IPFIX + LMAP

IETF 86 Orlando - LMAP BOF

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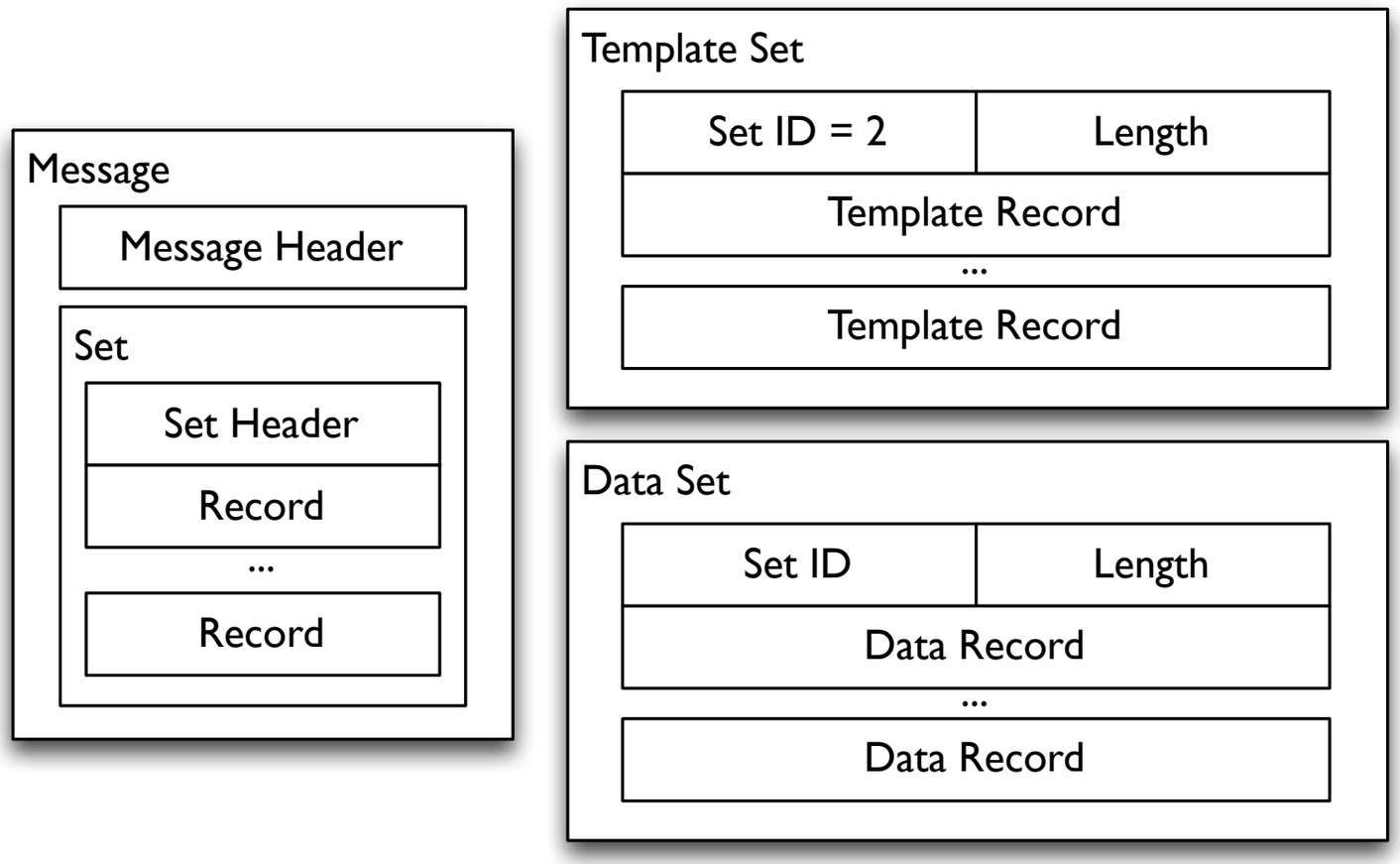
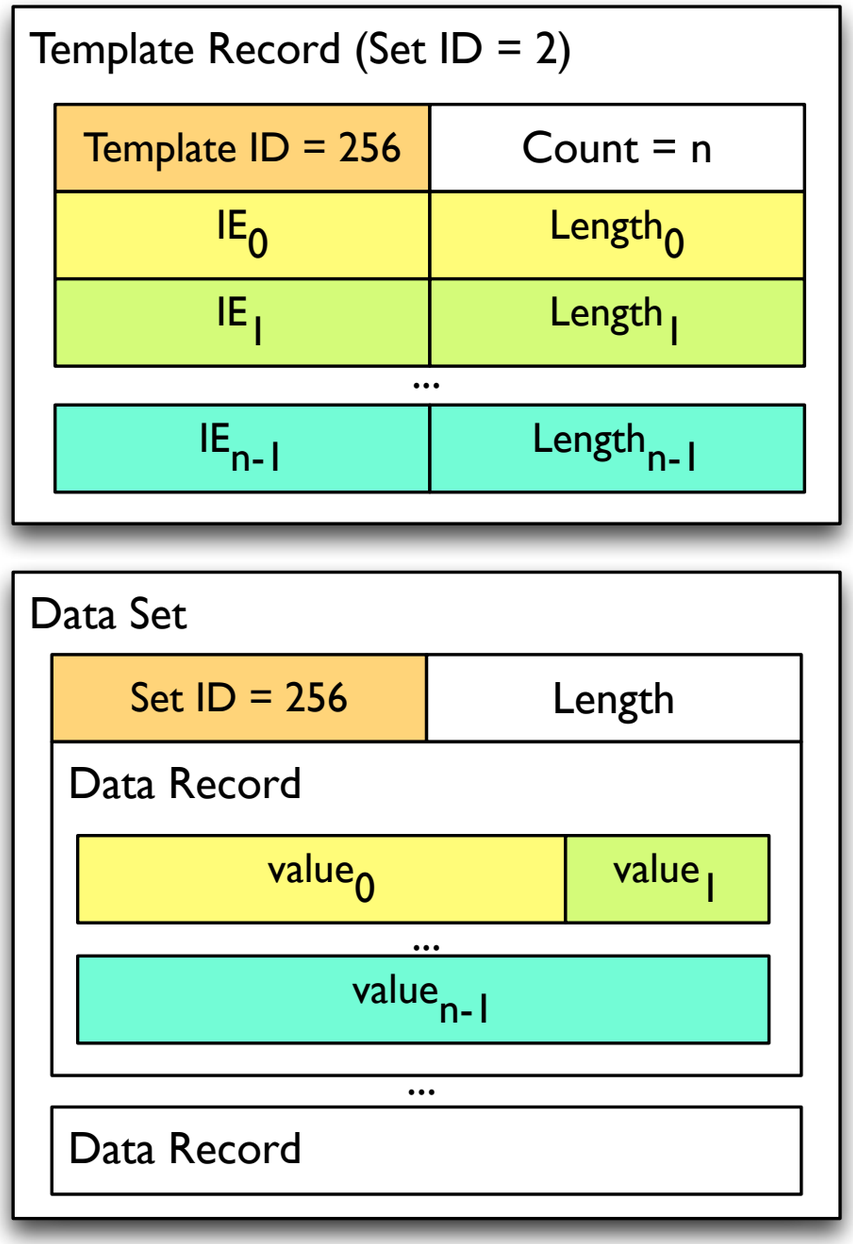
IPFIX in 180 seconds



- Message-oriented export over SCTP, TCP, UDP
- Flexible, self-describing templated format
- Efficient rep. of high-volume data w/ low semantic variability

Templates and IEs

- Data set IDs refer to Template IDs describing their structure
- Information Elements (IEs) in extensible IANA registry covering most common network elements



IPFIX + LMAP

- Exporting Process (EP) at MA
- Collecting Process (CP) at collector
- Use existing Message Header fields for certain parameters:
  - Test time in IPFIX Export Time
  - MA identifier as Observation Domain ID
- New IEs for parameters → new IPPM registry

Example

- Example: MA reporting UDP latency test:
  - 192.0.2.1:23677 -> 203.0.113.1:34567
  - 1pps uniform periodic, no cross traffic
  - 3sec, start @ 08:00:00 UTC
  - Latency with millisecond precision
- Test result looks like an IPFIX flow:
  - Timing given by flow interval
  - Additional IEs needed for test params

Template

- *metricIdentifier [→ metric in new IPPM registry]
- *testSchedule [→ new IPPM registry §3]
- *scheduleRate [events/sec]
- *outputType [raw, interval, mean → new IPPM registry §4]
- *testEnvironment [→ new IPPM registry §5]
- *sourceIPv4Address
- *destinationIPv4Address
- *sourceTransportPort
- *destinationTransportPort
- flowStartMilliseconds [singleton latency given by this interval]
- flowEndMilliseconds

Data Record

- *metricIdentifier = UDP latency
- *testSchedule = periodic
- *scheduleRate = 1.0
- *outputType = raw
- *testEnvironment = no cross-traffic
- *sourceIPv4Address = 192.0.2.1
- *destinationIPv4Address = 23677
- *sourceTransportPort = 203.0.113.1
- *destinationTransportPort = 34567
- flowStartMilliseconds = 08:00:00.019
- flowEndMilliseconds = 08:00:00.169 → ***150ms*** latency

IPFIX Options

Options Template Record (Set ID = 3)

Template ID = 257	Count = n
Scope Count = 1	
Scope IE_0	$Length_0$
IE_1	$Length_1$
...	
IE_{n-1}	$Length_{n-1}$

Template Record (Set ID = 2)

Template ID = 258	Count = n
IE_0	$Length_0$
IE_1	$Length_1$
...	
IE_{n-1}	$Length_{n-1}$

Data Set

Set ID = 257	Length

Data Record

$value_0$	$value_1$
...	
$value_{n-1}$	

...

Data Record

Data Set

Set ID = 258	Length

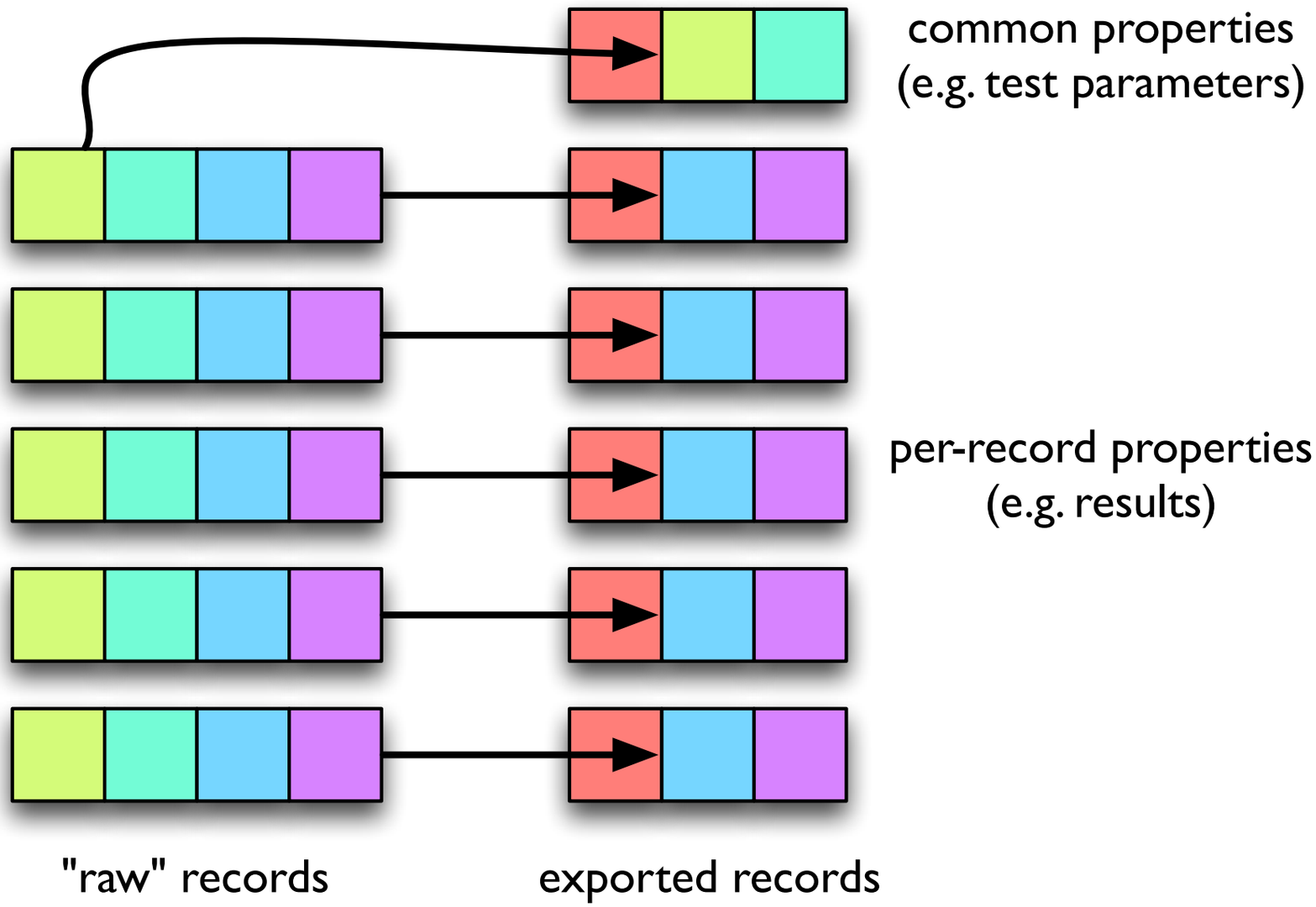
Data Record

$value_0$	$value_1$
...	
$value_{n-1}$	

...

Data Record

Applying Options



Template w/Options

- testIdentifier [scope]
- *metricIdentifier
- *testSchedule
- *scheduleRate
- *outputType
- *testEnvironment
- *sourceIPv4Address
- *destinationIPv4Address
- *sourceTransportPort
- *destinationTransportPort

- testIdentifier [scope]
- flowStartMilliseconds
- flowEndMilliseconds

Other Considerations

- Options increase efficiency...
  - ...and representation complexity
- Collector in-degree / federation via mediators