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IP Performance Metrics (IPPM) metrics registry
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Status of this Memo

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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:

- to permit metrics to be clearly referenced by MIB modules or other data models;
- 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;
- 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;
- 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;

- Metrics defined in cooperation with standards bodies or fora may be identified in the 'ianaIppmForaMetrics' tree.

- 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:

- IPPM Metrics for Measuring Connectivity, RFC 2678 [RFC2678];

- One-way Delay Metrics, RFC 2679 [RFC2679];

- One-way Packet Loss Metrics, RFC 2680 [RFC2680];

- Round-trip Delay Metrics, RFC 2681 [RFC2681];

- One-way Loss Pattern Sample Metrics, RFC 3357 [RFC3357];

- IP Packet Delay Variation Metric, RFC 3393 [RFC3393];

- 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]:

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

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

- The name always starts with the name of the organization;
- OBJECT IDENTITIES for metrics are sequentially numbered by IANA;
- A 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.

5.1.2 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

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

- 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.

- An organisation without an entreprise number should apply for one;

- IANA registers the metrics of an organisation under the branch ianaIppmForaMetrics(2), in the subtree corresponding to its enterprise number.

- 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 INDENTIFIER trees.

5.1.4 Entreprise Metrics Registration

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

- An enterprise without an entreprise number should apply for one;

- IANA registers the metrics of an enterprise under the branch ianaIppmEnterprisesMetrics(3), in the subtree corresponding to its enterprise number.

- 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 registed 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 registed 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 registed 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
```

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 registed by IANA in the
      ianaIppmIetfMetrics subtree;
```

* Metrics defined by a standards bodies are registed by IANA under the node corresponding to the entreprise number of this organisation in the ianaIppmForaMetrics subtree;

* Metrics defined by an enterprise are registed 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.

-- 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
  --
```

```
  --
  -- 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 }
```

```
   --
   -- 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
```

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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