draft-evans-opsawg-ipfix-discard-class-ie-00

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Problem statement 1

- draft-ietf-opsawg-discardmodel defines an information model and data model that provides precise classification of packet loss
- YANG data model implementation provides device and interface-level discard statistics
- Effective automated triage often requires understanding which specific flows are impacted
  - e.g. when mitigating congestion, operators may need to identify and trace the sources of elephant flows
- This requires the ability to correlate device and interface-level discard classes with the specific flows being dropped

Problem statement 2

- RFC7270 defines the forwardingStatus Information Element for reporting packet forwarding outcomes in IPFIX
- The defined drop reason codes lack the granularity and clarity needed for automated root cause analysis and impact mitigation
    - e.g. the “For us” reason code

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- Defines a new Information Element, flowDiscardClass, to provide a consistent classification scheme for packet discards across IPFIX implementations
- Implements the information model from draft-ietf-opsawg-discardmodel
  - The component is implicitly flow and the type is implicitly discards

Design approach

- Leveraging existing IPFIX Information Elements where possible to avoid redundancy
  - Leaf nodes that represent specific discard reasons are assigned unique sequential values
  - Leaf nodes that can be represented by existing IPFIX Information Elements are not assigned reason codes to avoid redundancy
    - Direction (ingress/egress) is handled by the flowDirection Information Element (IE 61)
    - IP version is handled by the ipVersion Information Element (IE 60)
    - Unicast versus multicast classification is handled by examining the source and destination addresses (sourceIPv4Address (IE 8), destinationIPv4Address (IE 12), sourceIPv6Address (IE 27), destinationIPv6Address (IE 28))
    - QoS class information is handled by the ipDiffServCodePoint Information Element (IE 195)
  - Parent nodes in the YANG tree are assigned reason codes to enable both coarse and fine-grained reporting

Possible alternative design approach

- Implement all leaves under the flow/ discards branch from as distinct flowDiscardClass values
- This would result in additional values for direction (ingress/egress), address family (IPv4/IPv6), cast type (unicast/multicast), and QoS class
- This approach would provide a more complete mapping with the YANG model without dependencies, however, it would duplicate information already available through existing Information Elements

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Do we have consensus that this is the preferred approach?

1. draft-ietf-opsawg-discardmodel:
   a) IM (YANG)
   b) DM (YANG)
2. draft-evans-opsawg-ipfix-discard-class-ie
   a) IM (references draft-ietf-opsawg-discardmodel)
   b) DM (IPFIX IE)

The alternative would be to have a discrete draft for the information model, e.g.:

1. draft-ietf-opsawg-discardmodel
   a) IM (YANG)
2. draft-ietf-opsawg-…
   a) IM (references draft-ietf-opsawg-discardmodel)
   b) DM (YANG)
3. draft-evans-opsawg-ipfix-discard-class-ie
   a) IM (references draft-ietf-opsawg-discardmodel)
   b) DM (IPFIX IE)