New Developments in OMF

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ANU — THE AUSTRALIAN NATIONAL UNIVERSITY
UNSW — THE UNIVERSITY OF NEW SOUTH WALES
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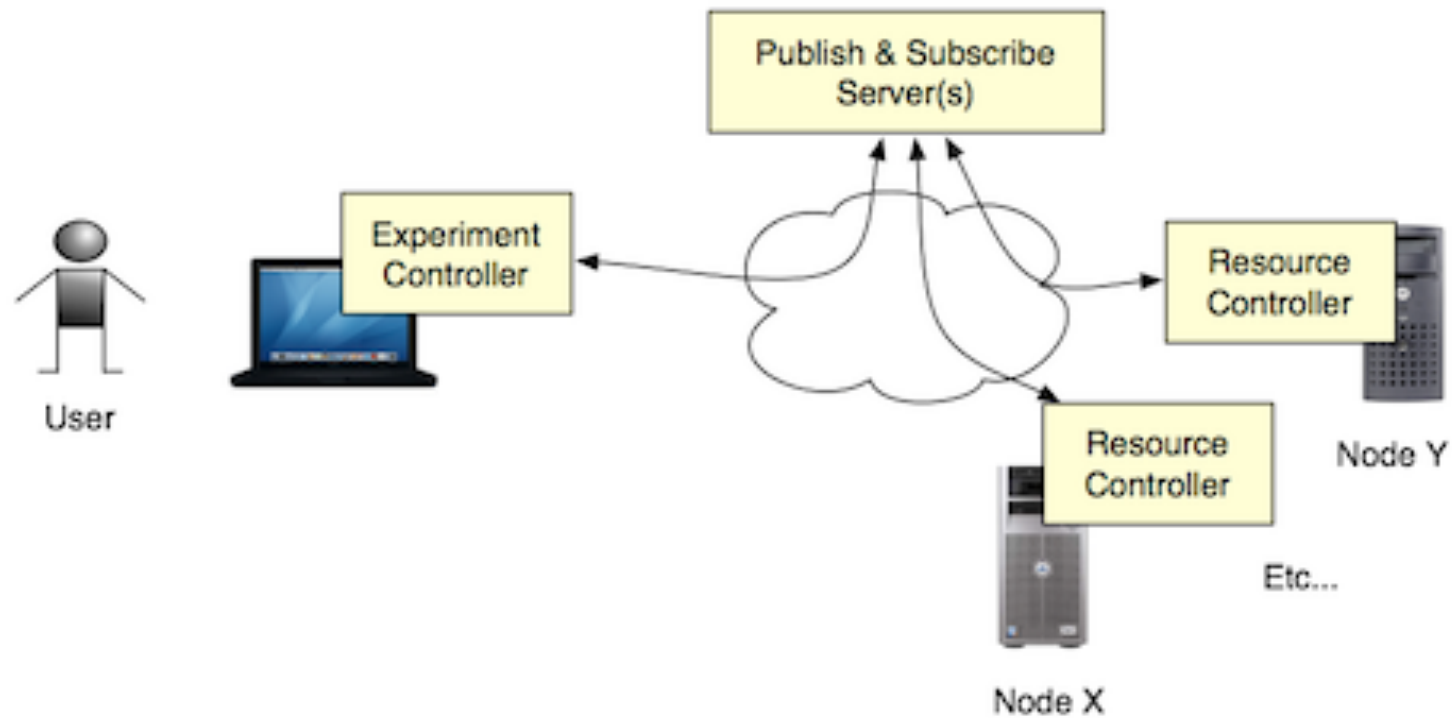THE UNIVERSITY OF QUEENSLAND AUSTRALIA
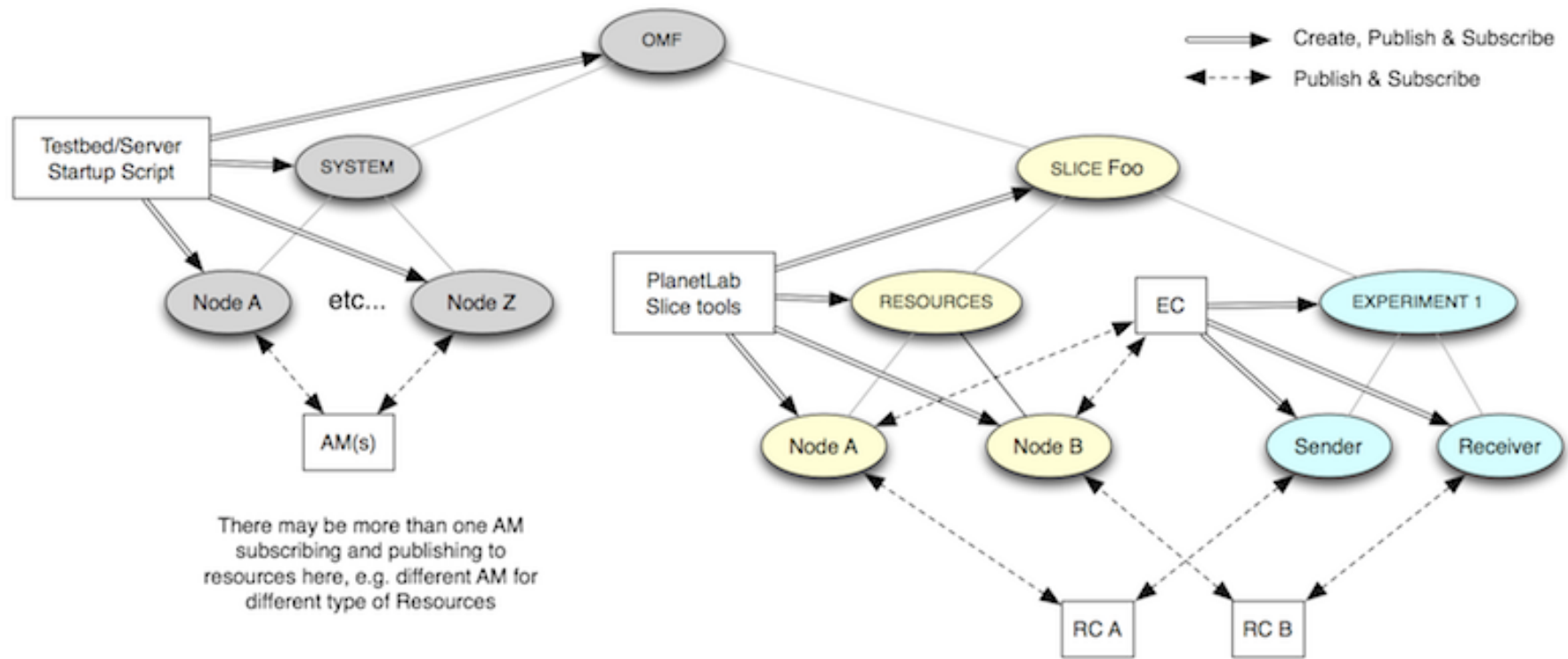**NICTA Partners**

from imagination to impact

In a nutshell

- Federation support (w/ SFA/Planetlab)
  - Generalised resource names (no more grid coordinates)
- Better integrated Measurement Support
  - Native support of relational algebra (no need to write SQL)
  - Practical visualization
- Network emulation support
  - MAC addresses from inventory
  - Support for finer-grain emulation (netem) BETA
- Mote/TinyOS support BETA
  - Deployment of code from Experiment Controller (EC)
  - Integration w/ OML
- IREEL: Learning Platform

Federation Support

Federation Support

Defining Measurment Streams

```
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
```
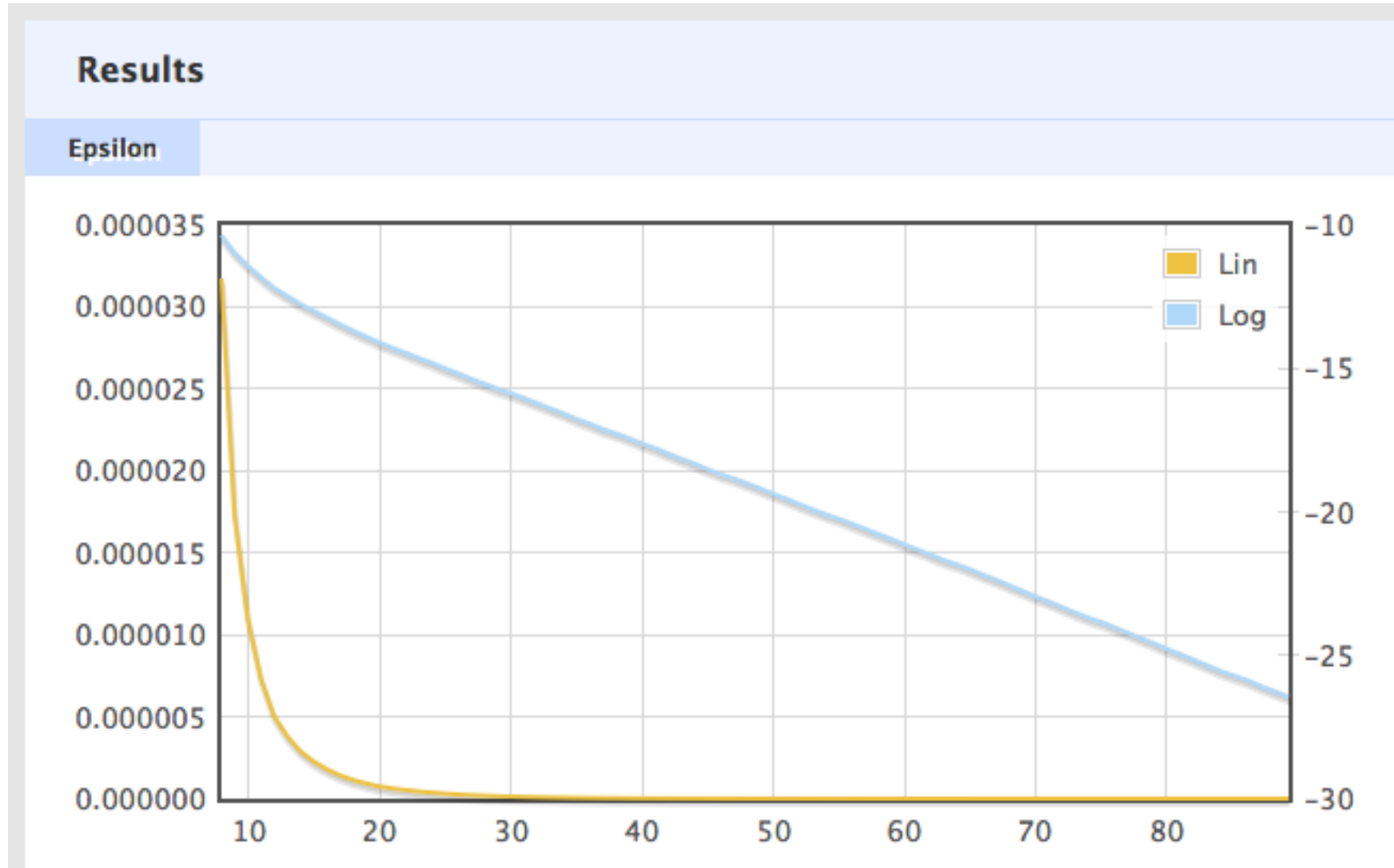
OML – Dynamic Schema

```
--
-- 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(1,6,6.65193499624720,6.657573,0.0,0.
```

Defining Visualization

```
addTab(:graph2) do |tab|
  # Epsilon
  tab.addGraph("Epsilon", opts) do |g|
    lin = []; log = []
    t = ms('precision')
    q = t.where( t[:SENDER_ID] == 2)
    q.project(t[:TS_SERVER], t['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
```
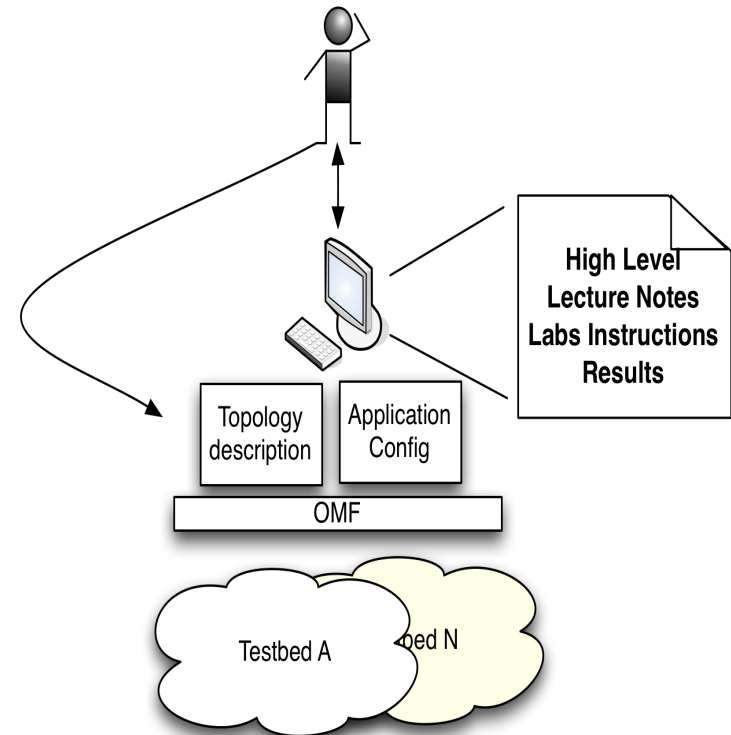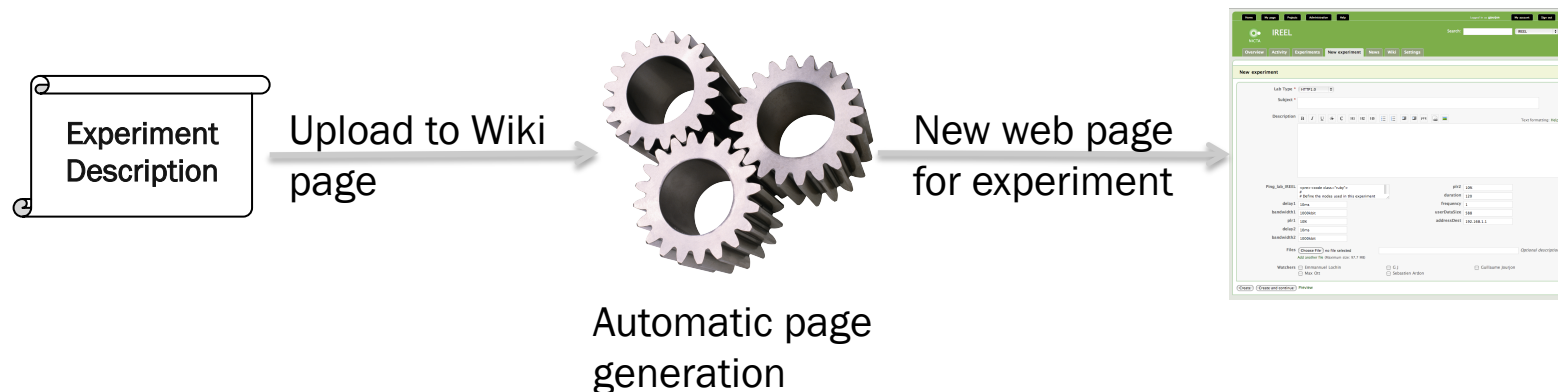
Defining Visualization

IREEL: E-learning platform on top of testbeds

- Wiki meets Experiment Controller
  - Lab instructions on Wiki
  - Lab experiments in OEDL
  - Automatic form generation
  - Automatic experiment workflow
  - Lab note book on Wiki as well
- Low-cost deployment
- Reproducibility of simple experiments over multiple testbeds.
- Facilitating the shift from beginner to advanced user of testbeds.
  - Student can look under the hood

High Level
Lecture Notes
Labs Instructions
Results

Topology description

Application Config

OMF

Testbed A

Testbed N

NICTA

Simplified development of Lab experiments

1. Design experiment
2. Code experiment in OEDL script
3. Test on a sandbox
4. Upload script on the web site
5. Automatic generation of configuration page for students

Experiment Description → Upload to Wiki page → Automatic page generation → New web page for experiment

IREEL

Looking for Collaborators!