Background

• Motivation
• Flow selection techniques
• Use of flow selection along the flow monitoring work flow
Motivation

• Resource optimization
  – Use and management of computing, memory, and network resources can be optimized thanks to the use of flow selection techniques

• Application requirements
  – A flexible flow monitoring system can underpin various applications with diverse requirements by properly selecting flows of interest

• Dynamic traffic analysis
  – Fine-grained or coarse-grained traffic analysis benefits from the use of flow selection strategies
Flow selection techniques

• Flow selection based on the content of the flow record
• Flow selection based on flow record arrival time
• Flow selection based on external events like the exhaustion of local resources
Denotes the process where the flow selection can take place.
Changes since -01 version

• Feedback from IETF 77
  – How does flow selection fit in with the IPFIX mediation framework?

• -02 version approach
  – Flow selection is integrated into the reference model of the IPFIX Mediation framework as an Intermediate Process (draft-ietf-ipfix-mediators-framework-07)
  – The selection function is performed at two different levels of the IPFIX framework architecture:
    • IPFIX Original Exporter
    • IPFIX Mediator
Flow selection as a function of the IPFIX Original Exporter

- Flow selection can apply during:
  - The metering process
  - The recording process
  - The exporting process
Flow selection during the metering process

- Flow state dependent packet sampling. Two examples:
  - If sampled packets belong to a flow of interest, then they are assigned to the corresponding flow, thus contributing to increase metrics in the flow record, otherwise they are discarded.
  - In case sampled packets are the first packets of a new flow, they are discarded so as to avoid the generation of a new flow record and then the consumption of either memory or computing resources.
Flow selection during the recording process

• Flow selection applies to the flow records stored in the flow cache
  – Flow records are selected and removed from the flow cache in order to make room to newly generated records
  – Timed-out flows are selected for being removed from the memory area devoted to containing flow information
Flow selection during the exporting process

- A subset of the flow records stored in the flow cache is selected to be exported and provided to the application
  - According to flow state dependent criteria/policies some flow records are moved from the flow cache to the collector
  - Depending on the application requirements some flow state parameters are assessed in order to identify worth exporting flow records
Flow selection as a mediation function

- Flow Exporting
- Flow Selection
- Collecting process

IPFIX Mediator

Flow records
Flow selection at mediator’s level

- The IPFIX mediator is in charge of further selecting flows within the subset of flow records being exported by the IPFIX exporter
  - More complex selection criteria
  - More fine-grained selection of the flow records to be exported
  - If an IPFIX Mediator interacts with a set of IPFIX Collectors, flow records arriving at the IPFIX Mediator might be selected based on the IPFIX Collector requesting flow information
Information model for exporting of flow selection information

- The information elements are defined in accordance with the IPFIX information model [RFC5102]
- Examples of information elements are:
  - FsMeter_UnmeasPacketCount, which counts the number of packets that have not been metered (due to the application of flow state dependent packet sampling)
  - FsExp_UnexportedPacketCount, which counts the number of packets contained in the not-exported flow records
Information model for configuration of flow selection techniques

- **selectionMethod**,  
  - identifies the method applied by the flow selection process

- **flowMaxAdmitFlowRecords**,  
  - specifies the maximum number of eligible flow records which might be created in the flow cache

- **flowRecordBytesSize**,  
  - specifies the minimum number of bytes which must be contained in a flow record in order that it is considered not eligible for removal
Way forward

• Better explain the motivation why flow state dependent packet sampling is in scope
• Provide more details about the role of flow selection in the mediation framework
• Solicit additional feedback/comments from WG
• Send the draft to the IESG