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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. There are branches for other standards bodies and enterprises defined to encourage 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; 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, a branch 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, a branch is provided for registered 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 3 main branches. The origin of the document defining the metrics determines the node which branch the metric is identified in:

- o Metrics defined by IETF are identified in the

'ianaIppmIetfMetrics' tree;

- o Metrics defined in cooperation with standards bodies or fora may be identified in the 'ianaIppmForaMetrics' tree.
- o Vendors may register private metrics in the 'ianaIppmEnterprisesMetrics' tree.

This document defines an initial registry of the existing metrics 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](#)];

5. IANA Considerations

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

5.1 Management rules

Registrations are done by IANA 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.

5.1.1 Naming Conventions

The name of the metric in the registry must respect the SMIV2 rules for descriptors defined in the [section 3.1 of \[RFC2578\]](#):

- o Descriptors longer than 32 characters are not recommended;
- o Initial character must be a lower-case letter;
- o Hyphens are not allowed;

The following rules are applied to allocate the name and the identifier of a metric:

- o The name always starts with the name of the organization;
- o OBJECT IDENTITIES for metrics are sequentially numbered by IANA;
- o A OBJECT IDENTITY assigned to a metric is definitive and cannot be reused;
- o If a new version of a metric is produced then it is assigned with a new name and a new identifier.

5.1.2 Metrics Defined by IETF

Such metrics are registered in the node `ianaIppmIetfMetrics(1)`. The guidelines used for the existing metrics, and encouraged for new metrics, are

- o The name always starts with the prefix 'ietf'.
- o 'Type-P' prefix is removed.
- o '-' are removed;

- o The letter following a '-' is changed to upper case;

5.1.3 Metrics Defined in Cooperation with Standards bodies or Fora

IANA already assigns enterprises with unambiguous identifiers named enterprise numbers or vendorID. See <http://www.iana.org/numbers.html>.

- o An organisation without an enterprise number should apply for one;

- o IANA registers the metrics of an organisation under the branch `ianaIppmForaMetrics(2)`, in the subtree corresponding to its enterprise number.
- o The name of the metric always starts with (an abbreviation of) the name of the organization.

For example, if the organisation ForumA has been assigned { enterprises 696 }, it will register its metrics in the subtree `ianaIppmMetricsRegistry(x).ianaIppmForaMetrics(2).696`. The name of a metric starts with the prefix 'ForumA'.

Nothing prevents these bodies from registering metrics in their own OBJECT IDENTIFIER trees.

5.1.4 Enterprise Metrics Registration

IANA already assigns enterprises with unambiguous identifiers named enterprise numbers or vendorID. See <http://www.iana.org/numbers.html>.

- o An enterprise without an enterprise number should apply for one;
- o IANA registers the metrics of an enterprise under the branch `ianaIppmEnterprisesMetrics(3)`, in the subtree corresponding to its enterprise number.
- o The name of the metric always starts with (an abbreviation of) the name of the company.

For example, if Acme Networks has been assigned { enterprises 696 }, it will register its metrics in the subtree `ianaIppmMetricsRegistry(x).ianaIppmEnterprisesMetrics(3).696`. The name of a metric starts with the prefix 'Acme'.

5.2 Registration templates

A document that creates new Metrics would have an IANA considerations

section in which it would describe new metrics to register.

[5.2.1](#) IETF RFCs

For each metric, that section would have a statement aka:

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

```
ietfSomeNewMetricName OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION "The identifier for the Type-P-Some-New_Metric-Name
        metric."
    REFERENCE   "RFCxxxx, section n." -- RFC-Editor fills in xxxx
    ::= { ianaIppmIetfMetrics nn }    -- IANA assigns nn
```

[5.2.2](#) Standards bodies and Fora

For each metric, that section would have a statement aka:

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

```
foraNameSomeNewMetricName OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION "The identifier for the Some-New_Metric-Name
        metric."
    REFERENCE   "Specification title/revision/date, section n."
    ::= { foraEnterpriseNumber nn }    -- IANA assigns nn
```

[5.2.3](#) Enterprises

For each metric, that section would have a statement aka:

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

```
vendorNameSomeNewMetricName OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION "The identifier for the Some-New_Metric-Name
        metric."
    REFERENCE   "Specification title/revision/date, section n."
    ::= { vendorEnterpriseNumber 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 "200406280000Z" -- June 28th, 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 (IPPM) Metrics.

The registry is administred by IANA.

Following are the main rules for managing the registry:

- * Registrations are done by IANA on the bases of 'Specification Required' as defined in [[RFC2434](#)];
- * Metrics names must comform SMIV2 rules for descriptors defined in the [section 3.1 of \[RFC2578\]](#);
- * Metrics defined by IETF are registered by IANA in the ianaIppmIetfMetrics subtree;

- * Metrics defined by a standards bodies are registred by IANA under the node corresponding to the entreprise number of this organisation in the ianaIppmForaMetrics subtree;
- * Metrics defined by an enterprise are registred by IANA under the node corresponding to the entreprise number of this company in the ianaIppmEnterprisesMetrics subtree;

The rules are fully described in the 'IANA considerations' section.

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

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

REVISION "200406280000Z" -- June 28th, 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

ianaIppmIetfMetrics OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Registration point for IP Performance (IPPM) Metrics
defined by the IETF."

::= { ianaIppmMetricsRegistry 1 }

ianaIppmForaMetrics OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Registration point for IP Performance Metrics
defined by other (i.e., non-IETF) organizations."

::= { ianaIppmMetricsRegistry 2 }

ianaIppmEnterprisesMetrics OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Registration point for IP Performance Metrics
defined by enterprises or vendors."

::= { ianaIppmMetricsRegistry 3 }

--

-- Registry of the metrics of the IPPM WG RFCs

--

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

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

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

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

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

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

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

```
ietfOneWayDelay OBJECT-IDENTITY  
    STATUS      current
```

DESCRIPTION

"Type-P-One-way-Delay"

REFERENCE "[RFC2679, section 3.](#)"

::= { ianaIppmIetfMetrics 6 }

ietfOneWayDelayPoissonStream OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Delay-Poisson-Stream"

REFERENCE "[RFC2679, section 4.](#)"

::= { ianaIppmIetfMetrics 7 }

ietfOneWayDelayPercentile OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Delay-Percentile"

REFERENCE "[RFC2679, section 5.1.](#)"

::= { ianaIppmIetfMetrics 8 }

ietfOneWayDelayMedian OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Delay-Median"

REFERENCE "[RFC2679, section 5.2.](#)"

::= { ianaIppmIetfMetrics 9 }

ietfOneWayDelayMinimum OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Delay-Minimum"

REFERENCE "[RFC2679, section 5.3.](#)"

::= { ianaIppmIetfMetrics 10 }

ietfOneWayDelayInversePercentile OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-way-Delay-Inverse-Percentile"

REFERENCE "[RFC2679, section 5.4.](#)"

::= { ianaIppmIetfMetrics 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."  
    ::= { ianaIppmIetfMetrics 12 }
```

```
ietfOneWayPktLossPoissonStream OBJECT-IDENTITY  
    STATUS      current  
    DESCRIPTION  
        "Type-P-One-way-Packet-Loss-Poisson-Stream"  
    REFERENCE "RFC2680, section 3."  
    ::= { ianaIppmIetfMetrics 13 }
```

```
ietfOneWayPktLossAverage OBJECT-IDENTITY  
    STATUS      current  
    DESCRIPTION  
        "Type-P-One-way-Packet-Loss-Average"  
    REFERENCE "RFC2680, section 4."  
    ::= { ianaIppmIetfMetrics 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."  
    ::= { ianaIppmIetfMetrics 15 }
```

```
ietfRoundTripDelayPoissonStream OBJECT-IDENTITY  
    STATUS      current  
    DESCRIPTION
```

```
"Type-P-Round-trip-Delay-Poisson-Stream"  
REFERENCE "RFC2681, section 4."  
::= { ianaIppmIetfMetrics 16 }
```

```
ietfRoundTripDelayPercentile OBJECT-IDENTITY  
STATUS      current
```

DESCRIPTION

"Type-P-Round-trip-Delay-Percentile"

REFERENCE "[RFC2681, section 4.1.](#)"

::= { ianaIppmIetfMetrics 17 }

ietfRoundTripDelayMedian OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-Round-trip-Delay-Median"

REFERENCE "[RFC2681, section 4.2.](#)"

::= { ianaIppmIetfMetrics 18 }

ietfRoundTripDelayMinimum OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-Round-trip-Delay-Minimum"

REFERENCE "[RFC2681, section 4.3.](#)"

::= { ianaIppmIetfMetrics 19 }

ietfRoundTripDelayInvPercentile OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-Round-trip-Inverse-Percentile"

REFERENCE "[RFC2681, section 4.4.](#)"

::= { ianaIppmIetfMetrics 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.](#)"

::={ ianaIppmIetfMetrics 21}

ietfOneWayLossPeriodStream OBJECT-IDENTITY

STATUS current

DESCRIPTION

"Type-P-One-Way-Loss-Period-Stream"

REFERENCE " [RFC3357, section 5.4.2.](#)"

::={ ianaIppmIetfMetrics 22}

ietfOneWayLossNoticeableRate OBJECT-IDENTITY

```
STATUS      current
DESCRIPTION
    "Type-P-One-Way-Loss-Noticeable-Rate"
REFERENCE " RFC3357, section 6.1."
::= { ianaIppmIetfMetrics 23 }

ietfOneWayLossPeriodTotal OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-Way-Loss-Period-Total"
REFERENCE " RFC3357, section 6.2."
::= { ianaIppmIetfMetrics 24 }

ietfOneWayLossPeriodLengths OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-Way-Loss-Period-Lengths"
REFERENCE " RFC3357, section 6.3."
::= { ianaIppmIetfMetrics 25 }

ietfOneWayInterLossPeriodLengths OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "Type-P-One-Way-Inter-Loss-Period-Lengths"
REFERENCE " RFC3357, section 6.4."
::= { ianaIppmIetfMetrics 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."
::= { ianaIppmIetfMetrics 27 }

ietfOneWayIpdvPoissonStream OBJECT-IDENTITY
```

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

```
ietfOneWayIpdvPercentile OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-One-way-ipdv-percentile"
    REFERENCE " RFC3393, section 4.3."
    ::= { ianaIppmIetfMetrics 29 }
```

```
ietfOneWayIpdvInversePercentile OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-One-way-ipdv-inverse-percentile"
    REFERENCE " RFC3393, section 4.4."
    ::= { ianaIppmIetfMetrics 30 }
```

```
ietfOneWayIpdvJitter OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-One-way-ipdv-jitter"
    REFERENCE " RFC3393, section 4.5."
    ::= { ianaIppmIetfMetrics 31 }
```

```
ietfOneWayPeakToPeakIpdv OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Type-P-One-way-peak-to-peak-ipdv"
    REFERENCE " RFC3393, section 4.6."
    ::= { ianaIppmIetfMetrics 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."
    ::= { ianaIppmIetfMetrics 33 }
```

END

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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

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