# Configure and Verify Maximum Transmission Unit on Nexus Platforms

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## Introduction

This document describes how to configure and verify Maximum Transmission Unit (MTU) on Cisco Nexus switches.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

# Configure

## Layer 3 MTU Configurations

All Layer 3 ports, regardless of platform, are configured on a per-port basis.

#### Configure MTU on a Switched Virtual Interface (SVI)

<#root>

```
Nexus(config)#

interface vlan 1


Nexus(config-if)#

mtu 9216
```

---

#### Configure MTU on a Layer 3 Port

<#root>

```
Nexus(config)#

interface ethernet 1/1


Nexus(config-if)#

no switchport


Nexus(config-if)#
```

```
mtu 9216
```

---

## Layer 2 MTU Configurations

Layer 2 MTU is set either through a network Quality of Service (QoS) policy or through configuration of the port itself (on switches that support per-port MTU). Only the Nexus 7000, 9000, and certain 3000 models support per-port MTU.

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### Network QoS MTU Configuration

**Nexus 3000:** Includes Nexus 3048, 3064, 3132Q, 3132Q-X, 3132Q-XL, 3172, and 3500 Series switches

**Nexus 5000:** All Nexus 5000 and 5500 Series switches

**Nexus 6000:** All Nexus 6000 Series switches

To configure an elevated MTU on these switches, create a **network-qos** policy or modify a policy that already exists to specify the elevated MTU. This configuration applies to all ports. This includes any Cisco Fabric Extender (FEX) ports connected to the switch.

---



**Note**: Do not use a network-qos policy to configure a per-port MTU. These policies do not support per-port MTU configuration.

---

<#root>

```
policy-map type network-qos jumbo
  class type network-qos class-default
           mtu 9216
system qos
  service-policy type network-qos jumbo
```

---

### Per-Port MTU Configuration

**Nexus 3000:** Includes Nexus 3132Q-V, 3164, 31108, 31128PQ, 3200 Series, and 36180YC-R switches

**Neuxs 7000:** All Nexus 7000- and 7700 Series switches

**Nexus 9000:** All Nexus 9200 Series switches (includes 92xxx), 9300 Series switches (includes 93xxx), and 9500 Series switches

---



**Note**: Platforms that use Per-Port MTU Configuration L2 ports can only use the System Jumbo MTU configuration on the switch or 1500.

---

By default, the System Jumbo MTU is 9216 and L2 ports configured with Jumbo MTU automatically updates to the new value if changed.

<#root>

Nexus#

**show running-config all | i jumbomtu**

**system jumbomtu 9216**

Nexus(config)#

**system jumbomtu ?**

**<1500-9216> Enter jumbomtu**

---

To configure an MTU on a per-port basis, this configuration is needed:

<#root>

Nexus(config)#

**interface ethernet 1/1**

Nexus(config-if)#

**mtu 9216**

---

If an invalid value is entered, an error is returned:

```
<#root>

Nexus(config-if)#

 mtu 9000
ERROR: MTU can only be default or system jumbo MTU
```

## Nexus 2000 Configuration

**Note:** The Nexus 2000 MTU is set with the configuration of jumbo frames on the parent switch. For parent switches that allow jumbo on a per-port basis, configure the FEX Fabric Port-channel (FPC). If the parent switch requires a **network-qos** policy, the jumbo is set with the QoS policy configuration of the parent switch. These changes are automatically pushed down to the FEX in both cases.

### Per-Port Fabric Port Channel (FPC) Configuration (to be configured on the Parent Nexus Switch)

```
<#root>

interface port-channel136
  switchport mode fex-fabric
  fex associate 136
  vpc 136


mtu 9216
```

**Note**: The Nexus 7000 does not allow you to set FEX MTU with the FPC in Version 6.2 and later. You must instead create a custom QoS policy as the next configuration details.

### Nexus 7000 / FEX Jumbo Frame Configuration (only applies to version 6.2 and later)

**Note**: Modify the template currently in use. In order to find the current template in use, run the **show policy-map system type network-qos** command.

```
<#root>

7K(conf)#
```

```
class-map type network-qos match-any c-nq-8e-custom

7K(config-cmap-nqos)#
match cos 0-7


7K(config)#
policy-map type network-qos nq-8e-custom template 8e

7K(config-pmap-nqos)#
class type network-qos c-nq-8e-custom

7K(config-pmap-nqos-c)#
congestion-control tail-drop

7K(config-pmap-nqos-c)#
mtu 9216


7K(config)#
system qos

7K(config-sys-qos)#
service-policy type network-qos nq-8e-custom
```

---

### Network QoS Policy Configuration (to be configured on the Parent Nexus Switch)

<#root>

```
policy-map type network-qos jumbo
  class type network-qos class-default
    mtu 9216
system qos
  service-policy type network-qos jumbo
```

# Verify

Use this section to confirm your configuration is setup properly.

The Cisco CLI Analyzer (registered customers only) supports certain **show** commands. Use the Cisco CLI Analyzer to view an analysis of **show** command outputs.

## Layer 3 MTU

Verify Layer 3 MTU on all Nexus platforms when running the **show interface eth x/y** command as this example shows:

```
<#root>

Nexus#

show interface ethernet 1/19


Ethernet1/19 is up
Dedicated Interface
Hardware: 100/1000/10000 Ethernet, address: 547f.ee5d.413c (bia 547f.ee5d.40fa)

MTU 9216 bytes

, BW 1000000 Kbit, DLY 10 usec
```

Verify SVI MTU by running the **show interface vlan X** command as this output shows:

```
<#root>

Nexus#

show interface vlan 1


Vlan1 is down (Non-routable VDC mode), line protocol is down
  Hardware is EtherSVI, address is  547f.eed8.ec7c
  Internet Address is 192.168.10.10/24


MTU 9216 bytes
```

```
, BW 1000000 Kbit, DLY 10 usec
```

---

## Layer 2 MTU

This section describes how to verify Layer 2 MTU per platform. These commands are run from the parent switch.

### Verify the MTU on Switches That Use Network QoS

<#root>

```
Nexus#
```

**show queuing interface ethernet 1/1**

```
Ethernet1/1 queuing information:
  TX Queuing
    qos-group  sched-type  oper-bandwidth
        0       WRR            100
  RX Queuing
    qos-group 0
    q-size: 469760,
```

**HW MTU: 9216 (9216 configured)**

```
-- or --

Nexus#
```

**show queuing interface ethernet 1/1**

```
slot  1
=======
```

**HW MTU of Ethernet1/1 : 9216 bytes**

```
Egress Queuing for Ethernet1/1 [System]
```

---

### Verify the MTU on Switches that Support Per-port MTU

<#root>

```
Nexus#
```

**show interface ethernet 1/12**

```
Ethernet1/12 is up
admin state is up, Dedicated Interface
  Hardware: 1000/10000 Ethernet, address: 7c0e.ceca.f183 (bia 7c0e.ceca.f183)
```

**MTU 9216 bytes**

```
, BW 10000000 Kbit, DLY 10 usec
```

---

## Nexus 2000

---



**Note**: When the Nexus 3000 is on code earlier than 7.0(3)I2(2a), check the MTU value by running the **show queueing interface ethernet x/x** command. Nexus 3000 switches that run 7.0(3)I2(2a) and later, show the MTU size on a per-port basis.

---

For a FEX connected to Nexus 5000, 6000, and 7000:

<#root>

```
Nexus#
```

**show queuing interface ethernet 136/1/1**

```
if_slot 68, ifidx 0x1f870000
Ethernet136/1/1 queuing information:
  Input buffer allocation:
  Qos-group: 0
  frh: 3
  drop-type: drop
  cos: 0 1 2 3 4 5 6 7
  xon       xoff      buffer-size
  ---------+---------+-----------
  19200     78080     90880

  Queueing:
  queue   qos-group    cos                priority     bandwidth
```

```
mtu


--------+------------+--------------------+---------+----------------+--------
  3                  0        0 1 2 3 4 5 6      WRR       100

   9280
```

---

For a FEX connected to Nexus 9000:

```
<#root>

9K#

show interface ethernet 104/1/1


Ethernet104/1/1 is up
admin state is up,
  Hardware: 100/1000 Ethernet, address: 5475.d0e0.e5c2 (bia 5475.d0e0.e5c2)


 MTU 9216 bytes

, BW 1000000 Kbit, DLY 10 usec
```

---

# Troubleshoot

This section provides information you can use to troubleshoot your configuration.

The Cisco CLI Analyzer (registered customers only) supports certain **show** commands. Use the Cisco CLI Analyzer to view an analysis of **show** command outputs.

---

**Note**: Refer to Important Information on Debug Commands before you run **debug** commands.

---

Sometimes it is necessary to verify the changes in software. To do this, check the Ethernet port manager (ethpm) to verify the changes were pushed through software on any platform:

```
<#root>

Switch#

show system internal ethpm info interface eth 6/5 | egrep -i mtu
```

```
medium(broadcast), snmp trap(on),

MTU(4000)
```

---

It is also possible on M1, M2, F1, and F2 modules to verify the hardware changes were pushed down:

```
<#root>

module-1#

show hardware internal mac port 20 state | i MTU


 GD: Port speed Undecided GD MTU 10240 (fixed to max),

PL MTU 9238

 mode 0
```

---

Or you can look at the QoS configuration on the linecard:

```
<#root>

module-1#

show hardware internal mac port 33 qos configuration | beg mtu

  vl  hw_mtu   pm_mtu   pm_adj  qos_mtu   qos_adj

last_mtu

   0   9238     9728      22     9216       22

9216
```

---

# Impact

A mismatched MTU across a link can have an impact on routed interfaces with routing adjacencies and causes a Type 1 inconsistency with VPC if both sides of the VPC do not match MTU (configure with caution.)

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## Known Defects

- Cisco bug ID CSCuf20035 - (Nexus 7000) FEX MTU Changes do not Take Effect on FEX Queues