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Definitions of Managed Objects for Packet Sampling
<[draft-ietf-psamp-mib-01.txt](#)>

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Abstract

This memo defines managed objects for packet sampling. These objects provide information about managed nodes supporting packet sampling, including packet sampling capabilities, configuration and statistics. They also allow to configure packet sampling concerning the IP interface at which packets are sampled, the packet selections methods used for sampling, and the collector to which packet samples are exported.

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October 2003

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1. Introduction

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

This document is a product of the Packet Sampling (PSAMP) working group. Its purpose is to define standards-based MIB modules for monitoring and configuring managed nodes performing packet sampling.

It is assumed that packet sampling is performed according to the framework defined in [PS-FMWK]. Packet selection methods considered in the MIB module are specified in [PS-PSEL]. Configuration of the export of samples to a collector is modeled according to [PS-TRSP].

[Section 2](#) describes the structure of the PSAMP MIB module and [Section 3](#) contains the formal definition. Security issues are discussed in [Section 5](#).

2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [[RFC3410](#)].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

3. Structure of the PSAMP MIB module

This first draft does not contain a complete PSAMP MIB module definition, but some essential components of it sketching the structure of the complete module. The sketch serves as input to a discussion of the MIB module structure, particular of the modelling of capabilities and configured packet sampling instances. Please find a (not complete) list of open issues at the end of the document.

The PSAMP-MIB module defined below contains three groups of objects: the methods group, the reporting group, and the instances group.

[3.1](#) The Methods Group

The first group of objects contains information about sampling methods. Each sampling method is covered by an individual sub-tree of this group. For each method, the following objects are defined: a single object indicating the availability of the method, a sub-group of objects indicating specific capabilities and limits of the method, and a sub-group specifying sets of parameters. Each parameter set uniquely specifies all parameters of a packet sampling instance of the method.

Methods and parameters of methods are specified in [draft-ietf-psamp-sample-tech-01.txt](#). So far, objects for four methods defined in this Internet drafts are contained in the PSAMP MIB module plus an additional trivial method. Further methods need to be added later. The five methods are selecting all, count-based systematic sampling, time-based systematic sampling, n-out-of-N random sampling and probabilistic sampling.

All methods contain a pointer (OID) to the next sampling method used after the current sampling method. Thus concatenation of sampling methods can be realized. Also all parameters sets contain a row status. TBD: Define usage of RowStatus.

[3.1.1](#) Selecting All Packets

This trivial packet selection method is always available. If it is applied, all packets will be selected.

[3.1.2](#) Count-based Systematic Sampling

Count-based systematic sampling is specified in Sections [4](#) and [5](#) of [draft-ietf-psamp-sample-tech-01.txt](#). The first object in this group is `psampSystematicCountBasedSamplingAvailability` indicating the availability of this method.

It is followed by a sub-group of objects specifying capabilities. `psampSystematicCountBasedSamplingMaxInterval` indicates the maximum sampling interval in packets supported by the implementation, `psampSystematicCountBasedSamplingMaxSpacing` indicates the maximum spacing in packets supported by the implementation.

Finally `psampSystematicCountBasedSamplingParameterSetTable` contains a parameter set in each of its entries that completely specifies a configuration of an instance of the packet sampling method. These parameter sets are not necessarily instantiated at the managed node, but for each instantiated parameter set of this method, there MUST be an entry in this table. The parameter set contains two parameters:

the sampling interval length and the spacing specified in numbers of packets.

[3.1.3](#) Time-based Systematic Sampling

Time-based systematic sampling is specified in Sections [4](#) and [5](#) of [draft-ietf-psamp-sample-tech-01.txt](#). The first object in this group is `psampSystematicTimeBasedSamplingAvailability` indicating the availability of this method.

It is followed by a sub-group of objects specifying capabilities. `psampSystematicTimeBasedSamplingMaxInterval` indicates the maximum sampling interval in microseconds supported by the implementation, `psampSystematicTimeBasedSamplingMaxSpacing` indicates the maximum spacing in microseconds supported by the implementation.

Finally `psampSystematicTimeBasedSamplingParameterSetTable` contains a

parameter set in each of its entries that completely specifies a configuration of an instance of the packet sampling method. These parameter sets are not necessarily instantiated at the managed node, but for each instantiated parameter set of this method, there MUST be an entry in this table. The parameter set contains two parameters: the sampling interval length and the spacing specified in microseconds.

[3.1.4](#) n-out-of-N Random Sampling

n-out-of-N Random sampling is specified in Sections [4](#) and [5](#) of [draft-ietf-psamp-sample-tech-01.txt](#). The first object in this group is psampRandomOutOfNSamplingAvailability indicating the availability of this method.

So far, the sub-group of objects specifying capabilities is empty for this method.

The psampRandomOutOfNSamplingParameterSetTable contains a parameter set in each of its entries that completely specifies a configuration of an instance of the packet sampling method. These parameter sets are not necessarily instantiated at the managed node, but for each instantiated parameter set of this method, there MUST be an entry in this table. The parameter set contains a single parameter only, the sampling rate.

[3.1.5](#) Probabilistic Sampling

Probabilistic sampling is specified in Sections [4](#) and [5](#) of [draft-ietf-psamp-sample-tech-01.txt](#). The first object in this group is psampRandomProbabilisticSamplingAvailability indicating the availability of this method.

So far, the sub-group of objects specifying capabilities is empty for this method.

The psampRandomProbabilisticSamplingParameterSetTable contains a parameter set in each of its entries that completely specifies a configuration of an instance of the packet sampling method. These parameter sets are not necessarily instantiated at the managed node,

but for each instantiated parameter set of this method, there MUST be an entry in this table. The parameter set contains a single parameter only, the sampling rate.

[3.2](#) The Reporting Group

The reporting group of managed objects provides information on collectors to which sampled packets are exported and they allow to configure collectors.

The group contains a two tables, the `psampCollectorTable` and the `psampCollectorGroupTable`. Each entry in the `psampCollectorTable` specifies a collector by its IP address, used transport protocol and port number. Also it contains the number of reports sent to this collector. The `psampCollectorGroupTable` groups one or more collectors to a set of collectors where sampled packets are sent to. Thus reporting to more than one collector at the same time is possible.

[3.3](#) The Instance Group

The instance group of managed objects provides information about active packet sampling instances at the managed node. It also allows to create new instances and to terminate them.

The group contains a single table, the `psampInstanceTable`. Each entry of this table describes an instance by the IP interface it is acting at, by the packet selection methods it is executing, and by the collector to which reports on sampled packets are sent. Furthermore a start and stop time can be given when the sampling method should run.

Each method is specified by a reference to a method-specific parameter set. This parameter set also defines a concatenated list of sampling methods if supported. Collectors are specified by an index of the `psampCollectorGroupTable`.

The following statistics is available for each instance: number of packets observed by the method.

[4.](#) Definitions

PSAMP-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, Integer32, mib-2
FROM SNMPv2-SMI -- [RFC2578](#)
TEXTUAL-CONVENTION, DateAndTime, RowStatus
FROM SNMPv2-TC -- [RFC2579](#)
MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF -- [RFC2580](#)
InterfaceIndex -- [RFC2863](#)
FROM IF-MIB
InetAddressType, InetAddress
FROM INET-ADDRESS-MIB; -- [RFC3291](#)

psampMIB MODULE-IDENTITY

LAST-UPDATED "200310240841Z" -- 24 October 2003
ORGANIZATION "IETF Packet Sampling Working Group"
CONTACT-INFO
"WG charter:
<http://www.ietf.org/html.charters/psamp-charter.html>

Mailing Lists:

General Discussion: psamp@ops.ietf.org
To Subscribe: psamp-request@ops.ietf.org
In Body: subscribe
Archive: <https://ops.ietf.org/lists/psamp/>

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DESCRIPTION

"The PSAMP MIB defines managed objects for packet sampling. These objects provide information about managed nodes supporting packet sampling, including packet sampling capabilities, configuration and statistics. They also allow to configure packet sampling concerning the IP interface at which packets are sampled, the packet selections methods used for sampling, and the collector to which packet samples are exported.

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-- RFC Ed.: replace yyyy with actual RFC number & remove this notice

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```
-- Revision history

REVISION      "200310240841Z"          -- 24 October 2003
DESCRIPTION
    "Initial version, published as RFC yyyy."
-- RFC Ed.: replace yyyy with actual RFC number & remove this notice

 ::= { mib-2 XXX }
-- XXX to be assigned by IANA.

-- Textual Conventions

PsampMethodAvailability ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "Used to report the availability of a packet selection method:

        available(1) - the method is supported and can be used
        notAvailable(2) - the method is not available"
    SYNTAX      INTEGER {
                    available(1),
                    notAvailable(2)
                }

-- Top level structure of the MIB

psampObjects      OBJECT IDENTIFIER ::= { psampMIB 1 }
psampConformance  OBJECT IDENTIFIER ::= { psampMIB 2 }

-- Packet selection methods group of objects

psampMethods      OBJECT IDENTIFIER ::= { psampObjects 1 }

-- Method 0: Selecting All Packets

psampSelectingAll OBJECT IDENTIFIER ::= { psampMethods 0 }

psampSelectingAllAvailability OBJECT-TYPE
    SYNTAX      PsampMethodAvailability
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "When retrieved, this object indicates the availability
```

```
    of the trivial method of selecting all packets."
    DEFVAL { available }
    ::= { psampSelectingAll 1 }
```

-- Method 1: Systematic Count-based Sampling

```
psampSystematicCountBasedSampling OBJECT IDENTIFIER ::= { psampMethods 1 }
```

```
psampSystematicCountBasedSamplingAvailability OBJECT-TYPE
```

```
    SYNTAX      PsampMethodAvailability
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "When retrieved, this object indicates the availability
         of systematic count-based sampling at the managed node."
```

```
    DEFVAL { notAvailable }
```

```
    ::= { psampSystematicCountBasedSampling 1 }
```

```
psampSystematicCountBasedSamplingCapabilities OBJECT IDENTIFIER
```

```
    ::= { psampSystematicCountBasedSampling 2 }
```

```
psampSystematicCountBasedSamplingMaxInterval OBJECT-TYPE
```

```
    SYNTAX      Integer32
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "When retrieved, this object indicates the the maximum
         number that can be specified for the sampling interval."
```

```
    ::= { psampSystematicCountBasedSamplingCapabilities 1 }
```

```
psampSystematicCountBasedSamplingMaxSpacing OBJECT-TYPE
```

```
    SYNTAX      Integer32
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "When retrieved, this object indicates the the maximum
         number that can be specified for the sampling spacing."
```

```
    ::= { psampSystematicCountBasedSamplingCapabilities 2 }
```

```
psampSystematicCountBasedSamplingParameterSetTable OBJECT-TYPE
```

```
    SYNTAX      SEQUENCE OF
```

```
        PsampSystematicCountBasedSamplingParameterSetEntry
```

```

MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "This table lists configurations of systematic count-
    based packet sampling.  A parameter set describing a
    configuration contains two parameters: the sampling
    interval length and the spacing."
 ::= { psampSystematicCountBasedSampling 3 }

```

```

psampSystematicCountBasedSamplingParameterSetEntry OBJECT-TYPE
SYNTAX        PsampSystematicCountBasedSamplingParameterSetEntry
MAX-ACCESS    not-accessible

```

```

STATUS        current
DESCRIPTION
    "Defines an entry in the
    psampSystematicCountBasedSamplingParameterSetTable."
INDEX { psampSystematicCountBasedSamplingIndex }
 ::= { psampSystematicCountBasedSamplingParameterSetTable 1 }

```

```

PsampSystematicCountBasedSamplingParameterSetEntry ::=
SEQUENCE {
    psampSystematicCountBasedSamplingIndex      Integer32,
    psampSystematicCountBasedSamplingInterval   Integer32,
    psampSystematicCountBasedSamplingSpacing    Integer32,
    psampSystematicCountBasedSamplingNext       OBJECT IDENTIFIER,
    psampSystematicCountBasedSamplingRowStatus  RowStatus
}

```

```

psampSystematicCountBasedSamplingIndex OBJECT-TYPE
SYNTAX        Integer32 (1..2147483647)
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "The index of this parameter set in the
    psampSystematicCountBasedSamplingParameterSetTable.
    It is used in entries of the psampInstanceTable as
    reference to this parameter set."
 ::= { psampSystematicCountBasedSamplingParameterSetEntry 1 }

```

```

psampSystematicCountBasedSamplingInterval OBJECT-TYPE
SYNTAX        Integer32

```

UNITS "number of packets"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "When retrieved, this object specifies the sampling
 interval for systematic count-based sampling."
 REFERENCE
 "[draft-ietf-psamp-sample-tech-01.txt, Section 5.1](#)"
 ::= { psampSystematicCountBasedSamplingParameterSetEntry 2 }

psampSystematicCountBasedSamplingSpacing OBJECT-TYPE
 SYNTAX Integer32
 UNITS "number of packets"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "When retrieved, this object specifies the sampling
 spacing for systematic count-based sampling."
 REFERENCE

Dietz, et al. [draft-ietf-psamp-mib-01.txt](#) [Page 11]

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"[draft-ietf-psamp-sample-tech-01.txt, Section 5.1](#)"
 ::= { psampSystematicCountBasedSamplingParameterSetEntry 3 }

psampSystematicCountBasedSamplingNext OBJECT-TYPE
 SYNTAX OBJECT IDENTIFIER
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "When retrieved, this object specifies the the next sampling
 method executed after the current sampling method."
 ::= { psampSystematicCountBasedSamplingParameterSetEntry 4 }

psampSystematicCountBasedSamplingRowStatus OBJECT-TYPE
 SYNTAX RowStatus
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "The status of this row of the table."
 ::= { psampSystematicCountBasedSamplingParameterSetEntry 5 }

-- Method 2: Systematic Time-based Sampling

psampSystematicTimeBasedSampling OBJECT IDENTIFIER ::= { psampMethods 2 }

psampSystematicTimeBasedSamplingAvailability OBJECT-TYPE

SYNTAX PsampMethodAvailability

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"When retrieved, this object indicates the availability
of systematic time-based sampling at the managed node."

DEFVAL { notAvailable }

::= { psampSystematicTimeBasedSampling 1 }

psampSystematicTimeBasedSamplingCapabilities OBJECT IDENTIFIER

::= { psampSystematicTimeBasedSampling 2 }

psampSystematicTimeBasedSamplingMaxInterval OBJECT-TYPE

SYNTAX Integer32

UNITS "microseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"When retrieved, this object indicates the the maximum
number that can be specified for the sampling interval."

::= { psampSystematicTimeBasedSamplingCapabilities 1 }

psampSystematicTimeBasedSamplingMaxSpacing OBJECT-TYPE

SYNTAX Integer32

UNITS "microseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"When retrieved, this object indicates the the maximum
number that can be specified for the sampling spacing."

::= { psampSystematicTimeBasedSamplingCapabilities 2 }

psampSystematicTimeBasedSamplingParameterSetTable OBJECT-TYPE

SYNTAX SEQUENCE OF

PsampSystematicTimeBasedSamplingParameterSetEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table lists configurations of systematic time-based packet sampling. A parameter set describing a configuration contains two parameters: the sampling interval length and the spacing."

::= { psampSystematicTimeBasedSampling 3 }

psampSystematicTimeBasedSamplingParameterSetEntry OBJECT-TYPE
SYNTAX PsampSystematicTimeBasedSamplingParameterSetEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Defines an entry in the
psampSystematicTimeBasedSamplingParameterSetTable."
INDEX { psampSystematicTimeBasedSamplingIndex }
::= { psampSystematicTimeBasedSamplingParameterSetTable 1 }

PsampSystematicTimeBasedSamplingParameterSetEntry ::=

SEQUENCE {
psampSystematicTimeBasedSamplingIndex Integer32,
psampSystematicTimeBasedSamplingInterval Integer32,
psampSystematicTimeBasedSamplingSpacing Integer32,
psampSystematicTimeBasedSamplingNext OBJECT IDENTIFIER,
psampSystematicTimeBasedSamplingRowStatus RowStatus
}

psampSystematicTimeBasedSamplingIndex OBJECT-TYPE
SYNTAX Integer32 (1..2147483647)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The index of this parameter set in the
psampSystematicTimeBasedSamplingParameterSetTable.
It is used in entries of the psampInstanceTable as

reference to this parameter set."

::= { psampSystematicTimeBasedSamplingParameterSetEntry 1 }

psampSystematicTimeBasedSamplingInterval OBJECT-TYPE
SYNTAX Integer32
UNITS "microseconds" -- might still be too coarse grained
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"When retrieved, this object specifies a sampling interval for systematic time-based sampling."

REFERENCE

["draft-ietf-psamp-sample-tech-01.txt, Section 5.1"](#)

::= { psampSystematicTimeBasedSamplingParameterSetEntry 2 }

psampSystematicTimeBasedSamplingSpacing OBJECT-TYPE

SYNTAX Integer32

UNITS "microseconds" -- might still be too coarse grained

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"When retrieved, this object specifies a sampling spacing for systematic time-based sampling."

REFERENCE

["draft-ietf-psamp-sample-tech-01.txt, Section 5.1"](#)

::= { psampSystematicTimeBasedSamplingParameterSetEntry 3 }

psampSystematicTimeBasedSamplingNext OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"When retrieved, this object specifies the the next sampling method executed after the current sampling method."

::= { psampSystematicTimeBasedSamplingParameterSetEntry 4 }

psampSystematicTimeBasedSamplingRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this row of the table."

::= { psampSystematicTimeBasedSamplingParameterSetEntry 5 }

-- Method 3: Random n-out-of-N Sampling

psampRandomOutOfNSampling OBJECT IDENTIFIER ::= { psampMethods 3 }

psampRandomOutOfNSamplingAvailability OBJECT-TYPE


```

SYNTAX      PsampMethodAvailability
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "When retrieved, this object indicates the availability
    of random n-out-of-N sampling at the managed node."
DEFVAL { notAvailable }
::= { psampRandomOutOfNSampling 1 }

psampRandomOutOfNSamplingCapabilities OBJECT IDENTIFIER
::= { psampRandomOutOfNSampling 2 }

-- No capabilities defined, yet.

psampRandomOutOfNSamplingParameterSetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF
                  PsampRandomOutOfNSamplingParameterSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists configurations of random n-out-of-N
        sampling. A parameter set describing a configuration
        contains a single parameter only: the sampling rate."
    ::= { psampRandomOutOfNSampling 3 }

psampRandomOutOfNSamplingParameterSetEntry OBJECT-TYPE
    SYNTAX      PsampRandomOutOfNSamplingParameterSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Defines an entry in the
        psampRandomOutOfNSamplingParameterSetTable."
    INDEX { psampRandomOutOfNSamplingIndex }
    ::= { psampRandomOutOfNSamplingParameterSetTable 1 }

PsampRandomOutOfNSamplingParameterSetEntry ::=
    SEQUENCE {
        psampRandomOutOfNSamplingIndex      Integer32,
        psampRandomOutOfNSamplingRate       Integer32,
        psampRandomOutOfNSamplingNext       OBJECT IDENTIFIER,
        psampRandomOutOfNSamplingRowStatus  RowStatus
    }

psampRandomOutOfNSamplingIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current

```

DESCRIPTION

"The index of this parameter set in the
psampRandomOutOfNSamplingParameterSetTable.
It is used in entries of the psampInstanceTable as
reference to this parameter set."

::= { psampRandomOutOfNSamplingParameterSetEntry 1 }

psampRandomOutOfNSamplingRate OBJECT-TYPE

SYNTAX Integer32

UNITS "1/1000000"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"When retrieved, this object specifies a sampling
rate for random n-out-of-N sampling."

REFERENCE

["draft-ietf-psamp-sample-tech-01.txt, Section 5.2"](#)

::= { psampRandomOutOfNSamplingParameterSetEntry 2 }

psampRandomOutOfNSamplingNext OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"When retrieved, this object specifies the the next sampling
method executed after the current sampling method."

::= { psampRandomOutOfNSamplingParameterSetEntry 3 }

psampRandomOutOfNSamplingRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this row of the table."

::= { psampRandomOutOfNSamplingParameterSetEntry 4 }

-- Method 4: Random Probabilistic Sampling

psampRandomProbabilisticSampling OBJECT IDENTIFIER ::= { psampMethods 4 }

psampRandomProbabilisticSamplingAvailability OBJECT-TYPE

SYNTAX PsampMethodAvailability

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"When retrieved, this object indicates the availability

of random probabilistic sampling at the managed node."
DEFVAL { notAvailable }

```
 ::= { psampRandomProbabilisticSampling 1 }

psampRandomProbabilisticSamplingCapabilities OBJECT IDENTIFIER
 ::= { psampRandomProbabilisticSampling 2 }

-- No capabilities defined, yet.

psampRandomProbabilisticSamplingParameterSetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF
                  PsampRandomProbabilisticSamplingParameterSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists configurations of random probabilistic
        sampling. A parameter set describing a configuration
        contains a single parameter only: the sampling rate."
    ::= { psampRandomProbabilisticSampling 3 }

psampRandomProbabilisticSamplingParameterSetEntry OBJECT-TYPE
    SYNTAX      PsampRandomProbabilisticSamplingParameterSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Defines an entry in the
        psampRandomProbabilisticSamplingParameterSetTable."
    INDEX { psampRandomProbabilisticSamplingIndex }
    ::= { psampRandomProbabilisticSamplingParameterSetTable 1 }

PsampRandomProbabilisticSamplingParameterSetEntry ::=
    SEQUENCE {
        psampRandomProbabilisticSamplingIndex      Integer32,
        psampRandomProbabilisticSamplingRate        Integer32,
        psampRandomProbabilisticSamplingNext        OBJECT IDENTIFIER,
        psampRandomProbabilisticSamplingRowStatus   RowStatus
    }

psampRandomProbabilisticSamplingIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
```

```

STATUS      current
DESCRIPTION
    "The index of this parameter set in the
    psampRandomProbabilisticSamplingParameterSetTable.
    It is used in entries of the psampInstanceTable as
    reference to this parameter set."
 ::= { psampRandomProbabilisticSamplingParameterSetEntry 1 }

```

psampRandomProbabilisticSamplingRate OBJECT-TYPE

```

SYNTAX      Integer32
UNITS       "1/1000000"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "When retrieved, this object specifies a sampling
    rate for random probabilistic sampling."
REFERENCE
    "draft-ietf-psamp-sample-tech-01.txt, Section 5.2"
 ::= { psampRandomProbabilisticSamplingParameterSetEntry 2 }

```

psampRandomProbabilisticSamplingNext OBJECT-TYPE

```

SYNTAX      OBJECT IDENTIFIER
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "When retrieved, this object specifies the the next sampling
    method executed after the current sampling method."
 ::= { psampRandomProbabilisticSamplingParameterSetEntry 3 }

```

psampRandomProbabilisticSamplingRowStatus OBJECT-TYPE

```

SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of this row of the table."
 ::= { psampRandomProbabilisticSamplingParameterSetEntry 4 }

```

-- Reporting Group

```

psampReporting      OBJECT IDENTIFIER ::= { psampObjects 2 }

```

```

psampCollectorTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PsampCollectorEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists collectors to which sampled packets are
        exported."
    ::= { psampReporting 1 }

psampCollectorEntry OBJECT-TYPE
    SYNTAX      PsampCollectorEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Defines an entry in the psampCollectorTable."
    INDEX { psampCollectorIndex }

```

```

::= { psampCollectorTable 1 }

PsampCollectorEntry ::= SEQUENCE {
    psampCollectorIndex                Integer32,
    psampCollectorTargetIpAddressType  InetAddressType,
    psampCollectorTargetIpAddress      InetAddress,
    psampCollectorTargetProtocol       Integer32,
    psampCollectorTargetPort           Integer32,
    psampCollectorReportsSent          Integer32,
    psampCollectorRowStatus            RowStatus
}

psampCollectorIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The locally arbitrary, but unique identifier of
        a collector.

        The value is expected to remain constant at least from one
        re-initialization of the entity's network management system
        to the next re-initialization."
    ::= { psampCollectorEntry 1 }

```

psampCollectorTargetIpAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The IP address type of the collector."
 ::= { psampCollectorEntry 2 }

psampCollectorTargetIpAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The IP address of the collector."
 ::= { psampCollectorEntry 3 }

psampCollectorTargetProtocol OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The transport protocol used for exporting sampled
 packets to the collector. Allowed values are ... "

::= { psampCollectorEntry 4 }

psampCollectorTargetPort OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The port number of the collector."
 ::= { psampCollectorEntry 5 }

psampCollectorReportsSent OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of reports sent to the collector."
 ::= { psampCollectorEntry 6 }

psampCollectorRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this row of the table."

::= { psampCollectorEntry 7 }

psampCollectorGroupTable OBJECT-TYPE

SYNTAX SEQUENCE OF PsampCollectorGroupEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table lists groups of collectors to which sampled packets are exported. If sampled packets are exported to only one collector the group consists of exactly one collector."

::= { psampReporting 2 }

psampCollectorGroupEntry OBJECT-TYPE

SYNTAX PsampCollectorGroupEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Defines an entry in the psampCollectorGroupTable."

INDEX { psampCollectorGroupIndex, psampCollectorGroupCollectorIndex }

::= { psampCollectorGroupTable 1 }

PsampCollectorGroupEntry ::= SEQUENCE {

psampCollectorGroupIndex

Integer32,

psampCollectorGroupCollectorIndex

Integer32,

psampCollectorGroupRowStatus

RowStatus

}

psampCollectorGroupIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The locally arbitrary, but unique identifier of a collector group."

The value is expected to remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."

::= { psampCollectorGroupEntry 1 }

psampCollectorGroupCollectorIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The index of a collector defined in the psampCollectorTable."

::= { psampCollectorGroupEntry 2 }

psampCollectorGroupRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this row of the table."

::= { psampCollectorGroupEntry 3 }

-- Instance Group

psampInstances OBJECT IDENTIFIER ::= { psampObjects 3 }

psampInstanceTable OBJECT-TYPE

SYNTAX SEQUENCE OF PsampInstanceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table lists active instances of packet sampling at the managed node."

::= { psampInstances 1 }

psampInstanceEntry OBJECT-TYPE

SYNTAX PsampInstanceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Defines an entry in the psampInstanceTable."


```

INDEX { psampInstanceIndex }
 ::= { psampInstanceTable 1 }

PsampInstanceEntry ::= SEQUENCE {
    psampInstanceIndex          Integer32,
    psampInstanceIfIndex        InterfaceIndex,
    psampInstanceStartTime      DateAndTime,
    psampInstanceStopTime       DateAndTime,
    psampInstanceParameterSet   OBJECT IDENTIFIER,
    psampInstanceCollectorGroupIndex Integer32,
    psampInstancePacketsObserved Integer32,
    psampInstanceReportsSent     Integer32,
    psampInstanceRowStatus      RowStatus
}

psampInstanceIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The locally arbitrary, but unique identifier of
        an instance.

        The value is expected to remain constant at least from one
        re-initialization of the entity's network management system
        to the next re-initialization."
    ::= { psampInstanceEntry 1 }

psampInstanceIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Index of the IP interface at which the packet stream
        is observed by packet selection method 1."
    ::= { psampInstanceEntry 2 }

psampInstanceStartTime OBJECT-TYPE
    SYNTAX      DateAndTime
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The date and time when collecting samples for this parameter
        set should start."

```

```
::= { psampInstanceEntry 3 }
```

psampInstanceStopTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The date and time when collecting samples for this parameter set should stop."

```
::= { psampInstanceEntry 4 }
```

psampInstanceParameterSet OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The OID of a parameter set in one of the method-specific tables in the Methods group.

The identified method is applied to the stream of packets observed at the interface."

```
::= { psampInstanceEntry 5 }
```

psampInstanceCollectorGroupIndex OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The index of the collector group to which packet reports are sent."

```
::= { psampInstanceEntry 6 }
```

psampInstancePacketsObserved OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of packets observed by method before selecting packets."

```
::= { psampInstanceEntry 7 }
```

psampInstanceReportsSent OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of reports on sampled packets sent to the collector."

```
::= { psampInstanceEntry 8 }
```

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```
psampInstanceRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The status of this row of the table."
    ::= { psampInstanceEntry 9 }

-- Conformance information
-- Compliance statements

psampCompliances OBJECT IDENTIFIER ::= { psampConformance 1 }
psampGroups      OBJECT IDENTIFIER ::= { psampConformance 2 }

-- Compliance statements

psampCompliance MODULE-COMPLIANCE
    STATUS       current
    DESCRIPTION
        "The compliance statement for the PSAMP-MIB."
    MODULE      -- this module
        MANDATORY-GROUPS { psampGroup }
    ::= { psampCompliances 1 }

-- MIB groupings

psampGroup OBJECT-GROUP
    OBJECTS {
        psampSelectingAllAvailability,
        psampSystematicCountBasedSamplingAvailability,
        psampSystematicCountBasedSamplingMaxInterval,
        psampSystematicCountBasedSamplingMaxSpacing,
        psampSystematicCountBasedSamplingInterval,
        psampSystematicCountBasedSamplingSpacing,
        psampSystematicCountBasedSamplingNext,
        psampSystematicCountBasedSamplingRowStatus,
        psampSystematicTimeBasedSamplingAvailability,
        psampSystematicTimeBasedSamplingMaxInterval,
        psampSystematicTimeBasedSamplingMaxSpacing,
        psampSystematicTimeBasedSamplingInterval,
```

```
psampSystematicTimeBasedSamplingInterval,  
psampSystematicTimeBasedSamplingSpacing,  
psampSystematicTimeBasedSamplingNext,  
psampSystematicTimeBasedSamplingRowStatus,  
psampRandomOutOfNSamplingAvailability,  
psampRandomOutOfNSamplingRate,  
psampRandomOutOfNSamplingNext,  
psampRandomOutOfNSamplingRowStatus,
```

```
psampRandomProbabilisticSamplingAvailability,  
psampRandomProbabilisticSamplingRate,  
psampRandomProbabilisticSamplingNext,  
psampRandomProbabilisticSamplingRowStatus,  
psampCollectorTargetIpAddressType,  
psampCollectorTargetIpAddress,  
psampCollectorTargetProtocol,  
psampCollectorTargetPort,  
psampCollectorReportsSent,  
psampCollectorRowStatus,  
psampCollectorGroupRowStatus,  
psampInstanceIfIndex,  
psampInstanceStartTime,  
psampInstanceStopTime,  
psampInstanceParameterSet,  
psampInstanceCollectorGroupIndex,  
psampInstancePacketsObserved,  
psampInstanceReportsSent,  
psampInstanceRowStatus
```

```
}
```

```
STATUS current
```

```
DESCRIPTION
```

```
    "The group of all accessible objects of the PSAMP MIB."
```

```
 ::= { psampGroups 1 }
```

```
END
```

[5. Security Considerations](#)

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network

environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

To be done.

6. Open Issues

- o describe row status objects to writable tables
- o support for reporting from a single instance to multiple collectors may be refined
- o elaborate conformance statements

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- o complete security considerations
- o observed packets may be expanded to number of packets before sampling and after sampling or something similar.
- o align wording with the other draft documents (e.g. instance vs. selector)
- o ...

7. Acknowledgment

This document is a product of the PSAMP working group.

Normative References

- [RFC2578] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#),

April 1999.

Informative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.

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