



OML Overview

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Australian Government
**Department of Communications,
Information Technology and the Arts**
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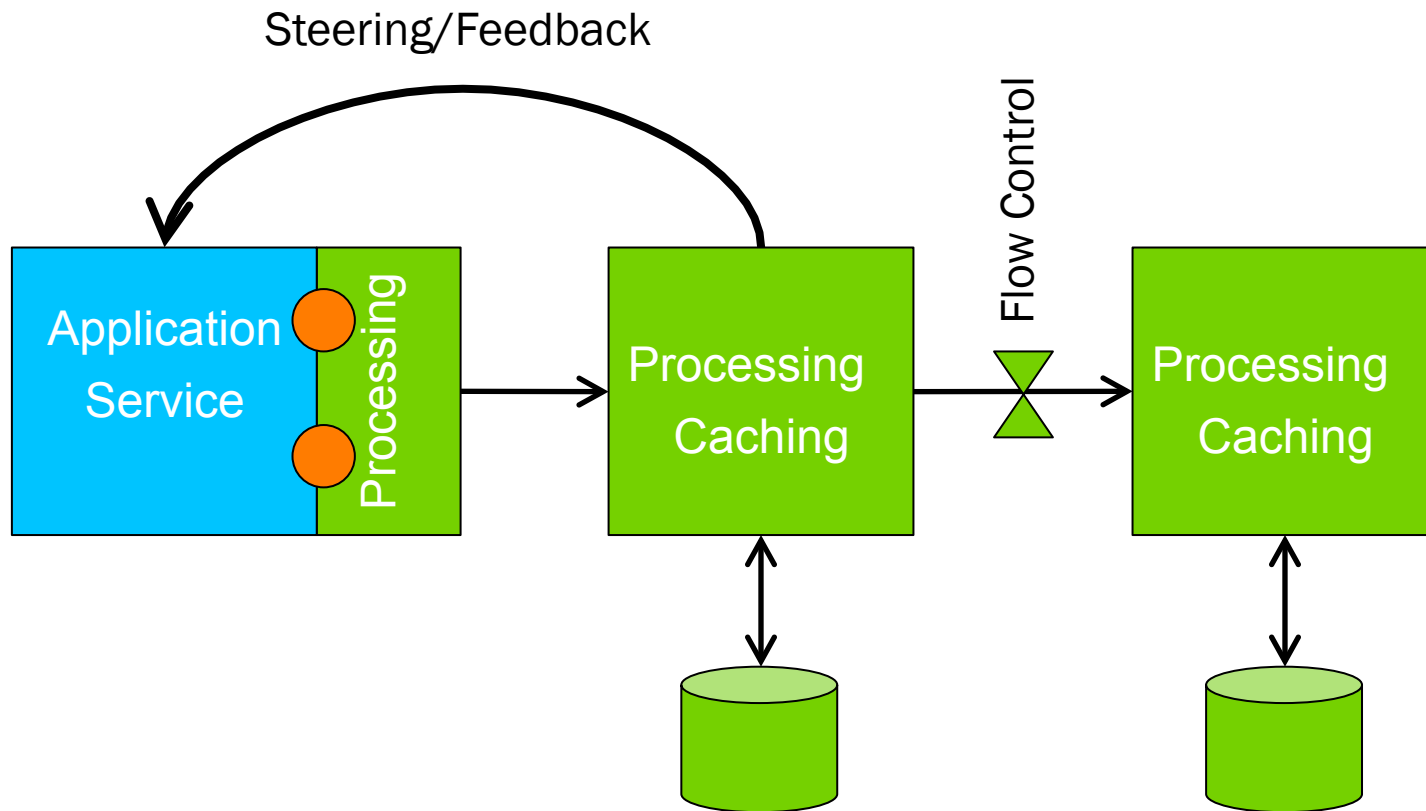


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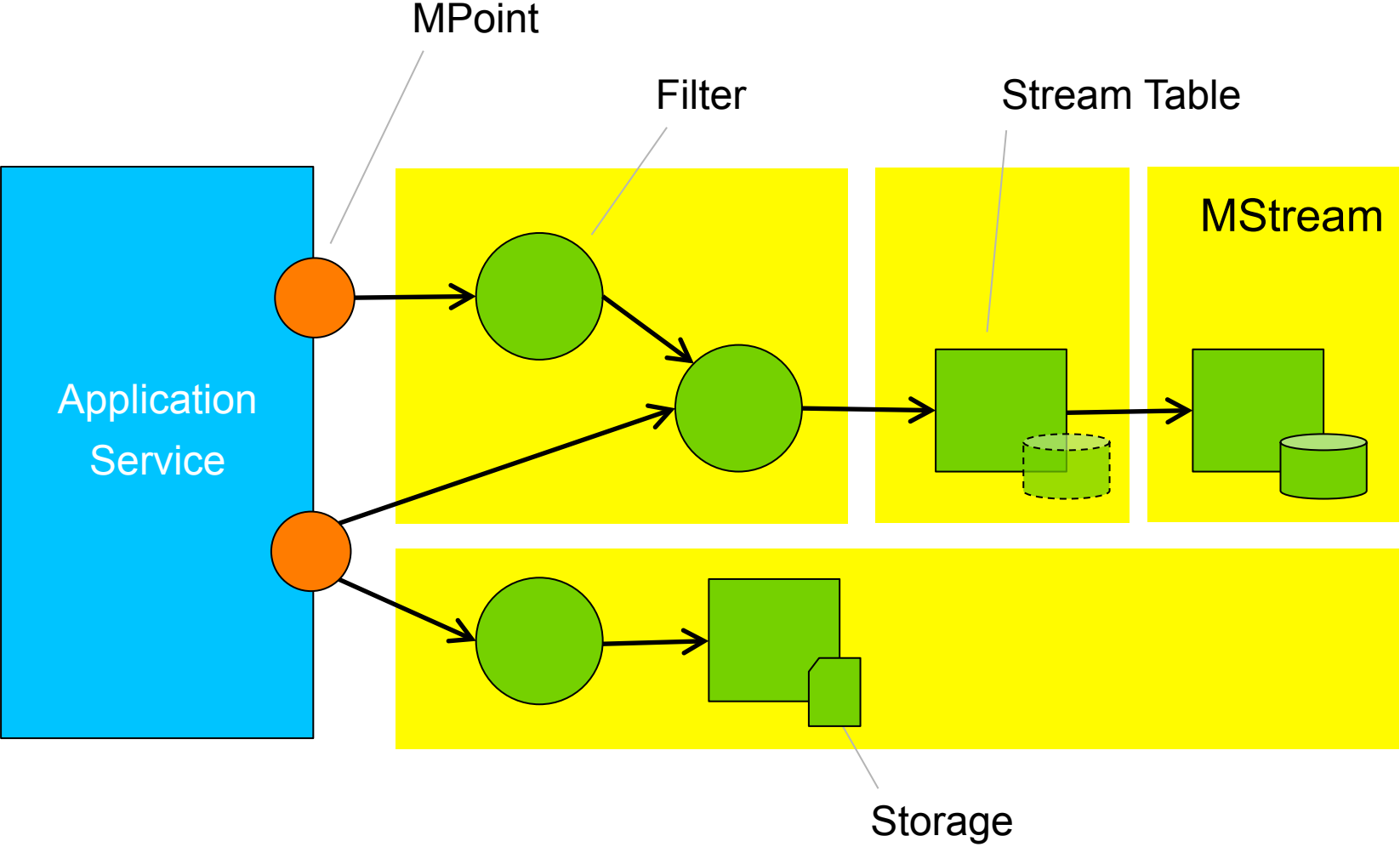
Goals of OML

- All experiment output in one place
- Capturing everything – most importantly meta data
- Separation of concerns
 - Instrumenting
 - Collecting
- Minimizing measurement collection overhead
 - Time
 - Traffic interference
- Support for steerable experiments
 - Access to data in different places

Concepts



Concepts



Defining MPoints

```
defApplication('system:app:otg') do |a|  
  ...  
  a.defMeasurement('channel') do |m|  
    m.defMetric('size', :int)  
    m.defMetric('speed', :float)  
    ...  
  end  
  
end
```

Defining MStreams

```
defGroup('g2') do |g|
  g.addApplication('system:app:otg') do |a|

    a.measure('channel', :samples => 10) do |m|
      m.metric 'size', :filter => 'avg'
    end

  end

end
end
```

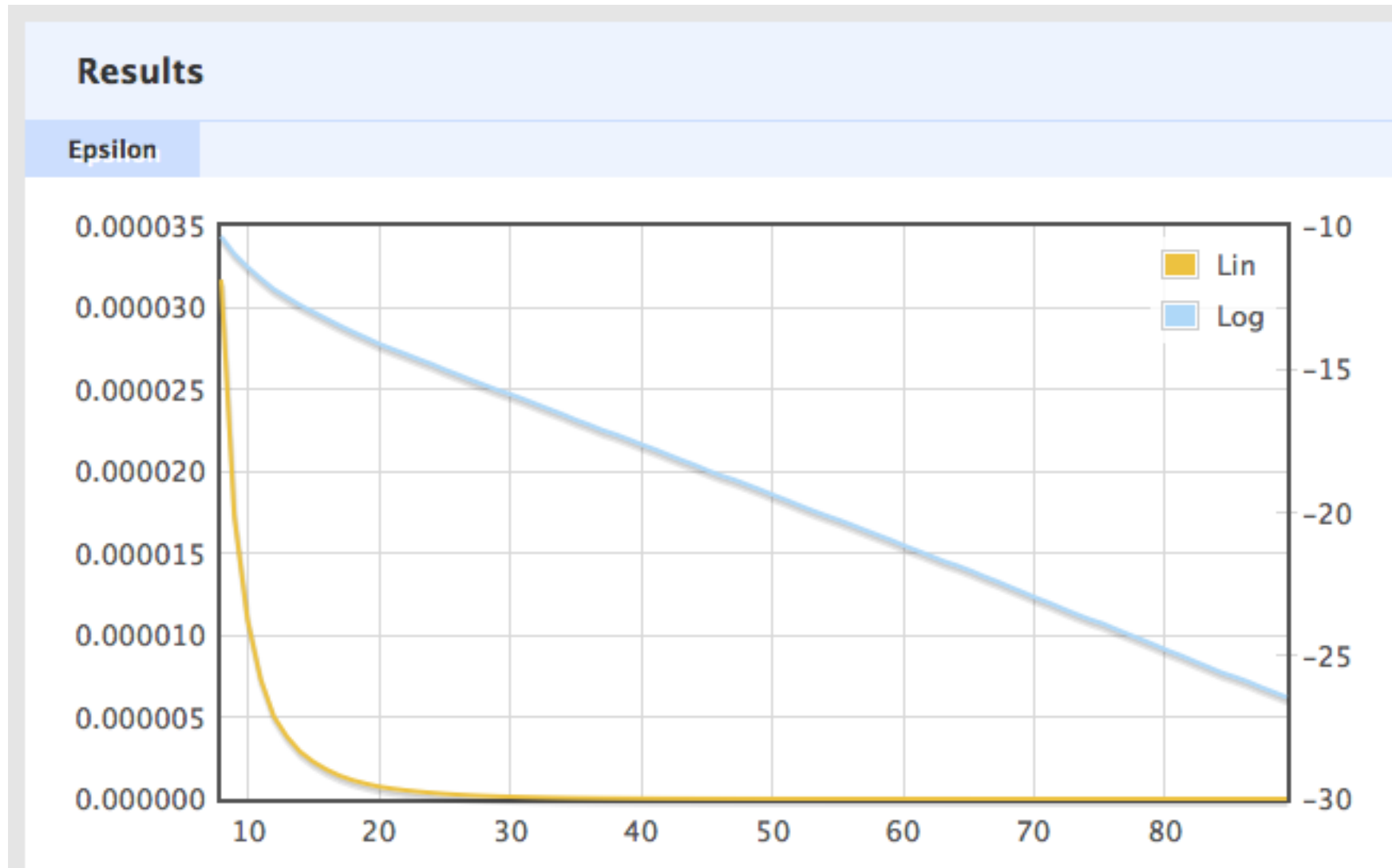
OML – Dynamic Schema

```
--  
-- Database Dump  
-- Experiment ID: planetlab_2010_03_17_15_34_28  
--  
BEGIN TRANSACTION;  
CREATE TABLE _experiment_metadata (key TEXT PRIMARY KEY, value TEXT);  
INSERT INTO "_experiment_metadata" VALUES('start_time', '1268854520');  
CREATE TABLE _senders (name TEXT PRIMARY KEY, id INTEGER UNIQUE);  
INSERT INTO "_senders" VALUES('planetlabWorkers', 1);  
INSERT INTO "_senders" VALUES('theBoss', 2);  
CREATE TABLE p2pdc_precision (oml_sender_id INTEGER, oml_seq INTEGER, oml  
INSERT INTO "p2pdc_precision" VALUES(1, 1, 1.641581999138, 1.647726, 0.0, 0.0,  
INSERT INTO "p2pdc_precision" VALUES(1, 1, 2.07088499888778, 2.123105, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 2, 2.64388699829578, 2.649923, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 2, 2.92894299887121, 3.072302, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 2, 3.07133099809289, 3.123751, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 3, 3.64539199694991, 3.651354, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 3, 3.93069499731064, 4.07375, 0.0, 0.0  
INSERT INTO "p2pdc_precision" VALUES(1, 3, 4.07230899482965, 4.124823, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 4, 4.64793699979782, 4.65394, 0.0, 0.0  
INSERT INTO "p2pdc_precision" VALUES(1, 4, 4.93152399733663, 5.074406, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 4, 5.07329199463129, 5.125821, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 5, 5.64993699640036, 5.656172, 0.0, 0.  
INSERT INTO "p2pdc_precision" VALUES(1, 5, 5.93308599293232, 6.0766, 0.0, 0.0,  
INSERT INTO "p2pdc_precision" VALUES(1, 5, 6.0744209960103, 6.126894, 0.0, 0.0  
INSERT INTO "p2pdc_precision" VALUES(1, 6, 6.65103400624720, 6.657572, 0.0, 0.0
```

Defining Visualisation

```
addTab(:graph2) do |tab|
  # Epsilon
  tab.addGraph("Epsilon", opts) do |g|
    lin = []; log = []
    t = ms('precision')
    q = t.where(t['oml_sender_id'].eq(2))
    q.project(:oml_ts_server, :Precision_min).each do |row|
      t, p = row.tuple
      unless (p == 0)
        lin << [t, p]
        log << [t, Math.log(p)]
      end
    end
    g.addLine(lin, :label => 'Lin')
    g.addLine(log, :label => 'Log', :yaxis => 2)
  end
end
```


Defining Visualisation



OML'ified Application

- Traffic Generation/Measurements
 - OTG ... Traffic Generator
 - Iperf
- Monitoring
 - Libtrace
 - Libsigar
 - Spectrum Analyzer
 - GPS
 - (Weather)
- Components
 - TinyOS/Motes
 - (GnuRadio)

Filters

- Plug-in Architecture
- User extensibility
- Current List
 - Stddev
 - Average
 - First
 - Histogram

Status

- <http://omf.mytestbed.net/projects/show/oml>
- MIT License
- **2009-09-11: Release of version 2.3**
 - Support for re-starting existing experiments (long running)
 - Supports for text-based protocol for simple clients
 - Experimental API for implementing custom filters

Future

- Additional data types (IP, blob)
 - Potentially move to IPFIX
- Multi-dimensional data (spectrum, geographic – trip line)
- Triggers (Steerable)
- Resolve service integration vs. observation
- Streaming database
- (Distributed processing – map/reduce)
- ((Privacy))



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