

Mediator-Specific Extensions to IPFIX Protocol and Information Model

draft-sommer-ipfix-mediator-ext-00

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Motivation

- Current IPFIX Protocol and Information Model:
 - Few means for bandwidth-efficient transport of Compound Flows
- This I-D presents several extensions, both independent and interdependent
 - New Template Set “Rich Template”
 - New abstract data types “ipv4Network”, “portRanges”
 - New data types “excludedPropertiesId”, “precedingRulePropertiesId”

Rich Template Set

- Structure identical to Template Set (Set ID 2)
- But individual records define Rich Templates

Set ID = 4	Length
Rich Template Record 1	
...	
Rich Template Record N	
Padding (opt)	

Rich Template

- Extends regular Template by allowing transport of:
 - Data field values (common to all Data Records)
 - Common Properties ID to refer to these values

Template ID (>255)	Field Count = n
Data Count = m	Common Properties ID
n Field Specifiers	
m Data Field Specifiers	
m Data Field Values	

ipv4Network

- Currently, IPv4 subnet addresses transmitted using two IPFIX information elements
 - Fast Flow selection and matching require two lookups per subnet
 - Templates contain two fields per subnet
- $\text{ipv4Network} = \text{ipv4Address unsigned8}$
 $\text{ipv4Network} = / 4^* (\text{unsigned8})$
- Transmission similar to “reduced size encoding”:
 - Three bytes, C0 00 02, to encode 192.0.2.0/24

portRanges

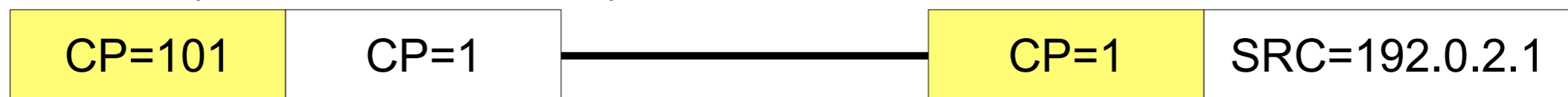
- Abstract data type to express: Lists, ranges, and lists-of-ranges of transport protocol ports
- `portRanges = *(unsigned16 unsigned16)`
`portRanges =/ unsigned16`

Port Ranges:	Hex Representation:
80	0050
1:7	0001 0007
80, 443	0050 0050 01BB 01BB
1:7, 80	0001 0007 0050 0050

excludedPropertiesId

- Opposite of commonPropertiesId
- Links to a set of Common Properties that the given Flow does NOT exhibit
- Semantics similar to boolean “and not” operation: “Excluded” excluded properties are included

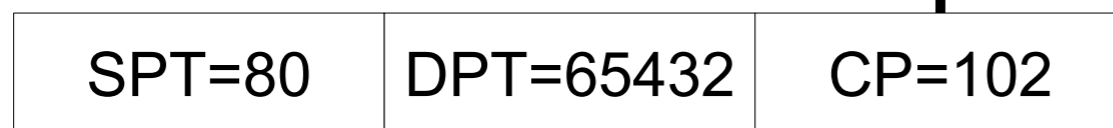
Rule 1: (Option Data Record)



Rule 2:



Flow:



precedingRulePropertiesId

- Identical to excludedPropertiesId, only behavior of transitive references differs:
- All directly or transitively referenced Common Properties are **NOT** exhibited by the given Flow

Rule 1: (Rich Template 1234, CP=101)

SRC=192.0.2.1

Rule 2: (Rich Template 1235)

DST=192.0.2.2

PP=101

Flow: (Based on Rich Template 1235)

SPT=80

DPT=65432

Summary

- `ipv4Network` reduces traffic volume and computational overhead
- `portRanges` facilitates transmission of (lists of) transport port ranges
- Two different approaches to efficiently transmit Common Properties and excluded properties:
 - `commonPropertiesId` & `excludedPropertiesId`
 - Rich Template and `precedingRulePropertiesId`