



# Configuring EEE

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This chapter describes how to configure Energy Efficient Ethernet (EEE) on Cisco NX-OS devices.

- [Finding Feature Information, on page 1](#)
- [Information About EEE, on page 1](#)
- [Virtualization Support, on page 2](#)
- [Prerequisites for EEE, on page 2](#)
- [Guidelines and Limitations, on page 2](#)
- [Default Settings, on page 2](#)
- [Configuring EEE, on page 3](#)
- [Verifying the EEE Configuration, on page 4](#)
- [Configuration Examples for EEE, on page 5](#)
- [Related Documents, on page 5](#)
- [Feature History for EEE, on page 6](#)

## Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at <https://tools.cisco.com/bugsearch> and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the “New and Changed Information” chapter or the Feature History table.

## Information About EEE

### EEE

Energy Efficient Ethernet (EEE) is an IEEE 802.3az standard that is designed to reduce power consumption in Ethernet networks during idle periods. EEE can be enabled on devices that support low power idle (LPI) mode. Such devices can save power by entering LPI mode during periods of low utilization. In LPI mode, systems on both ends of the link can save power by shutting down certain services. EEE provides the protocol needed to transition into and out of LPI mode in a way that is transparent to upper layer protocols and applications.

## EEE LPI Sleep Threshold

The EEE LPI sleep threshold specifies how long an interface should wait to go to sleep after detecting an idle state. You can configure the threshold to be aggressive or nonaggressive.

## EEE Latency

The EEE latency specifies the EEE delay that is added to your traffic. The default value is a constant latency of 6 microseconds.

## Virtualization Support

By default, Cisco NX-OS places you in the default virtual device context (VDC) unless you specifically configure another VDC. For more information about VDCs, see the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide*.

## Prerequisites for EEE

EEE has the following prerequisites:

- To configure VDCs, you must install the appropriate license. See the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide* for configuration information and the *Cisco NX-OS Licensing Guide* for licensing information.

## Guidelines and Limitations

Guidelines and Limitations:

- Only F2e (enhanced) copper port modules support EEE. F2e fiber port modules do not support EEE
- EEE is supported only for 10-Gigabit link speeds. It is not supported for 1-Gigabit link speeds.
- Changing the EEE configuration resets the interface because the device has to restart Layer 1 autonegotiation.
- You might want to enable the Link Layer Discovery Protocol (LLDP) for devices that require longer wakeup times before they are able to accept data on their receive paths. Doing so enables the device to negotiate for extended system wakeup times from the transmitting link partner.

## Default Settings

Lists the default settings for EEE parameters.

**Table 1: Default EEE Parameters**

Parameters	Default
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EEE	Disabled
EEE LPI sleep threshold	Nonaggressive
EEE latency	6 microseconds

## Configuring EEE

This section includes the following topics:

- Enabling or Disabling EEE
- Configuring the EEE LPI Sleep Threshold

### Enabling or Disabling EEE

You can enable or disable EEE on an interface that is connected to an EEE-capable link partner.

#### Before you begin

Make sure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Places you in global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface ethernet slot/port</b>	Enters global configuration mode.
<b>Step 3</b>	switch(config-if)# <b>[no] power efficient-ethernet auto</b>	Enables or disables EEE on the specified interface. When EEE is enabled, the device advertises and auto negotiates EEE to its link partner.
<b>Step 4</b>	(Optional) switch(config-if)# <b>show interface ethernet slot/port</b>	Displays the EEE status on the interface.
<b>Step 5</b>	(Optional) switch(config)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Configuring the EEE LPI Sleep Threshold

You can configure the EEE LPI sleep threshold on an interface to specify how aggressively you want it to go to sleep

#### Before you begin

Make sure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	switch# <b>configure terminal</b>	Places you in global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface ethernet slot/port</b>	Enters global configuration mode.
<b>Step 3</b>	switch(config-if)# <b>[no] power efficient-ethernet sleep threshold aggressive</b>	Configures the EEE LPI sleep threshold on the interface to be aggressive or nonaggressive. The no form of this command enables the nonaggressive threshold. <ul style="list-style-type: none"> <li>• Aggressive—Causes the device to enter LPI mode after 20 microseconds of detecting an idle state.</li> <li>• Nonaggressive—Causes the device to enter LPI mode after 600 microseconds of detecting an idle state.</li> </ul>
<b>Step 4</b>	(Optional) switch(config)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

## Verifying the EEE Configuration

To display the EEE configuration, perform one of the following tasks:

**Table 2: EEE on an Ethernet interface**

<b>Command</b>	<b>Purpose</b>
<b>show environment power detail</b>	Displays the current power usage.
<b>show interface ethernet slot/port</b>	Displays the EEE status on the interface. The options are as follows: <ul style="list-style-type: none"> <li>• N/A—The interface is not capable of EEE.</li> <li>• Disabled—EEE is disabled on this interface.</li> <li>• Disagreed—EEE autonegotiation with the link partner has failed</li> <li>• Operational—EEE is enabled and operational on this interface.</li> </ul>
<b>show interface ethernet slot/port capabilities</b>	Displays whether the interface is EEE capable.

<p><b>show interface ethernet <i>slot/port</i> counters detailed</b></p>	<p>Displays the following EEE statistics on the interface:</p> <ul style="list-style-type: none"> <li>• Tx LPI uses—The amount of time (in microseconds) that the transmitting link partner waits before it starts transmitting data after leaving LPI mode.</li> <li>• Rx LPI uses—The amount of time (in microseconds) that the receiving link partner requests that the transmitting link partner wait before transmitting data after leaving LPI mode.</li> <li>• Tx LPI requests—The number of times that the transmitting link partner makes a request to enter LPI mode.</li> <li>• Rx LPI indications—The number of times the receiving link partner detects that the transmitting link partner has entered LPI mode.</li> </ul>
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## Configuration Examples for EEE

### Example

This example shows how to enable EEE on an Ethernet interface:

```
switch# config t
switch(config)# interface ethernet 7/1
switch(config-if)# power efficient-ethernet auto
switch(config-if)# power efficient-ethernet sleep threshold aggressive
switch(config-if)# show interface ethernet 7/1
Ethernet7/1 is up
  EEE(efficient-ethernet): Operational
```

## Related Documents

Related Topic	Document Title
EEE CLI commands	<i>Cisco Nexus 7000 Series NX-OS System Management Command Reference</i>
VDCs	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide</i>

## Feature History for EEE

Your software release might not support all the features in this document. For the latest caveats and feature information, see the Bug Search Tool at <https://tools.cisco.com/bugsearch/> and the release notes for your software release.

*Table 3: Feature History for EEE*

Feature Name	Releases	Feature Information
EEE	6.1(2)	This feature was introduced.