



Configuring IPFIX

This chapter describes how to configure IPFIX on Cisco IOS XR devices.

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IP Flow Information Export (IPFIX) 315

Internet Protocol Flow Information Export (IPFIX) is an IETF standard export protocol (RFC 7011) for sending IP flow information. Cisco NCS 5500 Router supports IPFIX 315 format to export flow information. IPFIX 315 format facilitates sending 'n' octets frame information starting from ethernet header till transport header of the traffic flow over the network. IPFIX 315 supports sending variable size packet record with variable payload information such as IPv4, IPv6, MPLS, and Nested packets like OuterIP-GRE-InnerIP etc. The process includes sampling and exporting the traffic flow information. Along with the ethernet frame information, IPFIX 315 format exports information of incoming and outgoing interface of the sampled packet.

The information of the packets flowing through a device is used for variety of purpose including network monitoring, capacity planning, traffic management, etc.



Note Cisco NCS 5500 Router does not support Netflow version 9 format to export flow information.

Sampling and Exporting Information

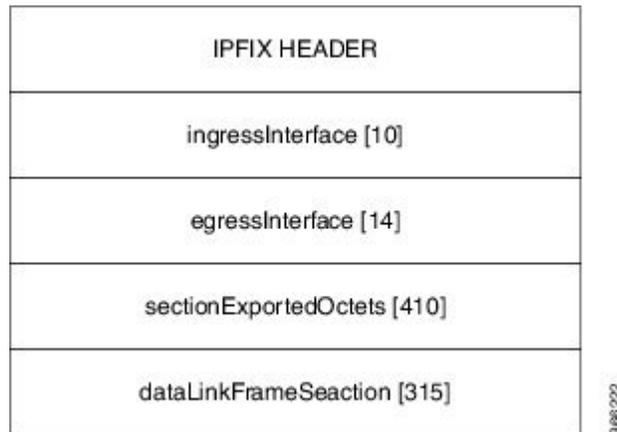
You must configure a sampling map to sample the traffic flow information. The sampler map specifies the rate at which packets (one out of n packets) are sampled. The minimum sampling rate is 1 out of 32,000 packets. Not all packets flowing through a device are exported; packets selected as per sampling rate are considered for exporting.

You must configure a sampling map to sample the traffic flow information. The sampler map specifies the rate at which packets (one out of n packets) are sampled.

The size of exported packet is until and including L4 header.

The below figure *IPFIX 315 Export Packet Format* shows exported packet information.

Figure 1: IPFIX 315 Export Packet Format



A special cache type called Immediate Aging is used while exporting the packets. Immediate Aging ensures that the flows are exported as soon as they are added to the cache. Use the command **cache immediate** in flow monitor map configuration to enable Immediate Aging cache type.

IPFIX 315 Implementation Considerations

Here are few key points to consider before implementing IPFIX 315:

- Supported only in ingress direction.
- Supported on third generation of ASR 9000 line cards.
- Supported on main interface only. The traffic on all sub-interfaces under the main interface is exported.
- Not supported on satellite interface.
- Supports only L3 routed packets.
- The outgoing interface information may not be correct incase of packets that are multicasted or broadcasted on multiple ports.
- The incoming and outgoing interface will have information of main interface and not the sub-interface even if the packet is routed via sub-interface. Incase of bundles it will point to bundle main interface.
- IPFIX 315 is not supported on BVI interface.
- Sampling and exporting of the control packets is not supported.

Configuring IPFIX 315

Configuring IPFIX 315 involves:

1. Configuring Exporter map
2. Configuring Monitor map
3. Configuring Sampler map
4. Applying the Monitor map and Sampler map to an interface

Configuring Exporter map

```

flow exporter-map ipfix_exp
  version ipfix
  !
  dscp 40
  transport udp 9002
  source Loopback1
  destination 100.10.1.112
  !

```

Configuring Monitor map

```

flow monitor-map ipfix_mon
  record datalinksectiondump
  exporter ipfix_exp
  cache immediate
  cache entries 1000000
  cache timeout rate-limit 1000000
  !

```

Configuring Sampler map

```

sampler-map ipfix_sm
  random 1 out-of 32000
  !

```



Note The default cache size is 65535, hence you can configure sampling rate as 1 out of 65535 packets. However the recommended sampling rate is 1 out of 32000 packets.

Applying the Monitor map to an interface

```

interface HundredGigE 0/0/0/18
  flow datalinkframesection monitor ipfix_mon sampler ipfix_sm ingress

```

Verification

Use the **show flow platform producer statistics location** command to display the statistics for datalinkframesection in the ingress direction:

```

RP/0/RP0/CPU0#show flow platform producer statistics location 02/CPU0
Wed Dec  6 02:49:04.411 EST
Netflow Platform Producer Counters:
IPv4 Ingress Packets:                3558922
IPv4 Egress Packets:                  183
IPv6 Ingress Packets:                  0
IPv6 Egress Packets:                  0
MPLS Ingress Packets:                 2176292132
MPLS Egress Packets:                  96276772
Section Ingress Packets             2176292157
Drops (no space):                     0
Drops (other):                         0
Unknown Ingress Packets:               0
Unknown Egress Packets:                 0
Worker waiting:                        369792
SPP Packets:                           2119944979
Flow Packets:                          2276128009
Flow Packets per SPP Frame:            1

```

Use the **show flow monitor <monitor-map> cache location** command to check the flow monitor stats. In this example flow statistics for *ipfix_mon* monitor map are displayed:

```
RP/0/RP0/CPU0#show flow monitor ipfix_mon cache location 0/2/CPU0

Cache summary for Flow Monitor ipfix:
Cache size:                               65535
Current entries:                           0
Flows added:                               2515
Flows not added:                           0
Ager Polls:                               252
- Active timeout                           0
- Inactive timeout                          0
- Immediate                               2515
- TCP FIN flag                              0
- Emergency aged                            0
- Counter wrap aged                         0
- Total                                     2515
Periodic export:
- Counter wrap                              0
- TCP FIN flag                              0
Flows exported                             2

Matching entries:                           0
```

In the above sample output, cache immediate entries are 2515 and flows exported are 2.