Yang Model for Data Export over IPFIX

draft-arokiarajseda-ipfix-data-export-yang-model

(formerly draft-boydseda-ipfix-psamp-bulk-data-yang-model)

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Introduction

- Reference
  - https://tools.ietf.org/html/draft-arokiarajseda-ipfix-data-export-yang-model

  Formerly - https://tools.ietf.org/html/draft-boydseda-ipfix-psamp-bulk-data-yang-model
- Broadband access market has requirements for using IPFIX for transporting bulk data
  - *"Bulk data collection is an automated collection of data from a device that is packaged together and delivered to an IPFIX collector"*
  - Bulk data goes beyond Packet SAMPling (PSAMP) data, e.g. it includes interface, subinterface, session statistics
- Also has requirements for using IPFIX for transporting bulk data associated with other protocols
  - Example: BBF TR-352 ICTP (Inter-Channel Transport Protocol) uses IPFIX to transport dynamic data (e.g., lease information) across participating NGPON2 (Next-Generation Passive Optical Network 2) systems

Analysis

- Have looked at the existing ietf-ipfix-psamp@2012-09-05 model (RFC 6728)
  - Single YANG module that performs PSAMP sampling
  - Collection process (PSAMP) and the IPFIX exporting process are part of the same YANG module
  - Only supports a PSAMP meter, and assumes the device supports SCTP
- Using this existing model is challenging for other IPFIX applications (e.g., TR-352 ICTP mentioned above)
  - Requires support for SCTP, therefore requiring the need for YANG deviations to announce non-support
  - Requires PSAMP meter to be configured, even if the observation point is already defined by other YANG models
- There are also some more general challenges (see the ID for details), e.g.
  - Interfaces are referenced via IF-MIB ifIndex rather than via ietf-interfaces interface name (RFC 8343)
- Conclusion
  - Don't believe it's possible to meet these requirements by augmenting the existing model
  - Prefer to develop a new YANG model where functionality is separated into different modules such that the functions can be independently leveraged

Previous Draft Model

https://tools.ietf.org/html/draft-boydseda-ipfix-psamp-bulk-data-yang-model

- Adheres to RFC 6728 general principles, with the following exceptions
  - Adopts and conforms to the latest RFC 8407 YANG guidelines, e.g. for identifier naming conventions
    - Is therefore not backwards-compatible
  - Adds support for RFC 8343 interface references
  - Model is separated into the following three modules
    - **ietf-ipfix**: Describes the IPFIX collector and exporter functions
    - **ietf-psamp**: Describes the PSAMP functions for configuring a device to sample/meter a subset of packets from the network
    - **ietf-bulk-data-export**: Describes the bulk data IPFIX templates and filtering functions to apply to bulk data (outside PSAMP bulk data application)
  - SCTP data nodes are made optional via the sctp feature for applications not requiring to support SCTP
  - IPFIX transport sessions allow transport session information to be retrieved individually
  - Source and destination address type choice statements are added to improve extensibility of the model
- Bulk data applications that use this RFC are expected to only need to import the applicable YANG modules, e.g.
  - PSAMP uses the ietf-ipfix and ietf-psamp modules
  - Statistics use the ietf-ipfix and ietf-bulk-data-export modules
  - TR-352 ICTP applications use only the ietf-ipfix module

New draft model

https://tools.ietf.org/html/draft-arokiarajseda-ipfix-data-export-yang-model

- Previous draft had support but was considered within IETF as too long (change in length was requested from Benoit, Rob Wilton, Gerhard Muenz)
- There was a change in editors.
- The updated draft
  - only addresses bulk data export and the IPFIX exporting process part of ietf-ipfix (needed for the bulk data export).
  - removed PSAMP, collecting process and is no longer obsoleting RFC 6728.
- This has resulted in the present text (excluding appendix, tree and YANG) being reduced to 16 pages long.
- The draft name has been changed to "IPFIX Data Export YANG model".
- The Tree Diagrams were moved to normative sections of the document (previously were in the appendix)
- No effort is made to define terms (instead terms used in this document refer back to RFC 7011).

Tree Diagram (abbreviated)

```
module: ietf-ipfix-data-export
  +--rw ipfix-data-export
    +--rw exporting-process* [name] {exporter}?
    |  +--rw name                   name-type
    |  +--rw enabled?               boolean
    |  +--rw export-mode?           identityref
    |  +--rw destination* [name]
    |  |  +--rw name       name-type
    |  |  +--rw exporter
    |  |     +--rw ipfix-version?            uint16
    |  |     +--rw source
    |  |     |  +--rw (source-method)?
    :
    |  |     +--rw destination
    :
    |  |     +--rw destination-port?          inet:port-number
    |  |     +--rw send-buffer-size?          uint32
    |  |     +--rw rate-limit?                uint32
    |  |     +--rw connection-timeout?        uint32
    |  |     +--rw retry-schedule?            uint32
    |  |     +--rw transport-layer-security!
    :
    |  |     +--ro transport-session
    :
    |  |       +--ro template* [name]
    :
    |  |          +--ro field* [name]
    :
    |  +--rw options* [name]
    :
    |  +--ro exporting-process-id?   uint32
    +--rw data-export
       +--rw template* [name]
          +--rw name                     name-type
          +--rw enabled?                 boolean
          +--rw export-interval?         uint32
          +--rw observation-domain-id?   uint32
          +--rw field-layout
          |  +--rw field* [name]
    :
          |     +--rw ie-length?            uint16
          |     +--rw ie-enterprise-number?   uint32
          +--rw exporting-process*        -> /ipfix-data-export/exporting-process/name {exporter}?
          +--rw (resource-identifier)?
          |  +--:(resource-instance)
          |     +--rw resource-instance*   resource
          +--ro data-records?             yang:counter64
          +--ro discontinuity-time?       yang:date-and-time
```

Next Steps

- OPSDIR requested that the document be an AD document.
  - Updated draft is reduced version of draft-boydseda-ipfix-psamp-bulk-data-yang-model which has incorporated IETF members feedback to date (including feedback from IETF YANG doctors).
  - draft-arokiarajseda-ipfix-data-export-yang-model (which incorporated feedback) was posted 2021-10-08 to opsawg mailing list.
  - Our understanding in the IETF process that as an AD document needs opsawg mailing list review.
    - No feedback to date
    - No opsawg meetings (until today) to present this draft.

Next Steps

- The benefits for moving forward with this draft is that it allows other SDOs like BBF to do augmentations over this IPFIX YANG model (see https://datatracker.ietf.org/liaison/1704/ BBF liaise related to IPFIX YANG).
- Request that the OPSAWG working group to review the draft and start providing feedback.
  - Move the document from an ID to WG Adoption.