

IPPM metrics registry

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Abstract

This memo defines a registry of the IPPM working group metrics. It provides an OBJECT IDENTIFIER to each metric currently standardized by the IPPM WG. It defines the rules for the identification of the metrics standardized in the future.

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[1.](#) Introduction

This memo defines a registry of the IPPM working group metrics. It provides an OBJECT IDENTIFIER to each metric currently standardized by the IPPM WG. It defines the rules for the identification of the metrics standardized in the future.

[2.](#) The IPPM Framework

The IPPM Framework consists in four major components:

- + A general framework for defining performance metrics, described in the Framework for IP Performance Metrics, [RFC 2330](#);
- + A set of standardized metrics, which conform to this framework. The IPPM Metrics for Measuring Connectivity, [RFC 2678](#) [2]. The One-way Delay Metric for IPPM, [RFC 2679](#) [3]. The One-way Packet Loss Metric for IPPM, [RFC 2680](#) [4]. The Round-trip Delay Metric for IPPM, [RFC 2681](#) [5];
- + Emerging metrics which are being specified in respect of this framework;
- + The IPPM-REPORTING-MIB for reporting the results of the measures and for interfacing heterogeneous measurement systems with management entities.

[3.](#) Overview

This memo defines a registry of the current metrics and a framework for the integration of the future metrics for the following reasons:

- + to permit metrics to be clearly referenced by MIBs or other data models;
- + Metrics identifiers are needed to allow measurement interoperability;

special + Specification of new metrics is a continuous process,
care must be taken for the integration of the future
standardized metrics.

4. IPPM metrics Registry framework

MIBs need OBJECT IDENTIFIER to refer precisely to the standardized
metrics. The registry associates an OBJECT IDENTIFIER to each metric.

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As an example oneWayDelay and oneWayDelayPoissonStream have different identifiers.

The registry has 2 root branches. The category of the document determines the node the branch the metric is identified in:

- + Metrics defined in a RFC are identified in the 'rfc' tree;
- + Metrics defined elsewhere may be identified in the 'other'

tree.

The name of the metric has to respect ASN.1 constraints. The name has to start with a lower case. The letter - is forbidden (more or less) in the name. In a way to preserve the readability of the metric name the letters following a - are forced to upper case.

Sometime the name of the metric starts with 'Type-P'. It depends on the document not the semantic of the metric. In the registry it is removed from the name of the metric to reduce the length of the name and to uniform the metrics names.

Each metrics specification will include a section describing its metrics identifiers.

4.1. Metrics registry template

Each memo includes a registry where are identified the metrics. The name of the section where is defined the registry terminate by 'metrics registry'. The registry is defined using a MODULE-IDENTITY macro. Each metric is identify in the registry using a OBJECT-IDENTITY macro. The identification defines the metric name, status, reference and OBJECT IDENTIFIER.

```
IPPM-XXX-METRICS-REGISTRY DEFINITIONS ::= BEGIN
```

```
    XXXMetricsRegistry MODULE-IDENTITY
        DESCRIPTION
            " This memo defines a registry for XXX metrics."
        ::= { xxx N }

    xxxMetric1Name OBJECT-IDENTITY
        DESCRIPTION
            "The identifier for the metric1."
        REFERENCE
            "xxx, section x."
        ::= { rfc i }

    xxxMetric2Name OBJECT-IDENTITY
```

DESCRIPTION

"The identifier for the metric1."

REFERENCE

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```
        "xxx, section y."  
 ::= { rfc j }
```

END

4.2. Initial IPPM metrics registry

Metrics specified in a RFC of the WG IPPM are registered in the node rfc(1). They are numbered using the RFC order and the metrics definitions order in each memo. The value assigned to a metric is definitive and cannot be reused.

These rules are applied to create the first IPPM the registry. The metrics already standardized are registered in the section named 'IPPM metrics registry' of this memo.

4.3. IPPM registry management

Usually, metrics are implemented during the specification process. At this step, a metric is not identified as an IPPM metric. There is a need to provide temporary metric identifiers to facilitate software integration and to permit interoperability measurement among different implementations. Otherwise the interoperability will be extremely limited due to the fact that implementers will choose arbitrary values to identify the new metrics.

When the draft is considered mature, that is when all the metrics are defined and when their names are chosen:

The authors will insert a registry in the section 'Standard metrics registry' of their document. A registry template is proposed above.

The chairs of the IPPM WG provide metrics identifiers from the rfc(1) node of the registry.

4.4. Identification of metric from other organization

Metrics defined by other organization may be registered in the node other(2).

5. Initial IPPM registry

IPPM-METRICS-REGISTRY DEFINITIONS ::= BEGIN

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IMPORTS

```
OBJECT-IDENTITY,
experimental,
MODULE-IDENTITY
    FROM SNMPv2-SMI;
```

ippmMetricsRegistry MODULE-IDENTITY

```
LAST-UPDATED "200303011100Z"    -- March 1st, 2003
ORGANIZATION "IPPM working Group"
CONTACT-INFO "ippm@advanced.org"
DESCRIPTION
```

Base

```
" This memo defines a portion of the Management Information
```

based

```
(MIB) for use with network management protocols in TCP/IP-
```

```
internets. In particular, it defines a registry of the IPPM
working group metrics."
```

```
REVISION    "200303011100Z"
```

```
DESCRIPTION
```

```
"Registration rules simplified: see section change since 01."
```

```
REVISION    "200206241100Z"
```

```
DESCRIPTION
```

```
"Each metric identifier is defined in a OBJECT IDENTITY
```

macro."

```
::= { experimental 10002 }
```

```
rfc          OBJECT IDENTIFIER      ::= { ippmMetricsRegistry 1 }
```

```
other        OBJECT IDENTIFIER      ::= { ippmMetricsRegistry 2 }
```

```
--
```

```
-- Registry of the metrics of the IPPM WG RFCs
```

```
--
```

```
--
```

```
-- RFC 2678 " IPPM Metrics for Measuring Connectivity"
```

```
--
```

instantUnidirectionConnectivity OBJECT-IDENTITY

```
STATUS current
```

```
DESCRIPTION
```

```
"The identifier for the Type-P-Instantaneous-Unidirectional-
Connectivity metric."
```

```
REFERENCE "RFC2678, section 2."
```

```
::={rfc 1}
```

instantBidirectionConnectivity OBJECT-IDENTITY

```
STATUS current
```

```
DESCRIPTION
```

"The identifier for the Type-P-Instantaneous-Bidirectional-Connectivity metric."

REFERENCE "[RFC2678, section 3](#)."

::={[rfc 2](#)}

intervalUnidirectionConnectivity OBJECT-IDENTITY

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```
STATUS current
DESCRIPTION
"The identifier for the Type-P-Interval-Unidirectional-
Connectivity metric."
REFERENCE "RFC2678, section 4."
::= { rfc 3 }
```

```
intervalBidirectionConnectivity OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Interval-Bidirectional-
Connectivity metric."
REFERENCE "RFC2678, section 5."
::= { rfc 4 }
```

```
intervalTemporalConnectivity OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P1-P2-Interval-Temporal-
Connectivity metric. "
REFERENCE "RFC2678, section 6."
::= { rfc 5 }
```

```
--
-- RFC 2679 "A One-way Delay Metric for IPPM"
--
```

```
oneWayDelay OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Delay metric. "
REFERENCE "RFC2679, section 3."
::= { rfc 6 }
```

```
oneWayDelayPoissonStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Delay-Poisson-Stream
metric. "
REFERENCE "RFC2679, section 4"
::= { rfc 7 }
```

```
oneWayDelayPercentile OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Delay-Percentile
metric."
REFERENCE "RFC2679, section 5.1."
```

::= { rfc 8 }

oneWayDelayMedian OBJECT-IDENTITY
STATUS current

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```
DESCRIPTION
"The identifier for the Type-P-One-way-Delay-Median metric."
REFERENCE "RFC2679, section 5.2."
      ::= { rfc 9 }

oneWayDelayMinimum OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Delay-Minimum metric."
"
      REFERENCE "RFC2679, section 5.3."
      ::= { rfc 10 }

oneWayDelayInversePercentile OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Delay-Inverse-
Percentile
metric. "
      REFERENCE "RFC2679, section 5.4."
      ::= { rfc 11 }

--
-- RFC 2680 "One Way Packet Loss Metric for IPPM"
--

oneWayPacketLoss OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Packet-Loss metric."
REFERENCE "RFC2680, section 2."
      ::= { rfc 12 }

oneWayPacketLossPoissonStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Packet-Loss-Poisson-
Stream metric."
REFERENCE "RFC2680, section 3."
      ::= { rfc 13 }

oneWayPacketLossAverage OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-way-Packet-Loss-Average
metric."
REFERENCE "RFC2680, section 4."
      ::= { rfc 14 }
```

--
-- [RFC2681](#) "A Round-trip Delay Metric for IPPM"
--

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roundtripDelay OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Delay metric."
REFERENCE " [section 2](#) of the [rfc2681](#)."
::= { [rfc 15](#) }

Stream
roundtripDelayPoissonStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Delay-Poisson-
metric."
REFERENCE "[RFC2681, section 4](#)."
::= { [rfc 16](#) }

roundtripDelayPercentile OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Delay-Percentile
metric."
REFERENCE "[RFC2681, section 4.1](#)."
::= { [rfc 17](#) }

metric."
roundtripDelayMedian OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Delay-Median
metric."
REFERENCE "[RFC2681, section 4.2](#)."
::= { [rfc 18](#) }

metric."
roundtripDelayMinimum OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Delay-Minimum
metric."
REFERENCE "[RFC2681, section 4.3](#)."
::= { [rfc 19](#) }

roundtripDelayInversePercentile OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-Round-trip-Inverse-Percentile
metric."
REFERENCE "[RFC2681, section 4.4](#)."
::= { [rfc 20](#) }

--
-- [RFC3357](#): "One-way Loss Pattern Sample Metrics"
--

oneWayLossDistanceStream OBJECT-IDENTITY
STATUS current

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```
DESCRIPTION
"The identifier for the Type-P-One-Way-Loss-Distance-Stream
metric."
REFERENCE " RFC3357, section 5.4.1."
::={ rfc 21}

oneWayLossPeriodStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-Way-Loss-Period-Stream
metric."
REFERENCE " RFC3357, section 5.4.2."
::={ rfc 22}

oneWayLossNoticeableRate OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-Way-Loss-Noticeable-Rate
metric."
REFERENCE " RFC3357, section 6.1."
::= { rfc 23 }

oneWayLossPeriodTotal OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-Way-Loss-Period-Total
metric."
REFERENCE " RFC3357, section 6.2."
::= { rfc 24 }

oneWayLossPeriodLengths OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-Way-Loss-Period-Lengths
metric."
REFERENCE " RFC3357, section 6.3."
::= { rfc 25 }

oneWayInterLossPeriodLengths OBJECT-IDENTITY
STATUS current
DESCRIPTION
"The identifier for the Type-P-One-Way-Inter-Loss-Period-
Lengths
metric."
REFERENCE " RFC3357, section 6.4."
::= { rfc 26 }
```

--
-- [RFC3393](#): "IP Packet Delay Variation Metric for IP Performance
Metrics (IPPM)"
--

oneWayIpdv OBJECT-IDENTITY

STATUS current

DESCRIPTION

"The identifier for the Type-P-One-way-ipdv metric."

REFERENCE " [RFC3393, section 2.](#)"::= { [rfc 27](#) }

oneWayIpdvPoissonStream OBJECT-IDENTITY

STATUS current

DESCRIPTION

metric." "The identifier for the Type-P-One-way-ipdv-Poisson-stream

REFERENCE " [RFC3393, section 3.](#)"::= { [rfc 28](#) }

oneWayIpdvPercentile OBJECT-IDENTITY

STATUS current

DESCRIPTION

metric." "The identifier for the Type-P-One-way-ipdv-percentile

REFERENCE " [RFC3393, section 4.3.](#)"::= { [rfc 29](#) }

oneWayIpdvInversePercentile OBJECT-IDENTITY

STATUS current

DESCRIPTION

percentile "The identifier for the Type-P-One-way-ipdv-inverse-

metric."

REFERENCE " [RFC3393, section 4.4.](#)"::= { [rfc 30](#) }

oneWayIpdvJitter OBJECT-IDENTITY

STATUS current

DESCRIPTION

"The identifier for the Type-P-One-way-ipdv-jitter metric."

REFERENCE " [RFC3393, section 4.5.](#)"::= { [rfc 31](#) }

oneWayPeakToPeakIpdv OBJECT-IDENTITY

STATUS current

DESCRIPTION

metric." "The identifier for the Type-P-One-way-peak-to-peak-ipdv

REFERENCE " [RFC3393, section 4.6.](#)"::= { [rfc 32](#) }

--
-- [RFC3432](#): "Network performance measurement with periodic streams"
--

```
oneWayDelayPeriodicStream OBJECT-IDENTITY
    STATUS current
    DESCRIPTION
        "The identifier for the Type-P-One-way-Delay-Periodic-Stream
metric."
    REFERENCE " RFC3432, section 4."
        ::= { rfc 33 }

END
```

6. Change since release 00

Macro OBJECT-IDENTITY used to identify the metrics

7. Change since release 01

- + Registrations rules simplified;
- + Draft sub tree removed;
- + Loss pattern metrics of the [RFC3357](#) added to the registry.
- + ipv6 metrics of the [RFC3393](#) added to the registry.
- + Periodic streams metrics of the [RFC3432](#) added to the registry.

56th IETF open issues:

- should metrics OID be 8 bytes length ? Y/N
- should be ::= { ippm 1 }
- with ippm OBJECT IDENTIFIER ::= { mgmt xxx }
- to have metrics OID to be 8 bytes length.
- 1.3.6.1.2.ippm.ippmMetricRegistry.rfc.oneWayDelay

8. References

- [1] Bradner, S., "The Internet Standards Process -- Revision 3", [BCP 9](#), [RFC 2026](#), October 1996.
- [2] Mahdavi J. and V. Paxson, "IPPM Metrics for Measuring Connectivity", [RFC 2678](#), September 1999.
- [3] Almes, G., Kalidindi, S. and M. Zekauskas, "A One-way Delay Metric for IPPM", [RFC 2679](#), September 1999.

- [4] Almes, G., Kalidindi, S. and M. Zekauskas, "A One-way Packet Loss Metric for IPPM", [RFC 2680](#), September 1999.
- [5] Almes, G., Kalidindi, S. and M. Zekauskas, "A Round-trip Delay Metric for IPPM.", [RFC 2681](#), September 1999.

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