)
that is already created, or user-created loopback interface in the fabric settings
```

```
ptp domain 1 -> PTP domain ID specified in fabric settings
```

```
interface Ethernet1/59 -> Core facing interface  
  ptp
```

```
interface Ethernet1/50 -> Host facing interface  
  ttag  
  ttag-strip
```

The following guidelines are applicable for PTP:

- The PTP feature can be enabled in a fabric when all the switches in the fabric have Cisco NX-OS Release 7.0(3)I7(1) or a higher version. Otherwise, the following error message is displayed:

```
PTP feature can be enabled in the fabric, when all the switches have  
NX-OS Release 7.0(3)I7(1) or higher version. Please upgrade switches to  
NX-OS Release 7.0(3)I7(1) or higher version to enable PTP in this fabric.
```

- For hardware telemetry support in NIR, the PTP configuration is a prerequisite.
- If you are adding a non-cloud scale device to an existing fabric which contains PTP configuration, the following warning is displayed:

```
TTAG is enabled fabric wide, when all devices are cloud-scale switches  
so it cannot be enabled for newly added non cloud-scale device(s).
```

- If a fabric contains both cloud-scale and non-cloud scale devices, the following warning is displayed when you try to enable PTP:

```
TTAG is enabled fabric wide when all devices are cloud-scale switches  
and is not enabled due to non cloud-scale device(s).
```

- TTAG configuration is generated for all the devices if host configuration sync up is performed on all the devices. Ttag configuration will not be generated for any newly added devices if host configuration sync up is not performed on all newly added devices.

If the configuration is not synced, the following warning is displayed:

```
TTAG on interfaces with PTP feature can only be configured for cloud-scale devices.  
It will not be enabled on any newly added switches due to the presence of non  
cloud-scale devices.
```

- PTP and TTAG configurations are deployed on host interfaces.
- PTP and TTAG Configurations are supported between switches in the same fabric (intra-fabric links). PTP is created for inter-fabric links, and ttag is created for the inter-fabric link if the

other fabric (Switch) is not managed by Nexus Dashboard Fabric Controller. Inter-fabric links do not support PTP or ttag configurations if both fabrics are managed by Nexus Dashboard Fabric Controller.

- TTAG configuration is configured by default after the breakout. After the links are discovered and connected post breakout, perform **Deploy Config** to generate the correct configuration based on the type of port (host, intra-fabric link, or inter fabric link).

PTP Configuration for IPFM Fabrics

The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a computer network. When creating an interface, if you enable the **Enable PTP** check box, PTP is enabled across the fabric and on all the intrafabric interfaces. The supported PTP profiles for IPFM fabrics are **IEEE-1588v2**, **SMPTE-2059-2**, and **AES67-2015**.

A few things to note about the per-interface PTP profile for nonfabric ethernet interfaces are as follows:

- You must enable PTP and select PTP profile on each nonfabric ethernet interface.
- PTP profile can be different from the fabric level one.
- PTP must be enabled in the fabric settings before PTP can be configured on a nonfabric ethernet interface.

If PTP is disabled from the fabric settings, the PTP config will be removed from all the interfaces, that is, both the fabric and nonfabric interfaces.

For more information about PTP monitoring for IPFM fabrics, see the section "PTP (Monitoring)" in [Add Switches for LAN Operational Mode](#).

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