



## Configuring Mixed Mode

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This chapter describes how to configure the Mixed Mode (Analytics and NetFlow) feature on Cisco NX-OS devices.

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## About Mixed Mode

You can configure NetFlow and Analytics features on a switch, so both the features coexist and utilize the standard V9 export from CPU. This mode, in which both the features coexist, is called the mixed mode.



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**Note** Until Cisco NX-OS Release 10.2(3)F, standard V9 export was supported only for NetFlow flow records. Beginning from Cisco NX-OS Release 10.2(3)F, standard V9 export was supported for Analytics also. However, NetFlow and Analytics features were mutually exclusive.

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## Guidelines and Limitations for Mixed Mode

The following guidelines and limitations are applicable to Mixed mode:

- Beginning with Cisco NX-OS Release 10.3(1)F, both NetFlow and Analytics can co-exist and use the standard V9 export from CPU resulting in decreased processing load on the collectors. However, this mixed mode is not supported on 9300-EX modules. Furthermore, transition to mixed mode is not possible to or from analytics mode. The applicable guidelines and limitations are as follows:
  - L2 flow monitor is not supported.
  - VRF filter is not supported.
  - ND ISSU is not supported.

- The IPv4 and IPv6 profiles are as follows:
  - IP flow monitor: 28
  - IPv6 flow monitor: 26
- Analytics record config must be a superset of all the record parameters.
- Configure system monitor before configuring any system filter/interface filter configs.
- Unconfigure system filter/interface filter configs, before unconfiguring system monitor.
- In mixed mode, two NetFlow records are exported for AN flow on EOR.
- Interface based FT is not supported for tunnel traffic flows such as MPLS, VXLAN, and GRE.
- Beginning with Cisco NX-OS Release 10.3(3)F, `Ingress_VRF_ID` is supported for the NetFlow and Analytics features on all Cisco Nexus 9000 switches.  
The ingress vrf-id is captured, shown in **show flow cache** and sent to NetFlow collector.  
When Layer 3 NetFlow is configured on a Layer 2 interface and the traffic is sent, and then the **show flow cache** command output displays the value of `Ingress_VRF_ID` as zero.
- Beginning with Cisco NX-OS Release 10.3(3)F, the NetFlow mixed mode is enabled by default. This reduces the TCAM space assigned to the analytics feature from a maximum of 512 entries to a maximum of 256 entries.
- Beginning with Cisco NX-OS Release 10.3(3)F, flow record is seen when it is defined in system filter, but not defined in interface filter unlike in earlier releases. In the earlier releases, if the interface filter is configured, the flow record was seen only if it was defined in the interface filter.

## Mixed Mode: Use Cases

Mixed mode can be configured only from NetFlow mode. In a scenario where the switches already have feature Analytics enabled, unconfigure analytics first, configure NetFlow feature, and then transition to mixed mode.

The following are the possible use cases for mixed mode:

- Switches already deployed with feature Analytics
- Switches already deployed with feature NetFlow
- Switches that have neither feature configured

After configuring the mixed mode, use the standard V9 format to export both NetFlow and Analytics flow records from the CPU to the respective collectors.




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**Note** Analytics data is a superset of NetFlow data. The additional analytics flow data such as flow latency, traffic burst data, payload length, TCP flags, IP flags, and packet disposition flags is communicated through Vendor Specific Fields (VSF).

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## Use Case: Switches Already Deployed with Feature Analytics

Unconfigure or Save feature Analytics configuration and perform the steps indicated in Use Case: Switches that have Neither Features Configured. Note that transition to mixed mode is not possible to or from Analytics mode.

## Use Case: Switches Already Deployed with Feature NetFlow

Perform the following procedure for switches that already have feature netflow deployed on them:

1. Use the following command to perform tcam carving for mixed mode:

**hardware flow-table analytics-netflow**




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**Note** This command disrupts the flow monitoring and record exports for a brief period.

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2. Configure feature analytics as follows:

```
feature analytics
analytics
  flow filter telemetryFP
    ipv4 telemetryIpv4Acl
    ipv6 telemetryIpv6Acl
  flow exporter e11
    destination 10.10.20.21 v9
    transport udp 1100
    events transport udp 55
    source Ethernet1/42
  flow exporter e12
    destination 10.10.20.21 v9
    transport udp 9200
    events transport udp 555
    source Ethernet1/42
  flow record fte-record
    match ip source address
    match ip destination address
    match ip protocol
    match transport source-port
    match transport destination-port
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
  flow monitor m1
    record fte-record
    exporter-bucket-id 1 0 4095
    exporter e11
  flow monitor m2
    record fte-record
    exporter-bucket-id 1 0 2000
    exporter e11
    exporter-bucket-id 2 2001 4095
    exporter e12
  flow profile telemetryProf
    collect interval 1000
    source port 1001
  flow event fte-event1
    group drop-events
    capture buffer-drops
```

```

        capture acl-drops
        capture fwd-drops
    group packet-events
        capture tos 50
        capture ttl 50
    flow system config
        exporter-id 4
        monitor ml input
        profile telemetryProf
        event fte-event1
        filter telemetryFP

```

## Use Case: Switches that have Neither Features Configured

Configure feature netflow and then perform either the steps mentioned in Use Case: Switches Already Deployed with Feature NetFlow or the following steps:

```

feature netflow
hardware flow-table analytics-netflow
feature analytics
flow exporter e1
    destination 10.10.20.21
    transport udp 100
    source Ethernet1/42
    version 9
flow record r4
    match ipv4 source address
    match ipv4 destination address
    match ip protocol
    match transport source-port
    match transport destination-port
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
flow record r6
    match ip protocol
    match transport source-port
    match transport destination-port
    match ipv6 source address
    match ipv6 destination address
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
flow monitor m41
    record r4
    exporter e1
flow monitor m6
    record r6
    exporter e1
analytics
    flow filter telemetryFP
        ipv4 telemetryIpv4Acl
        ipv6 telemetryIpv6Acl
    flow exporter e11
        destination 10.10.20.21 v9
        transport udp 1100
        events transport udp 55
        source Ethernet1/42
    flow exporter e12
        destination 10.10.20.21 v9

```

```

transport udp 9200
events transport udp 555
source Ethernet1/42
flow record fte-record
  match ip source address
  match ip destination address
  match ip protocol
  match transport source-port
  match transport destination-port
  collect counter packets
  collect timestamp sys-uptime first
  collect timestamp sys-uptime last
flow monitor m1
  record fte-record
  exporter-bucket-id 1 0 4095
  exporter e11
flow monitor m2
  record fte-record
  exporter-bucket-id 1 0 2000
  exporter e11
  exporter-bucket-id 2 2001 4095
  exporter e12
flow profile telemetryProf
  collect interval 1000
  source port 1001
flow event fte-event1
  group drop-events
    capture buffer-drops
    capture acl-drops
    capture fwd-drops
  group packet-events
    capture tos 50
    capture ttl 50
flow system config
  exporter-id 4
  monitor m1 input
  profile telemetryProf
  event fte-event1
  filter telemetryFP

interface Ethernet1/42
  ip flow monitor m41 input
  ipv6 flow monitor m6 input

```

## Verifying the Mixed Mode Configuration

To display the mixed mode configuration, perform one of the following tasks:

Command	Purpose
<b>show flow cache [ipv4   ipv6]</b>	Displays information about NetFlow IP flows.  <b>Note</b> Beginning with Cisco NX-OS Release 10.3(3)F, this command output also displays Ingress VRF ID. The ingress vrf-id is captured, shown in show flow cache and sent to NetFlow collector.

Command	Purpose
<b>show flow exporter</b> [ <i>name</i> ]	Displays information about NetFlow/Analytics flow exporters and statistics. You can enter up to 63 alphanumeric characters for the flow exporter name.
<b>show flow interface</b> [ <i>interface-type slot/port</i> ]	Displays information about NetFlow/Analytics interfaces.
<b>show flow record</b> [ <i>name</i> ]	Displays information about NetFlow/Analytics flow records. You can enter up to 63 alphanumeric characters for the flow record name.
<b>show running-config</b> [ <b>netflow</b>   <b>analytics</b> ]	Displays the coexisting NetFlow and Analytics configuration that is currently on your device.
<b>show flow monitor</b>	Displays the NetFlow/Analytics monitor configuration.
<b>show flow system</b>	Displays information about the Analytics system configuration.
<b>show flow filter</b>	Displays information about Analytics filters.
<b>show flow profile</b>	Displays information about the Analytics profile.
<b>show flow event</b>	Displays information about the Analytics events.

## Display Example for Mixed Mode

The output of the **show flow cache** command displays:



**Note** Only 10k flows are displayed in XML output.



**Note** When Layer 3 NetFlow is configured on a Layer 2 interface and the traffic is sent, and then the **show flow cache** command is run, the output displays the value of Ing-VRF as zero.

### show flow cache

```
Ingress IPv4 Entries
SIP          DIP          BD ID    S-Port  D-Port  Protocol  Byte Count  Packet Count
TCP FLAGS    TOS          if_id    flowStart  flowEnd  Profile   Ing-VRF
17.1.1.2     17.1.1.1    1671     0        0        89        480         8
0x0          0xc0        0x1a004400 2938966  2976728  5 : NF    0
17.1.1.2     224.0.0.13  1672     0        0        103       144         2
0x0          0xc0        0x1a004400 2941719  2969951  5 : NF    0
17.1.1.2     224.0.0.13  1675     0        0        103       72          1
0x0          0xc0        0x1a004400 2961417  2961667  5 : NF    0
17.1.1.2     224.0.0.5   1675     0        0        89        340         5
```

```

0x0          0xc0    0x1a004400 2943341      2979400      5 : NF      0
17.1.1.2     17.1.1.1    1671      2048        0          1      3612      43
0x0          0x0     0x1a004400 2938188      2980184      5 : NF      0
    
```

Ingress IPV6 Entries

SIP	DIP	BD ID	S-Port	D-Port	Protocol	Byte Count	Packet
Count	TCP FLAGS	Flow Label	if_id	flowStart	flowEnd	Ing-VRF	
fe80::822d:bfff:fe81:e415	ff02::5	4147	0	0	89	490	5
0x0	0x0	0x1a003400	11217548	11254367	1		

