LMAP 2016-01-12 Interim Input for Discussion

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IPPM registry relationship

- Issue:
  - How does the IPPM registry relate to the LMAP information and data models?
  - Is the registry expected to provide machine readable information to drive automation or not?
- Proposal:
  - Consider the registry to define things at a conceptual level, i.e., treat the registry as an information model
  - To support automation and interoperability, the machine readable parts of a registry (runtime parameters, output formats) may be written down as a YANG data model

IPPM start/stop parameters

- Issue:
  - IPPM metrics often have a start time T0 and a stop time Tf
  - LMAP models only provide a start event and they assume tasks determine on their own when to stop
- Proposal:
  - Add an optional stop event so that T0 and Tf are both covered by the LMAP models

IPPM run-time parameters

- Issue:
  - IPPM defines a number of run-time parameters for each metric
  - LMAP only provides generic options
  - The mapping between run-time parameters and options is unclear
- Proposal:
  - Change the data model to allow data model extensions that augment specific parameters into schedule definitions
  - The glue between the IPPM metrics registry and the LMAP model is realized via model extensions

LMAP parameters model changes

-02:

```
+--rw schedules
    | +--rw schedule* [name]
    |    +--rw name           string
    |    +--rw event          event-ref
    |    +--rw action* [name]
    |    |  +--rw name          string
    |    |  +--rw task          task-ref
    |    |  +--rw option* [name]
    |    |  |  +--rw name    string
    |    |  |  +--rw value?  string
```

-03:

```
+--rw schedules
    | +--rw schedule* [name]
    |    +--rw name           string
    |    +--rw start          event-ref
    |    +--rw stop           event-ref
    |    +--rw parameter
    |    |   +--rw (extension)?
    |    +--rw action* [name]
    |    |  +--rw name          string
    |    |  +--rw task          task-ref
    |    |  +--rw option* [name]
    |    |  |  +--rw name    string
    |    |  |  +--rw value?  string
```

IPPM parameters model example

```
module example-ietf-ippm-udp-latency {

  augment "/lmap:lmap/lmap:schedules/lmap:schedule/lmap:action"
      + "/lmap:parameter/lmap:type" {
   description
     "This augmentation adds parameters specific to IPPM UDP
      latency metrics.";

  case "ietf-ippm-udp-latency" {
   leaf src-ip {
     type inet:ip-address;
     description
       "The source IP address of the UDP measurement traffic.";
   }

   leaf src-port {
     type inet:port-number;
     description
       "The source port number of the UDP measurement traffic.";
   }

   leaf dst-ip {
     type inet:ip-address;
     description
       "The destination IP address of the UDP measurement traffic.";
   }
```

```
   leaf dst-port {
     type inet:port-number;
     description
       "The destination port number of the UDP measurement traffic.";
   }

   leaf poisson-lambda {
    type decimal64 {
      fraction-digits 4;
    }
    units "seconds";
    default 1.0000;
    description
      "The average interval for the poisson stream with a resolution
       of 0.0001 seconds (0.1 ms).";
   }

   leaf poisson-limit {
    type decimal64 {
      fraction-digits 4;
    }
    units "seconds";
    default 30.0000;
    description
      "The upper limit on the poisson distribution with a resolution
       of 0.0001 seconds (0.1 ms).";
   }
 }
```

Example schedule configuration

```
<schedule>
    <name>hourly-schedule</name>
    <start>hourly</start>
    <stop>hourly-plus-5min</stop>
    <action>
     <name>udp-latency-weekdays-hourly</name>
     <parameter xmlns:udp="urn:example:ietf-ippm-udp-latency">
       <udp:src-ip>192.0.2.1</udp:src-ip>
       <udp:src-port>4242</udp:src-port>
       <udp:dst-ip>192.0.2.2</udp:dst-ip>
       <udp:dst-port>2424</udp:dst-port>
       <udp:poisson-lambda>1.000</udp:poisson-lambda>
       <udp:poisson-limit>30.0000</udp:poisson-limit>
     </parameter>
     <task>udp-latency-measurement</task>
     <destination>daily-schedule</destination>
    </action>
 </schedule>
```

IPPM outputs

- Issue:
  - IPPM defines a number of outputs for each metric
  - LMAP only provides generic CSV like results
  - Sometimes more complex result structures may be needed (recall RIPE Atlas statement at IETF 94)
- Proposal:
  - Change the data model to allow data model extensions that augment specific outputs into results
  - (Similar to the parameters example but details left to be worked out.)