

Exporting MIB variables using the IPFIX Protocol

IETF81, July 27th

draft-johnson-ipfix-mib-variable-export-02.txt

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- Abstract

This document specifies a way to complement IPFIX Flow Records with Management Base (MIB) objects, avoiding the need to define new IPFIX Information Elements for existing Management Information Base objects that are already fully specified.

This method requires an extension to the current IPFIX protocol. New Template Set and Options Template Sets are specified to allow the export of Simple Network Management Protocol (SNMP) MIB Objects along with IPFIX Information Elements.

- Two new versions since the last IETF meeting

New: Motivation and scope have been clarified

- Motivation
 - two data models for a unique information model, i.e. MIB and IPFIX information elements, which are overlapping
 - No synchronized counters between Flow and MIB counters
- Scope:
 - This mechanism applies to:
 - the addition of MIB variables to IPFIX Information Element in Flow Records
 - This mechanism doesn't apply to:
 - Configuration, as IPFIX is a PUSH mechanism
 - Though some config MIB objects could be exported

New Security Considerations

“For this extension to the IPFIX protocol, the same security considerations as for the IPFIX protocol apply [[RFC5101](#)].”

New Examples

5. Example Use Cases

Clarify the need for this draft

5.1. Multiple Templates

5.2. Non-indexed MIB Object: Established TCP Connections

5.3. Enterprise Specific MIB Object: Detailing CPU Load History

5.4. Indexed MIB Object with an IPFIX Information Element: Output Interface Queue Size in PSAMP Packet Report

5.5. Indexed MIB Object with an OID: Output Interface Queue Size in PSAMP Packet Report

5.6. Indexed MIB Object with multiple indices

5.7. Indexed MIB Objects with a mix of MIB OID and IPFIX Information Elements

5.8. Using MIB Objects as IPFIX Options Scope fields

5.8.1. Using non-Indexed MIB Objects as Option Scope fields

5.8.2. Using Indexed MIB Objects as Option Scope fields

5.9. Using MIB Objects with IPFIX Structured Data

Use of the E bit

The most
common case

MIB variable as
scope

Open Issues: SNMP Context

- “Each MIB OID is looked up in a specific context, usually the default context. If exporting a MIB OID value that isn't in the default context then the context string **MUST** be identified and associated with the MIB OID. This can be done on a per template basis by exporting an Options Template Record.”
- Do you see a use case for the export, within a single flow record, of MIB variables from different SNMP contexts?
 - So far, no

Open Issues

- If the index is a MIB oid, how does a Collector know the Field Length of the index object since the length it is not part of the template
 - Right now, Collector has to look up the MIB OID length. Not ideal
 - Proposal: add "Field Length" and "MIB OID Length" after the MIBObjectIdentifierMarker for indexed MIB indices
- Using MIB Objects with IPFIX Structured Data
 - Must have an example

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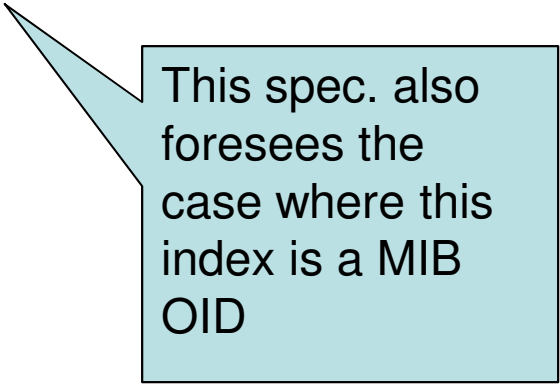
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BACKUP SLIDES

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Example 2: Indexed OID Export

- Example: export the queue counters with the flow record
- Template Record:
 - sourceIPv4Address (IPFIX IE)
 - destinationIPv4Address (IPFIX IE)
 - totalLengthIPv4 (IPFIX IE)
 - egressInterface (IPFIX IE)
 - outboundQueueLength (MIB OID)
indexed by: egressInterface (IPFIX IE)



This spec. also foresees the case where this index is a MIB OID

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Example 2: Indexed OID Export

New spec
implies a
new Set ID

One index

ifOutQLen

```

0          1          2          3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----+-----+-----+-----+
|          Set ID = TBD1          |          Length          |
+-----+-----+-----+-----+
|          Template ID = 257      |          Field Count = 5  |
+-----+-----+-----+-----+
|0|  IE = sourceIPv4Address      |          Field Length = 4  |
+-----+-----+-----+-----+
|0|  IE = destinationIPv4Address |          Field Length = 4  |
+-----+-----+-----+-----+
|0|  IE = totalLengthIPv4        |          Field Length = 4  |
+-----+-----+-----+-----+
|0|  IE = egressInterface        |          Field Length = 4  |
+-----+-----+-----+-----+
|0|  MIBObjectIdentifierMark      |          Field Length 1   |
+-----+-----+-----+-----+
| Index Count=1 | MIB OID Len=20 | MIB Object Identifier ... |
+-----+-----+-----+-----+
|                                     = "1.3.6.1.2.1.2.2.1.21" |
+-----+-----+-----+-----+
|          ... MIB Object Identifier continued ...          |
+-----+-----+-----+-----+
|          ... MIB Object Identifier continued ...          |
+-----+-----+-----+-----+
|          ... MIB Object Identifier continued ...          |
+-----+-----+-----+-----+
| ... MIB OID continued          |0|  IE = egressInterface    |
+-----+-----+-----+-----+

```

This is the
new IPFIX
spec.

This is the
index. In this
case, an
IPFIX IE

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IPFIX Implications

- Requires an extension to the current IPFIX Protocol:
 - New (Options) Template Sets
- Targeting Standard Track
 - Patent-7788371
 - IPR: <https://datatracker.ietf.org/ipr/1436/>
 - Would like to get a broad technology review

Next Steps

- Better explain the draft concept
- Add some more examples
- Juergen Schoenwalder's feedback
- Validate the security section
- And post version 01 ;-)