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# Examples of LMAP Objects using IPPM Metrics and Protocols
## draft-morton-lmap-examples-01

## Abstract

In order to examine the completeness and coverage of the LMAP info and data models, we present examples expressing information from IP Performance Metric working group metrics and protocols, and the Performance Metrics Registry. The main update in the version provides a more realistic and useful example of the Cycle_ID in measurement instruction and reporting.

## Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

## Status of This Memo

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## 1. Introduction

The Large-scale Measurement of Broadband Performance (LMAP) working group has completed a Framework [RFC7594] and Use cases, and now proceeds with development of an information model [I-D.ietf-lmap-information-model] and data model.

The IETF IP Performance Metrics (IPPM) working group first created a framework for metric development in [RFC2330]. This framework has largely stood the test of time and enabled development of many fundamental metrics. It has been updated once in the area of metric composition [RFC5835], and again in several areas related to active stream measurement of modern networks with reactive propoerties [RFC7312]. The Working Group has developed an extensive set of Standards Track Metrics and Measurment Protocols. Among the work especially relevant to LMAP is the development of a Performance Metrics Registry [I-D.ietf-ippm-metric-registry], and a proposal for the initial regsitry contents [I-D.morton-ippm-initial-registry].

This memo is orgainzed into sections that present an example of LMAP Control and Reporting by populating the various information model

objects for measurement Tasks and Reporting Tasks (and eventually Schedule, Event, Action, etc).

The first example is a UDP Round Trip Latency Metric.

## 2. Scope and Purpose

The purpose of this memo is to examine the features and capabilities of the LMAP information model [I-D.ietf-lmap-information-model] by populating the models with example data intended to enable measurement of IPPM metrics.

The scope is to create the examples for Active Metrics and their Methods of Measurement, as defined in the IPPM literature of Standards Track Metrics. Specifically, Metrics in the proposed initial contents for the Performance Metrics Registry [I-D.ietf-ippm-metric-registry] contined in [I-D.ietf-ippm-metric-registry] are the primary focus, along with existing standards track measurement protocols developed in IPPM [RFC4656] [RFC5357].

## 3. UDP Round Trip Latency

This draft presents information in a conceptual form. Safeguarding correct syntax is a collosal non-goal in the early drafts.

### 3.1. Measurement Task Capabilities

```
   Example:
   Measurement Capability [
      Measurement Protocol [
          Protocol Roles [ ]
      ]
      Registry URI  [
          Method Roles [ ]
      ]
   ]
   so, an example would be

   Measurement Capability [
       TWAMP [
          Control-Client; Session-Sender; Server; Session-Reflector;
          ]
       Prefix:Act_IP_UDP_Round-trip_Delay_95th-percentile_Poisson [
          Src; Dst;
       ... more URIs and Roles ...
          ]
   ]
   for a fully-capable MA.
```

## 3.2. Instruction Object

### 3.3.1. Definition of ma-instruction-obj

```
     object {
         ma-task-obj         ma-instruction-tasks<0..*>;
            name:UDP_RT_Metrics_001;
         ma-channel-obj      ma-report-channels<0..*>;
         ma-schedule-obj     ma-instruction-schedules<0..*>;
         ma-suppression-obj  ma-suppression;
     } ma-instruction-obj;
```

## 3.3. Measurement Task

#### 3.9.1. Definition of ma-task-obj

```
object {
    string              ma-task-name;
      task-name: UDP_RT_Metrics_001;
    uri                 ma-task-registry-entries<1..*>;
      Prefix: Act_IP_UDP_Round-trip_Delay_95th-percentile_Poisson;
      Prefix: Act_IP_UDP_Round-trip_Delay_Mean_Poisson;
   [ma-option-obj       ma-task-options<0..*>];
      option-role: Src;  option-meas_point: mp100;
      option-measurement_protocol: TWAMP;
      option-meas_protocol_roles: Control-Client; Session-Sender;
      option-Src_IP: xxx.xxx.xxx;
      option-Dst_IP: xxx.xxx.xxx;
      option-T0:  0;  option-lambda: 1 second;
      option-Tf:  15 min; option-truncate: 30 seconds;
   [boolean             ma-task-suppress-by-default;]
      suppress: true;
   [string              ma-task-cycle-id;]
      cycle-id: Access_2016-03-21-0930;
} ma-task-obj;
```

```
Prefix = urn:ietf:params:performance:metric
```

## 3.4. Report

#### 3.6.1. Definition of ma-report-obj

```
object {
    datetime            ma-report-date;
   [uuid                ma-report-agent-id;]
   [string              ma-report-group-id;]
   [ma-report-task-obj  ma-report-tasks<0..*>];
       name:UDP_RT_Metrics_REPORT_001;
} ma-report-obj;
```

## 3.5. Report Task

#### 3.6.2. Definition of ma-report-task-obj

```
object {
    string              ma-report-task-name;
       task-name: UDP_RT_Metrics_REPORT_001;
   [uri                 ma-report-task-registry-entries<1..*>;]
      Prefix: Act_IP_UDP_Round-trip_Delay_95th-percentile_Poisson;
      Prefix: Act_IP_UDP_Round-trip_Delay_Mean_Poisson;
   [ma-option-obj       ma-report-task-options<0..*>];
      option-role: Src;  option-meas_point: mp100;
      option-measurement_protocol: TWAMP;
      option-meas_protocol_roles: Control-Client; Session-Sender;
      option-Src_IP: xxx.xxx.xxx;
      option-Dst_IP: xxx.xxx.xxx;
      option-T0:  0;
      option-Tf:  15 minutes;
   [ma-option-obj       ma-report-task-action-options<0..*>];
   [string              ma-report-task-cycle-id;]
      cycle-id: Access_2016-03-21-0930;
   [string              ma-report-task-column-labels<0..*>;]
      label: Mean; label: 95%-tile;
   [ma-report-row-obj   ma-report-task-rows<0..*>;]
      row(0): 0.25; 0.34;
} ma-report-task-obj;
```

### 3.6. Schedule

TBD

## 4. Security Considerations

The security considerations that apply to any active measurement of live paths are relevant here as well. See [RFC4656] and [RFC5357].

When considering privacy of those involved in measurement or those whose traffic is measured, the sensitive information available to potential observers is greatly reduced when using active techniques which are within this scope of work. Passive observations of user traffic for measurement purposes raise many privacy issues. We refer the reader to the privacy considerations described in the Large Scale Measurement of Broadband Performance (LMAP) Framework [RFC7594], which covers active and passive techniques.

## 5. IANA Considerations

This memo makes no requests of IANA.

## 6. Acknowledgements

The author thanks LMAP Participants for their comments.

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