Export of Structured Data in IPFIX

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<draft-claise-structured-data-in-ipfix-00>

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Introduction

- **IPFIX has always been about flat records**

  Even if the Options Template could help

- **This draft is a extension to [RFC5101] and [RFC5102]**

  Support hierarchical structured data and lists (sequences) of Information Elements in data records

Business Case for Structured Data

- One security-centric example in the draft
  - Although this is not a security draft!
- Other examples:
  - MPLS stack
  - Traceroute
  - Performance metrics
  - Access-list
- Where:
  - Export from a branch office (limited bandwidth)
  - Use of mediation functions

Examples

userId	sourceIPv4Address	applicationId list
1	192.0.2.201	1001, 1002, 1003

			participant			
sigId	protocol Id	risk Rating	attacker ip	attacker appId	target ip	target appId(s)
1003	17	10	192.0.2.3	103		
			192.0.2.4	104	192.0.2.104	4001, 4002
			192.0.2.5	105		

New Abstract Data Types and Information Element: basicList

basicList

represents a list of zero or more instances of any single Information Element. Primarily used for single-valued data types.

For example, a list of port numbers, list of interface indexes, etc.

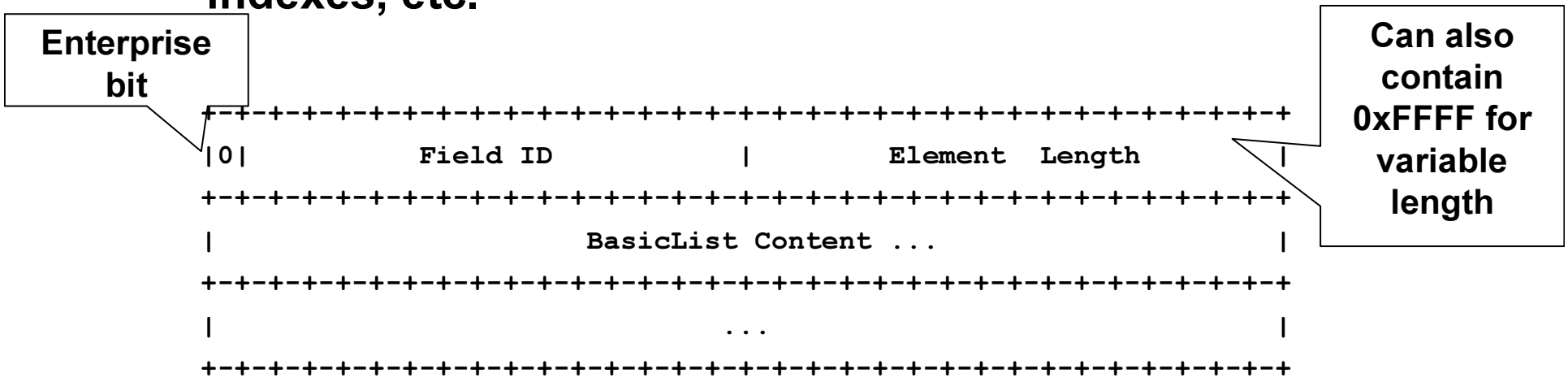


Figure A: basicList Information Element Encoding

New Abstract Data Types and Information Element: subTemplateList

subTemplateList

- **represents a list of zero or more instances of structured data, where the data type of each list element is the same and corresponds with a single Template Record.**
- **For example, structured data composed of multiple pairs of IP addresses**

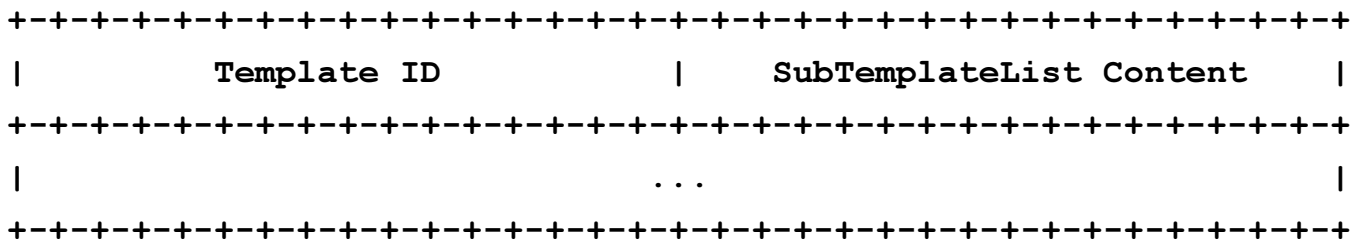


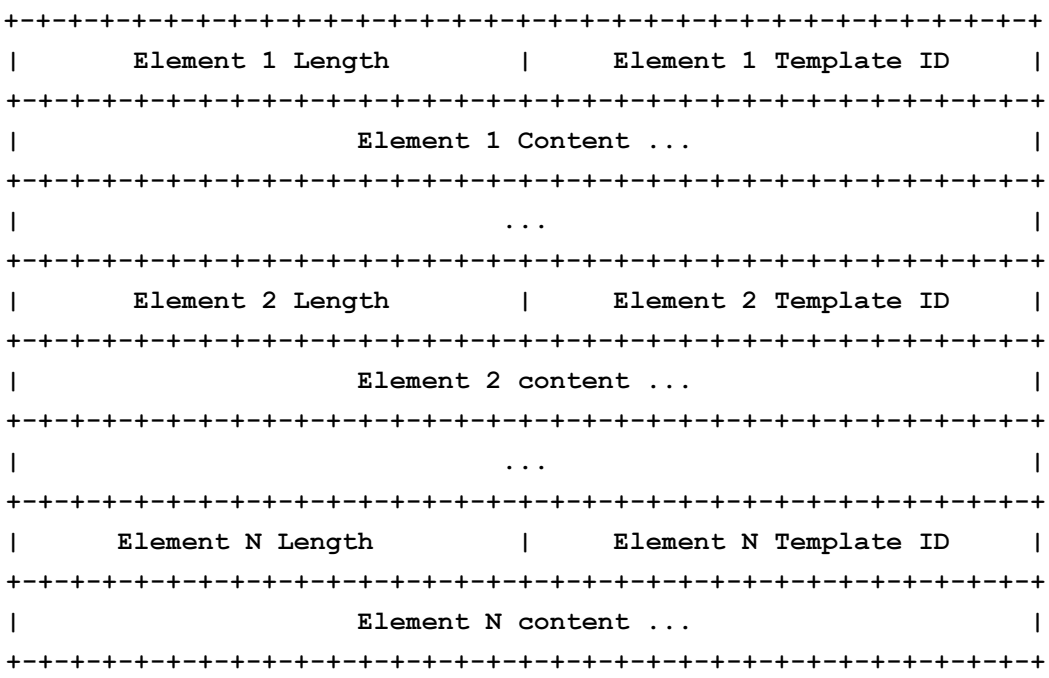
Figure E: subTemplateList Encoding

New Abstract Data Types and Information Element: subTemplateMultiList

subTemplateMultiList

represents a list of of zero or more instances of structured data, where the data type of each list element can be different and correspond with different template definitions.

For example, structured data composed of multiple access-list entries, where entries can be composed of different criteria types



What's the Next Step?

- Get some feedback
- To be addressed in the next version:
  - What about circular references
  - As scope, potentially useful
    - eg <this option> applies to <this list of items>
  - Usage Guidelines for Equivalent Data Representations