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Performance Metrics Registry
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Abstract

This document specifies an IANA registry for Performance Metrics.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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Table of Contents

1. Introduction 2
1.1. Terminology 3
2. Guidelines for considering New Performance Metric Development 3
2.1. Performance Metric Template Definition 4
2.2. Performance Metric Directorate 4
3. Performance Metrics in the IPFIX Registry 5
4. Initial Set of Performance Metrics 5
5. Security Considerations 7
6. IANA Considerations 7
7. Acknowledgments 8
8. References 8
8.1. Normative References 8
8.2. Informative References 9
Authors' Addresses 10

1. Introduction

The IETF has been specifying and continues to specify Performance Metrics. While IP Performance Metris (IPPM) is the working group (WG) primarily focusing on Peformance Metrics definition at the IETF, other working groups, have also specified Peformance Metrics. The "Metric Blocks for use with RTCP's Extended Report Framework" [XRBLOCK] WG recently specified many Peformance Metrics related to "RTP Control Protocol Extended Reports (RTCP XR)" [RFC3611], which establishes a framework to allow new information to be conveyed in RTCP, supplementing the original report blocks defined in "RTP: A Transport Protocol for Real-Time Applications", [RFC3550]. The Benchmarking Methodology" [BMWG] WG proposed some Peformance Metrics part of the benchmarking methodology. The IP Flow Information eXport WG (IPFIX) [IPFIX] Information elements related to performance metrics are currently proposed. The Performance Metrics for Other Layers (PMOL) [PMOL], a concluded working group, defined some Peformance Metrics related to Session Initiation Protocol (SIP) voice quality [RFC6035]. It is expected that more and more Peformance Metrics will be defined in the future, not only IP based metrics, but also protocol-specific ones and application-specific ones.

However, there is currently no Peformance Metrics registry in IANA. This creates a real problem for the industry: first to discover which performance metrics have already specified, second to avoid Peformance Metrics redefinition. Only someone with a broad IETF

knowledge would be able to find its way among all the different Peformance Metrics specified in the different WGs.

The IPPM Metrics Registry (RFC4148) was an attempt to create such a Peformance Metrics registry. However, that registry was reclassified

as obsolete with [RFC6248], "RFC 4148 and the IP Performance Metrics (IPPM) Registry of Metrics Are Obsolete", and consequently withdrawn.

A couple of interesting quotes from RFC 4148 might help understand the issues related to that registry.

1. "It is not believed to be feasible or even useful to register every possible combination of Type P, metric parameters, and Stream parameters using the current structure of the IPPM Metrics Registry."

2. "The registry structure has been found to be insufficiently detailed to uniquely identify IPPM metrics."

3. "Despite apparent efforts to find current or even future users, no one responded to the call for interest in the RFC 4148 registry during the second half of 2010."

1.1. Terminology

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

[RFC6390] defines:

Performance Metric: A Performance Metric is a quantitative measure of performance, specific to an IETF-specified protocol or specific to an application transported over an IETF-specified protocol. Examples of Performance Metrics are the FTP response time for a complete file download, the DNS response time to resolve the IP address, a database logging time, etc.

Performance Metrics Directorate: The Performance Metrics Directorate is a directorate that provides guidance for Performance Metrics

development in the IETF. The Performance Metrics Directorate should be composed of experts in the performance community, potentially selected from the IP Performance Metrics (IPPM), Benchmarking Methodology (BMWG), and Performance Metrics for Other Layers (PMOL) WGs.

2. Guidelines for considering New Performance Metric Development

"Guidelines for Considering New Performance Metric Development", [RFC6390] defines a framework and a process for developing Performance Metrics for protocols above and below the IP layer (such as IP-based applications that operate over reliable or datagram

transport protocols). These metrics can be used to characterize traffic on live networks and services. As such, RFC 6390 does not define any Performance Metrics.

RFC 6390 scope covers guidelines for the Performance Metrics Directorate members for considering new Performance Metrics and suggests how the Performance Metrics Directorate will interact with the rest of the IETF.

2.1. Performance Metric Template Definition

RFC 6390 imposes a template to be used for Peformance Metrics specification.

Normative

- Metric Name
- Metric Description
- Method of Measurement or Calculation
- Units of Measurement
- Measurement Point(s) with potential Measurement Domain
- Measurement Timing

Informative

- Implementation
- Verification
- Use and Applications
- Reporting Model

2.2. Performance Metric Directorate

The performance metrics directorate mission is mentioned at [performance-metrics-directorate]:

> The Performance Metrics Directorate assists the OPS Area Directors to review performance-related documents intended for IESG review.
>
> The Performance Metrics Directorate can also act as advisors to Working Groups in any area of the IETF: it provides guidance to

> protocol development Working Groups when considering an Internet-Draft that specifies Performance Metrics for a protocol. Such can be arranged between the WG chairs and the Directorate Administrator (or the responsible ADs).
>
> In forthcoming reviews, the Performance Metrics Directorate will be applying the Guidelines for Considering New Performance Metric Development, RFC 6390.
>
> The review will be sent to the Performance Metrics Directorate mailing list (pm-dir@ietf.org), to the draft authors, WG chairs, and respective AD. The way to reach the authors, WG chairs, and respective AD is to send an email to "draft-name".all@tools.ietf.org.

In practice, a weekly cron job discovers all the IETF drafts that refers to RFC 6390, or that contains the keyword "performance metric". Once discovered, the different drafts are assigned a Peformance Metric Directorate reviewer. One of the primary task is to ensure that the RFC 6390 template is correctly applied, making sure that the Peformance Metric semantic is correctly specified.

3. Performance Metrics in the IPFIX Registry

There are multiple proposals to add performance metrics Information Elements in the IPFIX IANA registry [iana-ipfix-assignments], to be used with the IPFIX protocol [I-D.ietf-ipfix-protocol-rfc5101bis]. This is perfectly legal according the "Information Model for IPFIX" [I-D.ietf-ipfix-information-model-rfc5102bis] and "Guidelines for Authors and Reviewers of IPFIX Information Elements" [I-D.ietf-ipfix-ie-doctors].

Simply adding some text in the Information Element Description field might be a solution if this description is compliant with the RFC6390 template definition. However, this is not a ideal solution. On the top of having potentially long descriptions, this imposes a specific formatting for the description field of the performance metrics-related Information Elements, while none is imposed for the non performance metrics-related ones.

The preferred approach is for the Peformance Metrics to be self-described in their own registry. When the Peformance Metrics needs to be defined in the IPFIX IANA registry, the new Information Element can simply refer to the specific entry in the Peformance Metrics registry.

4. Initial Set of Performance Metrics

This section contains a list of Peformance Metrics specified according to [RFC6390], either in RFCs, or IETF drafts currently in the RFC editor queue.

Threshold in RTP: [RFC6958], appendix A

Sum of Burst Durations in RTP: [RFC6958], appendix A

RTP Packets lost in bursts: [RFC6958], appendix A

Total RTP packets expected in bursts: [RFC6958], appendix A

Threshold in RTP: [RFC6958], appendix A

Number of bursts in RTP: [RFC6958], appendix A

Sum of Squares of Burst Durations in RTP:
[RFC6958], appendix A

RTP Burst Loss Rate:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Burst Loss Rate:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Gap Loss Rate:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Burst Duration Mean:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Burst duration variance:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Burst Discard Rate:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

RTP Gap Discard Rate:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

Number of discarded frames in RTP:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

Number of duplicate frames in RTP:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

Number of full lost frames in RTP:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

Number of partial lost frames in RTP:
[I-D.ietf-xrblock-rtcp-xr-summary-stat], appendix A

Threshold in RTP:
[I-D.ietf-xrblock-rtcp-xr-burst-gap-discard], appendix A

RTP Packets discarded in bursts:

[I-D.ietf-xrblock-rtcp-xr-burst-gap-discard], appendix A

Total RTP packets expected in bursts:
[I-D.ietf-xrblock-rtcp-xr-burst-gap-discard], appendix A

Number of RTP packets discarded Metric:
[I-D.ietf-xrblock-rtcp-xr-discard], appendix A

de-jitter buffer nominal delay in RTP:
[I-D.ietf-xrblock-rtcp-xr-jb], appendix A

de-jitter buffer maximum delay in RTP:
[I-D.ietf-xrblock-rtcp-xr-jb], appendix A

de-jitter buffer high water mark in RTP:
[I-D.ietf-xrblock-rtcp-xr-jb], appendix A

de-jitter buffer low water mark in RTP:
[I-D.ietf-xrblock-rtcp-xr-jb], appendix A

5. Security Considerations

This draft doesn't introduce any security considerations. However, the definition of Peformance Metrics may introduce some security concerns, and should be reviewed with security in mind.

6. IANA Considerations

This document refers to an initial set of Peformance Metrics. The list of these Information Elements is given in the "Initial Set of Performance Metrics" Section. The Internet Assigned Numbers Authority (IANA) has created a new registry for Peformance Metrics called "Performance Metrics", and filled it with the initial list in Section 4.

New assignments for Peformance Metric will be administered by IANA through Expert Review [RFC5226], i.e., review by one of a group of experts designated by an IETF Area Director. The group of experts MUST check the requested Peformance Metric for completeness, accuracy of the template description, and for correct naming according to [RFC6390]. Requests for Performance Metric that duplicate the functionality of existing Performance Metris SHOULD be declined.

The specification of new Performance Metrics MUST use the template specified in Section 5.4.4 of RFC 6390 and MUST be published using a well-established and persistent publication medium. The experts will initially be drawn from the Working Group Chairs and document editors of the Peformance Metrics directorate [performance-metrics-directorate].

7. Acknowledgments

To be Completed

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