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IP Performance Metrics (IPPM) metrics registry
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Abstract

This memo defines a registry for IP Performance Metrics (IPPM). It assigns and registers an initial set of OBJECT IDENTITIES to currently defined metrics in the IETF.

This memo also defines the rules for adding new IP Performance Metrics that are defined in the future and for encouraging all IP performance metrics to be registered here.

IANA has been assigned to administer this new registry.

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1. 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 \[RFC2580\]](#).

2. Overview

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

- o to permit metrics to be clearly referenced by MIB modules or other data models;
- o Metrics identifiers are needed to allow measurement interoperability;
- o As specification of new metrics is a continuous process, special care must be taken for the integration of future standardized metrics;
- o Since the intent of the IPPM WG is to cooperate with other appropriate standards bodies (or fora) to promote consistent metrics, room where other standards bodies can register their metrics is provided to encourage IP performance metrics to have OBJECT IDENTITIES rooted at a common point;
- o Similarly, room is provided for enterprises to register metrics.

3. IP Performance Metrics Registry Framework

MIB modules need to be able to precisely reference IPPM Metrics. The registry associates an OBJECT-IDENTITY with each metric. As an example Type-P-One-way-Delay and Type-P-One-way-Delay-Poisson-Stream have different OBJECT IDENTITIES.

The registry has one branch. Metrics are identified in 'ianaIppmMetrics' subtree.

This document defines an initial registry of the existing metrics

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defined in the IPPM WG and the rules to manage the registry.

Documents defining metrics in the future will include in the IANA section the registration information to unambiguously identify these metrics.

4. Initial IPPM Metrics Registry Creation

The initial registry identifies the metrics currently defined in the RFCs produced in the IPPM WG. To date, the IPPM WG defined 33 metrics related to 7 topics:

- o IPPM Metrics for Measuring Connectivity, [RFC 2678](#) [[RFC2678](#)];
- o One-way Delay Metrics, [RFC 2679](#) [[RFC2679](#)];
- o One-way Packet Loss Metrics, [RFC 2680](#) [[RFC2680](#)];
- o Round-trip Delay Metrics, [RFC 2681](#) [[RFC2681](#)];
- o One-way Loss Pattern Sample Metrics, [RFC 3357](#) [[RFC3357](#)];
- o IP Packet Delay Variation Metric, [RFC 3393](#) [[RFC3393](#)];
- o IPPM Metrics for periodic streams, [RFC 3432](#) [[RFC3432](#)];

They are sequentially registered in the node ianaIppmMetrics.

The naming conventions used for the existing metrics, and encouraged for new IPPM metrics, are :

- o Metrics names conform SMIV2 rules for descriptors defined in the [section 3.1 of \[RFC2578\]](#);
- o The name starts with the prefix 'ietf';
- o 'Type-P' prefix is removed;
- o '-' are removed;
- o The letter following a '-' is changed to upper case.

[5.](#) IANA Considerations

This section describes the rules for the management of the registry by IANA.

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[5.1](#) Management rules

Registrations are done sequentially by IANA in the `ianaIppmMetrics` subtree on the bases of 'Specification Required' as defined in [\[RFC2434\]](#).

The reference of the specification must point to a stable document including a title, a revision and a date.

The name always starts with the name of the organization and must respect the SMIV2 rules for descriptors defined in the [section 3.1 of \[RFC2578\]](#);

A document that creates new metrics would have an IANA considerations section in which it would describe new metrics to register.

An OBJECT IDENTITY assigned to a metric is definitive and cannot be reused. If a new version of a metric is produced then it is assigned with a new name and a new identifier.

[5.2](#) Registration template

Following is a proposed template to insert in the IANA considerations section. For each metric, that section would instantiate the following statement:

IANA has registered the following metric in the IANA-IPPM-METRICS-REGISTRY-MIB:

```
aNewMetricName OBJECT-IDENTITY
STATUS          current
DESCRIPTION
    "The identifier for a new metric."
REFERENCE
    "Reference R, section n."
    ::= { ianaIppmMetrics nn }      -- IANA assigns nn
```

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[6.](#) Initial IPPM registry definition

```
IANA-IPPM-METRICS-REGISTRY-MIB DEFINITIONS ::= BEGIN

IMPORTS
    OBJECT-IDENTITY, MODULE-IDENTITY, mib-2
    FROM SNMPv2-SMI;

ianaIppmMetricsRegistry MODULE-IDENTITY
    LAST-UPDATED "200411300000Z"      -- November 30th, 2004
    ORGANIZATION "IANA"
    CONTACT-INFO "Internet Assigned Numbers Authority
```

Postal: ICANN
4676 Admiralty Way, Suite 330
Marina del Rey, CA 90292

Tel: +1 310 823 9358
E-Mail: iana@iana.org"

DESCRIPTION

"This module defines a registry for IP Performance Metrics.

Registrations are done sequentially by IANA in the `ianaIppmMetrics` subtree on the bases of 'Specification Required' as defined in [\[RFC2434\]](#).

The reference of the specification must point to a stable document including a title, a revision and a date.

The name always starts with the name of the organization and must respect the SMIV2 rules for descriptors defined in the [section 3.1 of \[RFC2578\]](#);

A document that creates new metrics would have an IANA considerations section in which it would describe new metrics to register.

An OBJECT IDENTITY assigned to a metric is definitive and cannot be reused. If a new version of a metric is produced then it is assigned with a new name and a new identifier.

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<http://www.ietf.org/copyrights/ianamib.html>. "

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

REVISION "200411300000Z" -- November 30th, 2004

DESCRIPTION

"Initial version of the IPPM metrics registry module.
This version published as RFC yyyy."

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

ianaIppmMetrics OBJECT-IDENTITY
    STATUS          current
    DESCRIPTION
        "Registration point for IP Performance Metrics."
    ::= { ianaIppmMetricsRegistry 1 }

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



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

ietfInstantUnidirConnectivity OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-Instantaneous-Unidirectional-Connectivity"
    REFERENCE "RFC2678, section 2."
    ::= { ianaIppmMetrics 1}

ietfInstantBidirConnectivity OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-Instantaneous-Bidirectional-Connectivity"
    REFERENCE "RFC2678, section 3."
    ::= { ianaIppmMetrics 2}

ietfIntervalUnidirConnectivity OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-Interval-Unidirectional-Connectivity"
    REFERENCE "RFC2678, section 4."
    ::= { ianaIppmMetrics 3 }

ietfIntervalBidirConnectivity OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-Interval-Bidirectional-Connectivity"
    REFERENCE "RFC2678, section 5."
    ::= { ianaIppmMetrics 4 }

ietfIntervalTemporalConnectivity OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P1-P2-Interval-Temporal-Connectivity"
    REFERENCE "RFC2678, section 6."
    ::= { ianaIppmMetrics 5 }

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

ietfOneWayDelay OBJECT-IDENTITY
    STATUS      current
```

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```
DESCRIPTION
    "Type-P-One-way-Delay"
REFERENCE "RFC2679, section 3."
::= { ianaIppmMetrics 6 }

ietfOneWayDelayPoissonStream OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Poisson-Stream"
REFERENCE "RFC2679, section 4."
::= { ianaIppmMetrics 7 }

ietfOneWayDelayPercentile OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Percentile"
REFERENCE "RFC2679, section 5.1."
::= { ianaIppmMetrics 8 }

ietfOneWayDelayMedian OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Median"
REFERENCE "RFC2679, section 5.2."
::= { ianaIppmMetrics 9 }

ietfOneWayDelayMinimum OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Minimum"
REFERENCE "RFC2679, section 5.3."
::= { ianaIppmMetrics 10 }

ietfOneWayDelayInversePercentile OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Inverse-Percentile"
REFERENCE "RFC2679, section 5.4."
::= { ianaIppmMetrics 11 }
```

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-- [RFC 2680](#) "One Way Packet Loss Metric for IPPM"

--

ietfOneWayPktLoss OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Packet-Loss"

REFERENCE "[RFC2680, section 2.](#)"

::= { ianaIppmMetrics 12 }

ietfOneWayPktLossPoissonStream OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Packet-Loss-Poisson-Stream"

REFERENCE "[RFC2680, section 3.](#)"

::= { ianaIppmMetrics 13 }

ietfOneWayPktLossAverage OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Packet-Loss-Average"

REFERENCE "[RFC2680, section 4.](#)"

::= { ianaIppmMetrics 14 }

--

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

--

ietfRoundTripDelay OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-Round-trip-Delay"

REFERENCE " [section 2](#) of the [rfc2681](#)."
 ::= { ianaIppmMetrics 15 }

ietfRoundTripDelayPoissonStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
 "Type-P-Round-trip-Delay-Poisson-Stream"
REFERENCE "[RFC2681, section 4](#)."
 ::= { ianaIppmMetrics 16 }

ietfRoundTripDelayPercentile OBJECT-IDENTITY
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DESCRIPTION
 "Type-P-Round-trip-Delay-Percentile"
REFERENCE "[RFC2681, section 4.1](#)."
 ::= { ianaIppmMetrics 17 }

ietfRoundTripDelayMedian OBJECT-IDENTITY
STATUS current
DESCRIPTION
 "Type-P-Round-trip-Delay-Median"
REFERENCE "[RFC2681, section 4.2](#)."
 ::= { ianaIppmMetrics 18 }

ietfRoundTripDelayMinimum OBJECT-IDENTITY
STATUS current
DESCRIPTION
 "Type-P-Round-trip-Delay-Minimum"
REFERENCE "[RFC2681, section 4.3](#)."
 ::= { ianaIppmMetrics 19 }

ietfRoundTripDelayInvPercentile OBJECT-IDENTITY
STATUS current
DESCRIPTION
 "Type-P-Round-trip-Inverse-Percentile"
REFERENCE "[RFC2681, section 4.4](#)."
 ::= { ianaIppmMetrics 20 }

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

ietfOneWayLossDistanceStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"Type-P-One-Way-Loss-Distance-Stream"
REFERENCE " [RFC3357, section 5.4.1.](#)"
::={ ianaIppmMetrics 21}

ietfOneWayLossPeriodStream OBJECT-IDENTITY
STATUS current
DESCRIPTION
"Type-P-One-Way-Loss-Period-Stream"
REFERENCE " [RFC3357, section 5.4.2.](#)"
::={ ianaIppmMetrics 22}

ietfOneWayLossNoticeableRate OBJECT-IDENTITY

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STATUS current
DESCRIPTION
"Type-P-One-Way-Loss-Noticeable-Rate"
REFERENCE " [RFC3357, section 6.1.](#)"
::= { ianaIppmMetrics 23 }

ietfOneWayLossPeriodTotal OBJECT-IDENTITY
STATUS current
DESCRIPTION
"Type-P-One-Way-Loss-Period-Total"
REFERENCE " [RFC3357, section 6.2.](#)"
::= { ianaIppmMetrics 24 }

ietfOneWayLossPeriodLengths OBJECT-IDENTITY
STATUS current
DESCRIPTION
"Type-P-One-Way-Loss-Period-Lengths"
REFERENCE " [RFC3357, section 6.3.](#)"
::= { ianaIppmMetrics 25 }

ietfOneWayInterLossPeriodLengths OBJECT-IDENTITY
STATUS current

DESCRIPTION
 >Type-P-One-Way-Inter-Loss-Period-Lengths"
REFERENCE " [RFC3357, section 6.4.](#)"
::= { ianaIppmMetrics 26 }

--

-- [RFC3393](#):

-- IP Packet Delay Variation Metric for IP Performance Metrics (IPPM)

ietfOneWayIpdv OBJECT-IDENTITY
 STATUS current
 DESCRIPTION
 >Type-P-One-way-ipdv"
 REFERENCE " [RFC3393, section 2.](#)"
 ::= { ianaIppmMetrics 27 }

ietfOneWayIpdvPoissonStream OBJECT-IDENTITY
 STATUS current
 DESCRIPTION
 >Type-P-One-way-ipdv-Poisson-stream"
 REFERENCE " [RFC3393, section 3.](#)"
 ::= { ianaIppmMetrics 28 }

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ietfOneWayIpdvPercentile OBJECT-IDENTITY
 STATUS current
 DESCRIPTION
 >Type-P-One-way-ipdv-percentile"
 REFERENCE " [RFC3393, section 4.3.](#)"
 ::= { ianaIppmMetrics 29 }

ietfOneWayIpdvInversePercentile OBJECT-IDENTITY
 STATUS current
 DESCRIPTION
 >Type-P-One-way-ipdv-inverse-percentile"
 REFERENCE " [RFC3393, section 4.4.](#)"
 ::= { ianaIppmMetrics 30 }

ietfOneWayIpdvJitter OBJECT-IDENTITY

```

STATUS      current
DESCRIPTION
    "Type-P-One-way-ipdv-jitter"
REFERENCE " RFC3393, section 4.5."
::= { ianaIppmMetrics 31 }

ietfOneWayPeakToPeakIpdv OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-peak-to-peak-ipdv"
REFERENCE " RFC3393, section 4.6."
::= { ianaIppmMetrics 32 }

--
-- RFC3432: "Network performance measurement with periodic streams"
--

ietfOneWayDelayPeriodicStream OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-way-Delay-Periodic-Stream"
REFERENCE " RFC3432, section 4."
::= { ianaIppmMetrics 33 }

END

```

[7.](#) Security Considerations

This module does not define any management objects. Instead, it assigns a set of OBJECT-IDENTITIES which may be used by other MIB modules to identify specific IP Performance Metrics.

Meaningful security considerations can only be written in the MIB modules that define management objects. This document has therefore

no impact on the security of the Internet.

[8.](#) References

[8.1](#) Normative References

- [RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 2434](#), October 1998.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2678] Mahdavi, J. and V. Paxson, "IPPM Metrics for Measuring Connectivity", [RFC 2678](#), September 1999.
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- [RFC2680] Almes, G., Kalidindi, S. and M. Zekauskas, "A One-way Packet Loss Metric for IPPM", [RFC 2680](#), September 1999.
- [RFC2681] Almes, G., Kalidindi, S. and M. Zekauskas, "A Round-trip Delay Metric for IPPM", [RFC 2681](#), September 1999.
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- [RFC3432] Raisanen, V., Grotefeld, G. and A. Morton, "Network performance measurement with periodic streams", [RFC 3432](#), November 2002.

[8.2](#) Informative References

- [RFC2330] Paxson, V., Almes, G., Mahdavi, J. and M. Mathis, "Framework for IP Performance Metrics", [RFC 2330](#), May 1998.
- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "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.
- [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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