Registry for Performance Metrics

draft-ietf-ippm-metric-registry-05

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Registry Draft Updates

- 2 Goals and a recommendation:
  - IANA creates and maintains according to process
  - Define Registry Format
  - Encourage Re-using Registry Format “may be useful”
- URI column includes a URL to Registry Entry
  - human-readable, HTML references << ADD THIS!
- Reference Parameter names defined/included
  - Data Format MUST be included
- ToDo: Need One output Type per entry:
  - Raw OR Statistic, otherwise names get even longer…
  - Need to resolve this in 7.4.1
- ToDo: Refer to active + passive definitions draft

Initial Performance Metric Registry Entries

draft-morton-ippm-initial-registry-01

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(was: draft-mornuley-ippm-initial-registry-01)

Feedback on the Registry Contents

- Examination of Examples made it happen!
- LMAP Interim meeting provided a forum
  - Good reviews and suggestions from Barbara, Juergen and Tim.
  - Two-way street: Examples working toward better understanding of the LMAP models
- Section 4 of version 01 has been updated to address many comments:
  - Man-page/indented formatting for Parameters
  - Clearer role of Stream Generation
  - Lambda *is* the ave Poisson rate, params use 1/lambda

Open Issues

- Details of a Use case for Machine Parse-able sections of the registry (audience is Human):
  - Clarification that Controller/Collector may be the target audience
  - More details needed (what info MUST be parsed)
  - Add a single column with *all* info for machines?
- Binary Data Formats: What about Humans?
  - Could make key formats optional/selectable with a new Run-time field
- Standard Parameter names:
  - Many are consistent across metric RFCs, but not all
  - Example: “dT” is often re-used, maybe “2679-dT”

Next Steps

- Clear benefit to Adoption of this draft
  - The registry needs to be populated to be useful
  - Don’t let this get too far behind, we are improving registry review based on this draft.
- Discuss and close Open Issues
- Update other sections/registry entries.

BACKUP

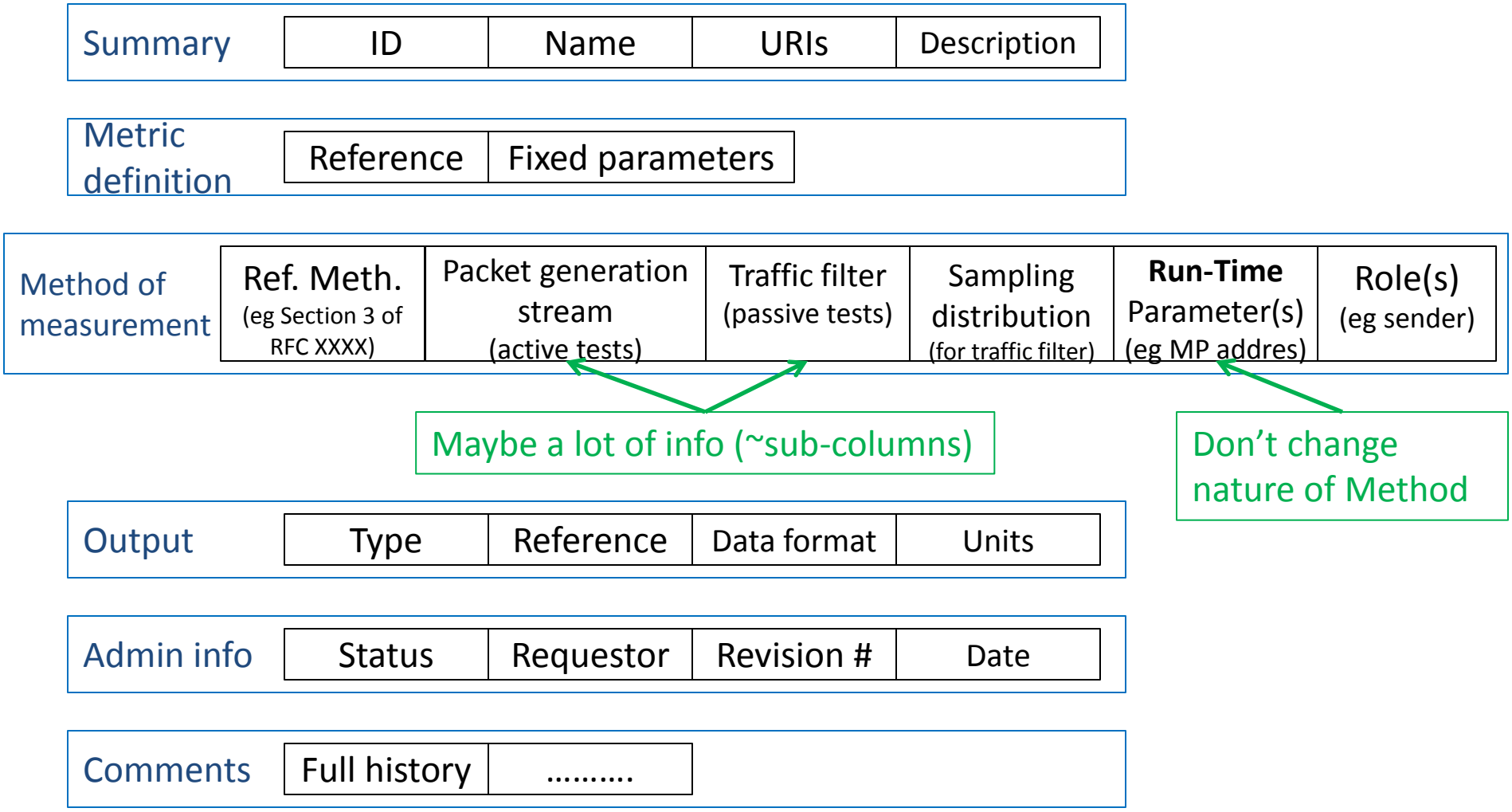
Overall Registry Concept

- Problem: How can we specify with Precision the Metrics and Methods to Implement and Use?
  - Many Standardized Metrics with similar names
  - Registry enables all parties to be sure they're talking about the same Metric
  - Flexibility and customization of Generic Metrics seen as an advantage in standards development
  - Methods allow variables, system issues out-of-scope
- Provide Unique ID and detailed exposition
  - Raise the bar from Standard to Registered Metrics
  - (How do we do that? Read on…)

Overall Registry Concept & Format

- draft-ietf-ippm-metric-registry-04
- Each entry in the registry is a row
  - Series of columns
    - Typically ~1 column may be Not Applicable
  - Clustered in categories
- Each row is indexed by ID
  - 16 bit flat identifier
  - With associated name (i-d defines naming convention)
  - Auto-generate URI (pre-pend urn:ietf:params:ippm:metric: to name)
  - Auto-generate URL (location of text file with registry entry)
- Control & report protocols use URI
- Next slide shows category /column headings
  - Layout is purely presentational (slide not wide enough, neither is anyone's screen, which is why the text file presentation is available)

Columns & categories



How do I get a registry entry?

- Submit request to IANA, with columns filled in
  - Likely prior review in WG
- Review by performance metric experts
  - If necessary, work on improvements with requester
  - Does the proposed registry entry clearly define the metric & method of measurement?
  - Is it different from existing registry entries?
  - Is it operationally useful (significant industry interest or been deployed)?
- IANA adds to registry
- Similar process for revisions
  - Must be backwards compatible (eg editorial)
  - Otherwise create a new metric (& maybe deprecate old one)

Names, identifiers and URIs

- We keep identifiers, names and we automatically generate URIs
  - Identifiers are flat 16-bit integers
  - Names are unique within the registered metrics
  - URIs are generated by prepending urn:ietf:params:performance:metric to the name
- Also, a URL to a text file containing the Registry Entry

End Review, now some Entries

4. UDP Round-trip Latency Registry Entry
   - 4.1. Summary
     - 4.1.1. ID (Identifier)
     - 4.1.2. Name
     - 4.1.3. URI
     - 4.1.4. Description
   - 4.2. Metric Definition
     - **4.2.1. Reference Definition**
     - **4.2.2. Fixed Parameters** .
   - 4.3. Method of Measurement
     - **4.3.1. Reference Method**
     - 4.3.2. Packet Generation Stream
     - 4.3.3. Traffic Filtering (observation) Details
     - 4.3.4. Sampling Distribution
     - **4.3.5. Run-time Parameters and Data Format**
     - 4.3.6. Roles
   - 4.4. Output
     - 4.4.1. Type
     - 4.4.2. Data Format
     - 4.4.3. Reference
     - 4.4.4. Metric Units
   - 4.5. Administrative items
     - 4.5.1. Status
     - 4.5.2. Requestor (keep?)
     - 4.5.3. Revision
     - 4.5.4. Revision Date
   - 4.6. Comments and Remarks

passive ex: https://tools.ietf.org/html/draft-mornulo-ippm-registry-columns-01#section-6

4.2.1 Reference Definition

<Full bibliographic reference to an immutable doc.>

Almes, G., Kalidindi, S., and M. Zekauskas, "A Round-trip Delay Metric for IPPM", RFC 2681, September 1999.

[RFC2681]

<specific section reference and additional clarifications, if needed>

Section 2.4 of [RFC2681] provides the reference definition of the singleton (single value) Round-trip delay metric. Section 3.4 of [RFC2681] provides the reference definition expanded to cover a multi-value sample. Note that terms such as singleton and sample are defined in Section 11 of [RFC2330].

Note that although the definition of "Round-trip-Delay between Src and Dst at T" is directionally ambiguous in the text, this metric tightens the definition further to recognize that the host in the "Src" role will send the first packet to "Dst", and ultimately receive the corresponding return packet from "Dst" (when neither are lost).

4.2.2 Fixed Parameters

Type-P:

- **IPv4 header values:**
  - **DSCP: set to 0**
  - **TTL set to 255**
  - **Protocol: Set to 17 (UDP)**
- **UDP header values:**
  - **Checksum: the checksum must be calculated**
- **Payload**
  - **Sequence number: 8-byte integer**
  - **Timestamp: 8 byte integer. Expressed as 64-bit NTP timestamp as per section 6 of RFC 5905 [RFC5905]**
  - **No padding (total of 9 bytes)**

Timeout, Tmax: 3 seconds

4.3.1 Reference Method

<for metric, insert relevant section references and supplemental info>

The methodology for this metric is defined as Type-P-Round-trip-Delay-Poisson-Stream in section 2.6 of RFC 2681 [RFC2681] and section 3.6 of RFC 2681 [RFC2681] using the Type-P and Timeout defined under Fixed Parameters.

The method requires sequence numbers or other send-order information to be retained at the Src or included with each packet to dis-ambiguate packet reordering if it occurs. Sequence number is part of the payload described under Fixed Parameters.

Refer to Section 4.4 of [RFC6673] for expanded discussion of the instruction to "send a Type-P packet back to the Src as quickly as possible" in Section 2.6 of RFC 2681 [RFC2681]. Section 8 of [RFC6673] presents additional requirements which shall be included in the method of measurement for this metric.

4.3.5 Run-time Parameters and Data Format

<list of run-time parameters, and their data formats>

- **Src, the IP address of a host (32-bit value for IPv4, 128-bit value for IPv6)**
- **Dst, the IP address of a host (32-bit value for IPv4, 128-bit value for IPv6)**
- **T0, a time (start of measurement interval, 128-bit NTP Date Format, see section 6 of [RFC5905]). When T0 is "all-zeros", a start time is unspecified and Tf is to be interpreted as the Duration of the measurement interval.**
- **Tf, a time (end of measurement interval, 128-bit NTP Date Format, see section 6 of [RFC5905]), interpreted as the Duration of the measurement interval.**
- **1/lambda, average packet rate (for Poisson Streams). (1/lambda = 1 packet per second, if fixed)**
- **Upper limit on Poisson distribution (values above this limit will be clipped and set to the limit value). (if fixed, Upper limit = 30 seconds.)**

4.3.5 Run-time Parameters and Data Format

(continued)

The format for 1/lambda and Upper limit of Poisson Dist. are the short format in [RFC5905] (32 bits) and is as follows: the first 16 bits represent the integer number of seconds; the next 16 bits represent the fractional part of a second.

>>> should Poisson run-time params be fixed instead? probably yes if modeling a specific version of MBA tests.

MORE QUESTIONS -=-

>>> Should we require that each Registry entry have a SINGLE output Format and Statistic ?
(now, the answer is yes)

>>> Should we require that each Registry entry specify the Test Protocol used to collect the metric ?
(seems impractical, MUCH duplication)

>>> Current Entries are Detailed. A kind of roadmap to IPPM Literature. Should we retain this practice (at the risk of non-equivalent metrics)? If you were implementing, would you find this detail helpful?

Section

Example Registry Entry Names: