

Exporting MIB variables using the IPFIX Protocol

draft-johnson-ipfix-mib-variable-export-00.txt

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Abstract

This document specifies a way to export Management Information Base (MIB) objects within the IPFIX protocol, 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.

Presented at IETF79: OPS-AREA and IPFIX

No new version at the IETF80

The primary editor had different priorities and stopped participating

So we felt short on time

Exporting MIB variables using the IPFIX Protocol Why?

Foresee the need to export existing MIB fields

Requested by some collector partners,
and every proxy costs some money...

No synchronized counters between Flow and MIB counters

Potential flow expiration timeout

Then Flow Record exported

Then SNMPGet

Then SNMPGet Response

=> Flow and Counters not synchronized

Example: interface or QoS counters at the time the flow expired

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Why?

Data model replication: two data models for a unique information model (*), i.e. MIB and IPFIX information elements, which are overlapping.

For example, ingressInterface I.E. “The index of the IP interface where packets of this Flow are being received. The value matches the value of managed object 'ifIndex' as defined in RFC 2863.”

For example, interfaceName I.E. “See [[RFC2863](#)] for the definition of the ifName object.”

More requests in the future...

(*) RFC 3444, "On the Difference between Information Models and Data Models"

Exporting MIB variables using the IPFIX Protocol 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

This mechanism could be applied to:

Replacement of SNMP notification, though this is not the initial goal. There is already the EVENT & EXPRESSION MIBs mechanism to create customized SNMP notifications

Exporting MIB variables using the IPFIX Protocol MIB Object Access? Version 00

The IPFIX Metering Process is configured to access some MIB objects, but can these objects be monitored?

The Metering Process (*) MUST check whether or not the MIB variables can be accessed, and hence exported with IPFIX.

Therefore a read or read-write community string in SNMPv1 and SNMPv2c, or a principal in SNMPv3, MUST be associated with the Metering Process.

If the management entity supports the View-based Access Control Model (VACM) for the SNMP [[RFC3415](#)], then the Metering Process MUST validate with the View-Based Access Control [[RFC3415](#)] that the MIB object can be accessed before exporting its content.

If there is a view in case of SNMPv1 and SNMPv2c, the Metering Process MUST validate that the MIB object can be accessed before exporting its content.

(*) or the configuration process, to be discussed

Exporting MIB variables using the IPFIX Protocol MIB Object Access? Proposal

Proposal:

For this extension to the IPFIX protocol, the same security considerations as for the IPFIX protocol apply [RFC5101].

The access to MIB objects is controlled by the configuration of the IPFIX exporter. This is consistent with the way IPFIX controls access to other Information Elements in general. The configuration of an IPFIX exporter determines which MIB objects are included in IPFIX flow records sent to certain collectors.

Network operators should take care that only MIB objects are included in IPFIX flow records that the receiving flow collector is allowed to receive.

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Example 1: Non-index OID export

Example: CPU utilization percentage sent every 1 minute

TIMESTAMP	CPU BUSY PERCENTAGE
=====	=====
StartTime + 0 seconds	10%
StartTime + 60 seconds	14%
StartTime + 120 seconds	19%
StartTime + 180 seconds	16%

Template Record:

flowStartSeconds (IPFIX IE)

cpmCPUTotal1minRev (MIB OID)

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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

```

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 |
+-----+-----+-----+
| 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 ... |
+-----+-----+-----+
| = "1.3.6.1.2.1.2.1.21" |
+-----+-----+-----+
| ... MIB Object Identifier continued ... |
+-----+-----+-----+
| ... MIB Object Identifier continued ... |
+-----+-----+-----+
| ... MIB Object Identifier continued ... |
+-----+-----+-----+
| ... MIB OID continued |0| IE = egressInterface |
+-----+-----+-----+

```

New spec implies a new Set ID

One index

ifOutQLen

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 ;-)