Sampling and Filtering Techniques for IP Packet Selection

draft-ietf-psamp-sample-tech-00.txt

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Scope of Document

- Terminology (later moved to framework)
- Information Models for Packet selection methods
  - What information needs to be provided to describe the method
  - Basis for
    - Configuration of methods
    - Reporting of technique in use to collector

Terminology

Use IPFIX terms:

- Metering, Exporting and Collection Process
- Observation Point
- Flow

Packet Selection

- Filtering
- Sampling
- Combinations

Filtering

- ***Deterministic*** function on parts of the ***packet content*** (header, payload)
- can emulate a pseudo random selection
- ➔ needs to process the packet for selection decision

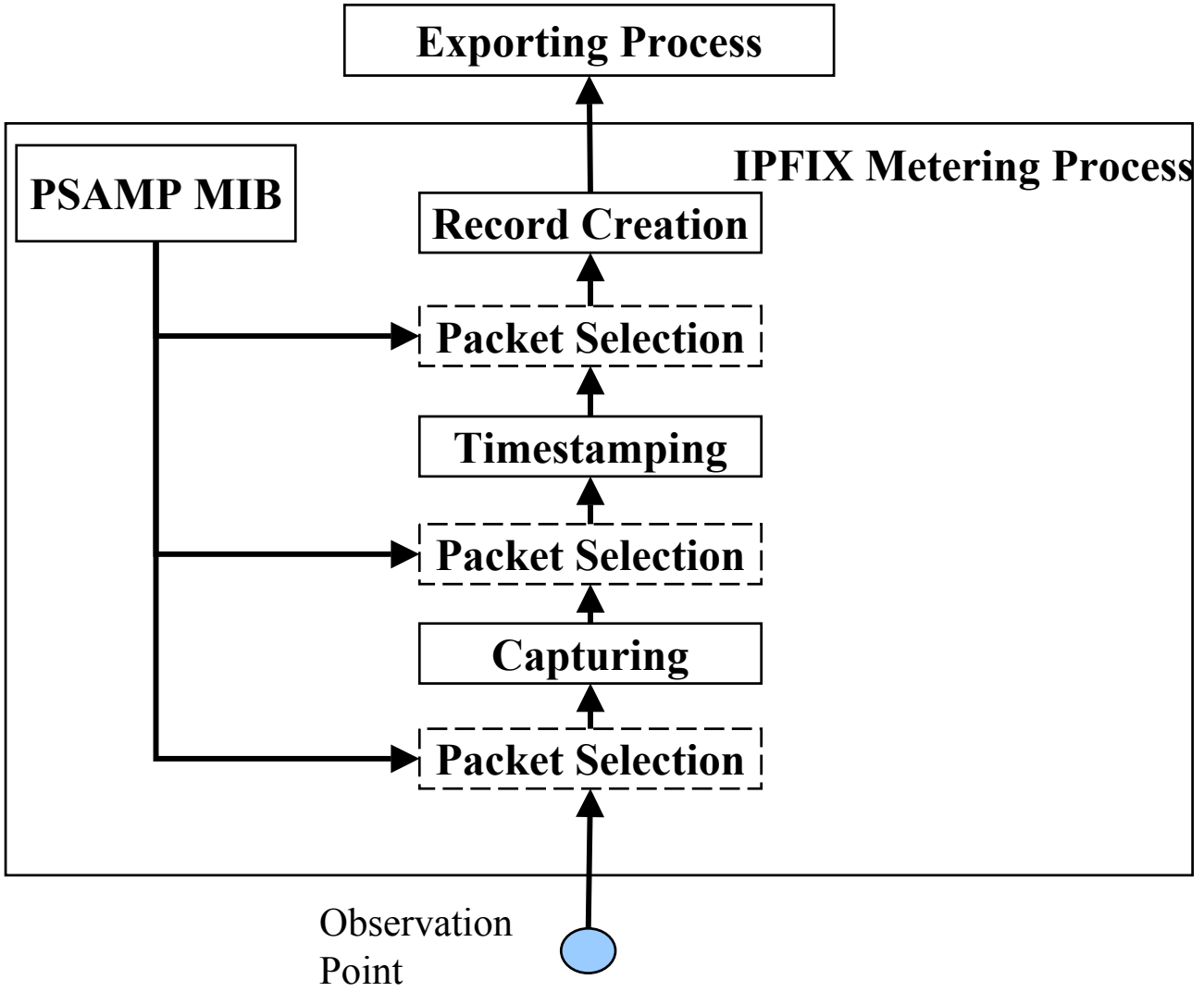
Sampling

- ***Deterministic*** or ***random*** function on temporal or spatial ***packet position*** or
- By performing ***random calculations*** per packet
- ➔ may need packet position

Packet Stream

- Input stream for selector
- Differs from IPFIX flow definition

Relation to IPFIX



Information Models

SELECTOR_ID
- Unique ID for Selector

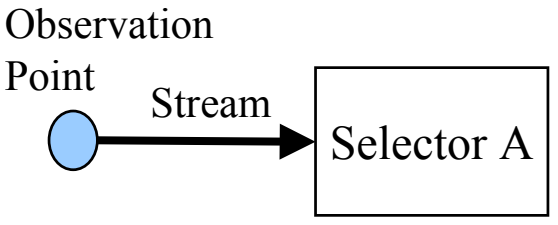
SELECTOR_TYPE
- Sampling algorithm
  - n-out-of-N
  - Systematic Time Based (STB)
  - Systematic Position Based (SPB)
  - Probabalistic
- Filtering method
  - Matching
  - Hashing
  - Router State

SELECTOR_PARAMETERS
- Input parameters for process (depend on SELECTOR_TYPE)

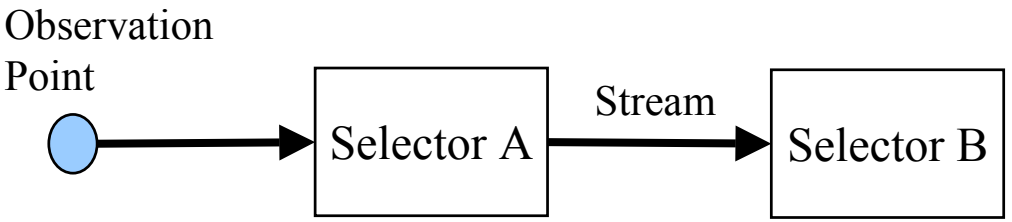
OPERATING_TIME
- Start/stop time of process

ASSOCIATIONS
- Stream ID (Observation Point ID or List of SELECTOR_IDs)
- Associations to IPFIX processes (metering, exporting)

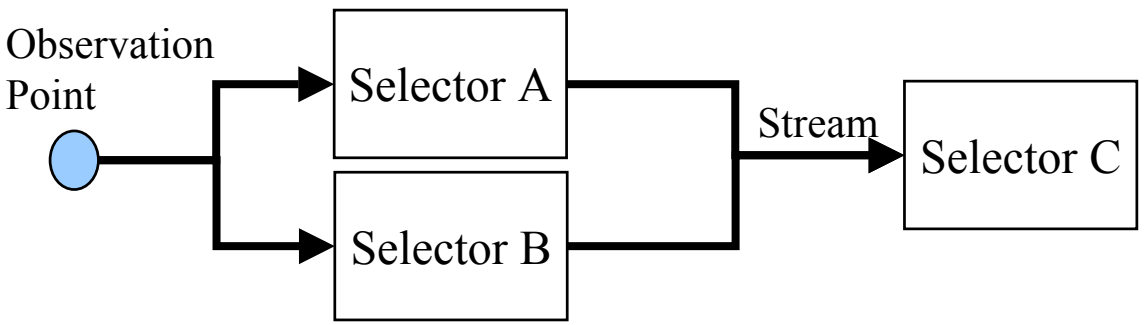
STREAM_ID



STREAM_ID:
- Observation Point ID



STREAM_ID:
- SELECTOR_ID A



STREAM_ID:
- SELECTOR_ID A
- SELECTOR_ID B

Parameters

- Sampling
  - Random Sampling
    - n-out-of-N
      - Sample fraction n/N
    - Probabilistic
      - Sampling probability p
  - Systematic Sampling (equally spaced)
    - Time Based (temporal packet position)
      - Interval length (in time)
      - Spacing
    - Position based (spatial packet position)
      - Interval length (in packets)
      - Spacing

Parameters

- Filtering
  - Matching
    - Bitmask or interval
    - For header, payload or both
  - Hashing
    - Considered bits
    - Hash function and parameters
  - Router State
    - Router state/treatment that triggers selection
- Composite Schemes
  - Combination of basis schemes
  - Concatenated via STREAM_ID definition

Open Issues

- Terminology
  - Agree on common terminology (sampling draft, framework draft, IPFIX)
  - Move section to framework document
- Categorization
  - Specify what input is required for the selection process
    - Filtering needs packet content
    - Sampling may need packet position
    - 3rd category for router state based filtering ?
  - Hashing
    - would be a form of filtering
    - But: pseudo random sampling can be achieved with hashing
  - Useful categorization ? Other proposals ? Needed at all ?

Open Issues

- IPFIX Relations
  - Packet selection as part of the IPFIX metering process
  - Associated IPFIX process
  - Alternative reporting protocols ?
  - will there be IDs for observation points and IPFIX processes ?
  - Specify location of packet selection component in metering process

Open Issues

- Focus on few standard selection methods ?
  - Which ?
  - How many ?
- Combined schemes
  - Linked
  - Or define as separate scheme
- Which aspects should be standardized ?
  - Schemes and Parameters
  - Configuration format
  - Reporting format
  - Configuration Protocol? SNMP ?
  - Reporting protocol ? IPFIX ?
- Further issues need to be covered ?

Thank you for your attention !

Questions ?

Opinions ?