



# Will RSpec help us to do better Science?

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With lots of help from Thierry Rakotoarivelo & Guillaume Jourjon



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

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Why are we doing what we are doing?

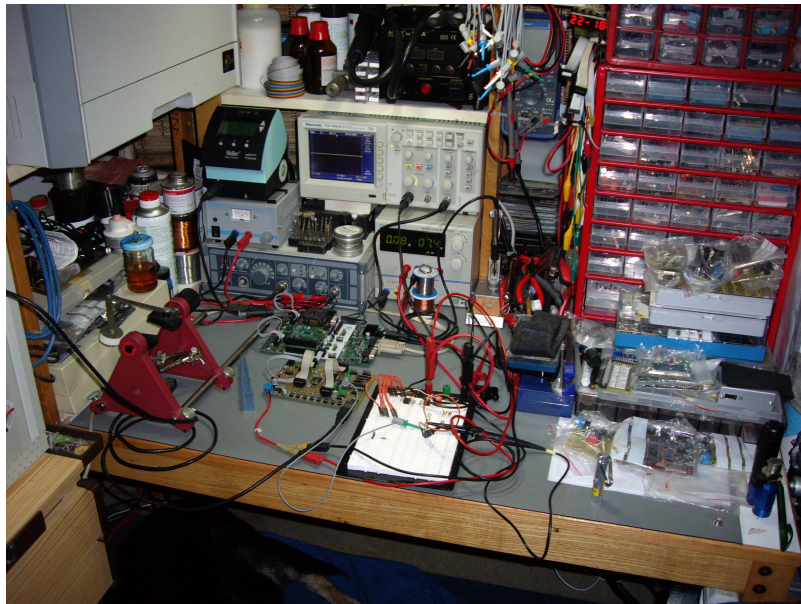


Curious Bunch - Want to figure out new things

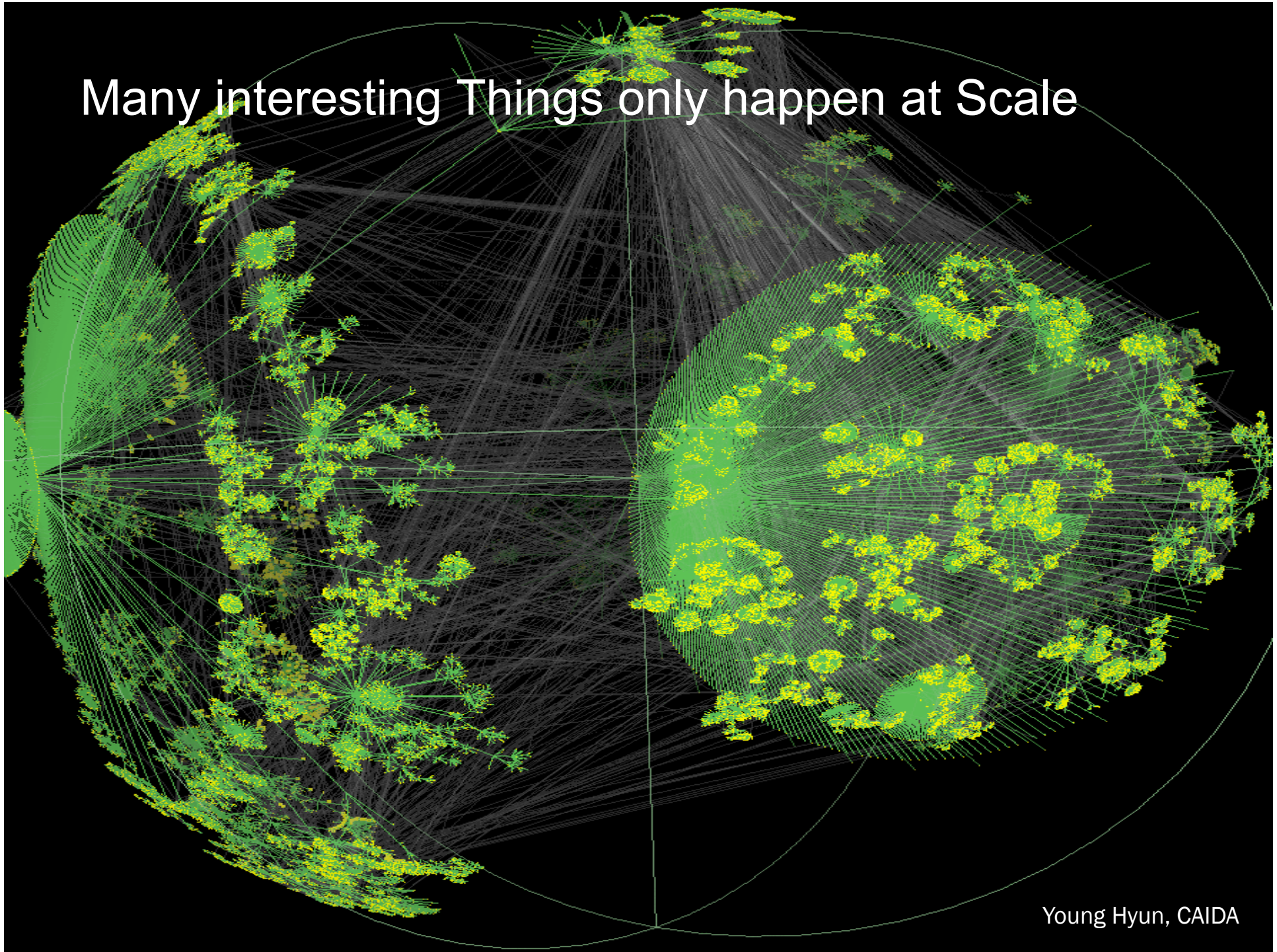


# The advancement of science depends in general on the interplay between experimental studies and theory

Wikipedia



Many interesting Things only happen at Scale



Young Hyun, CAIDA



CERNET 2



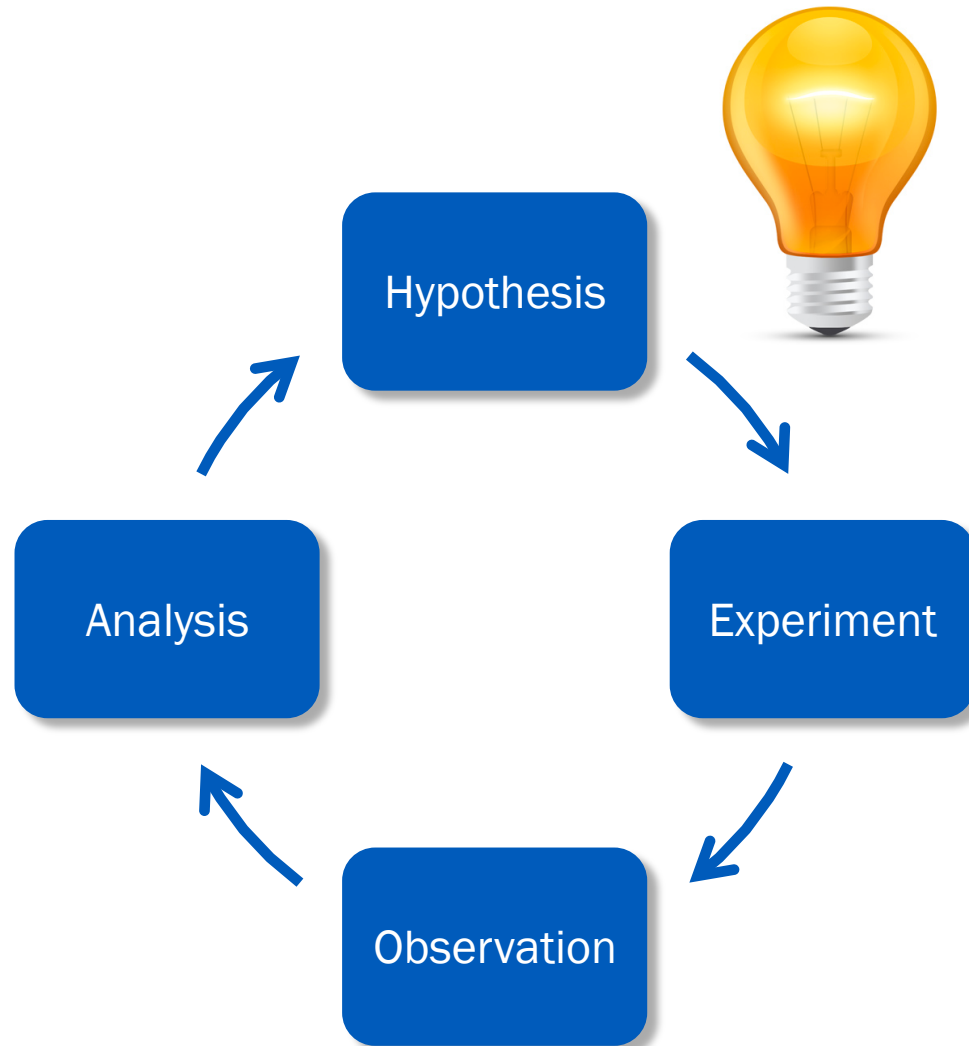
## Need for LARGE Experimental Facilities

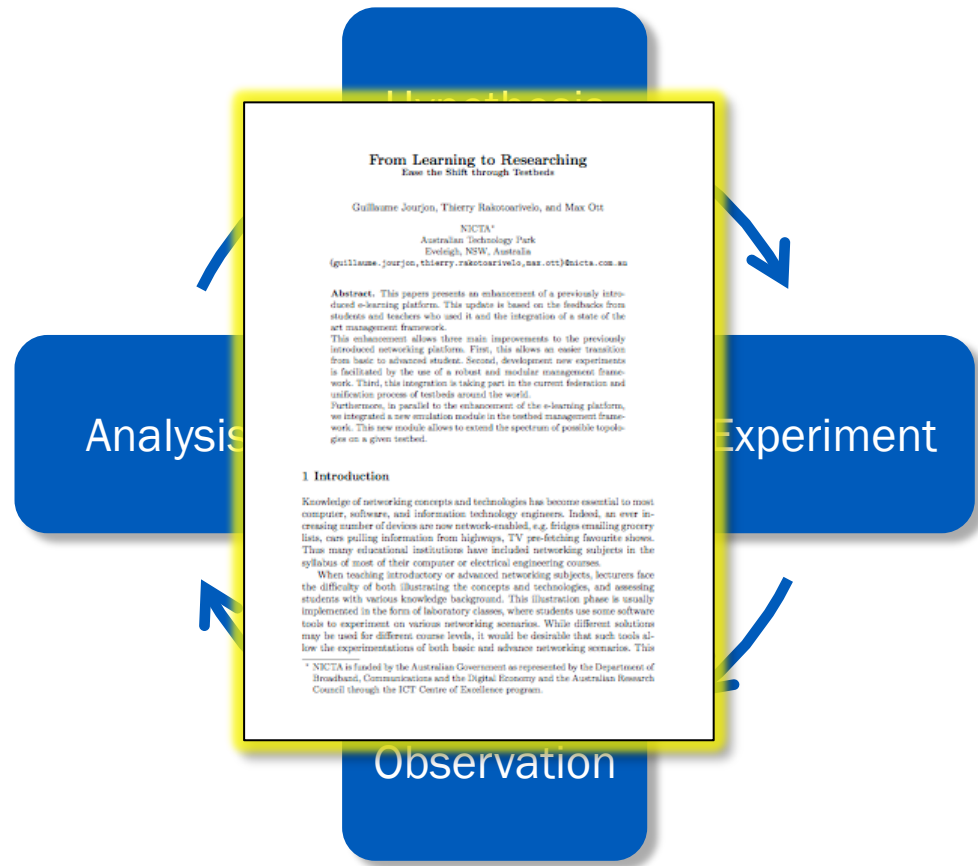




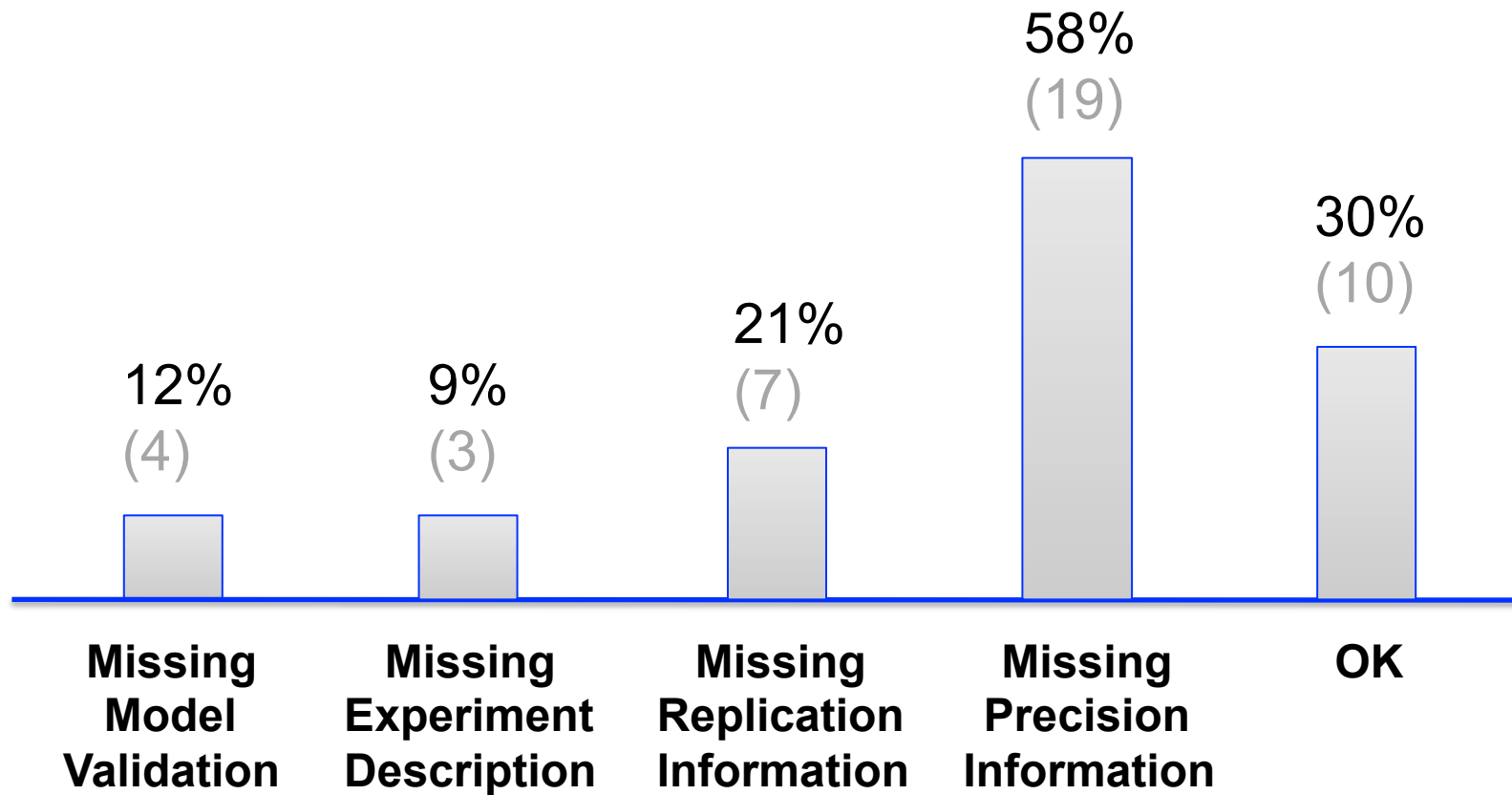








# How “well” do we do experiments today?

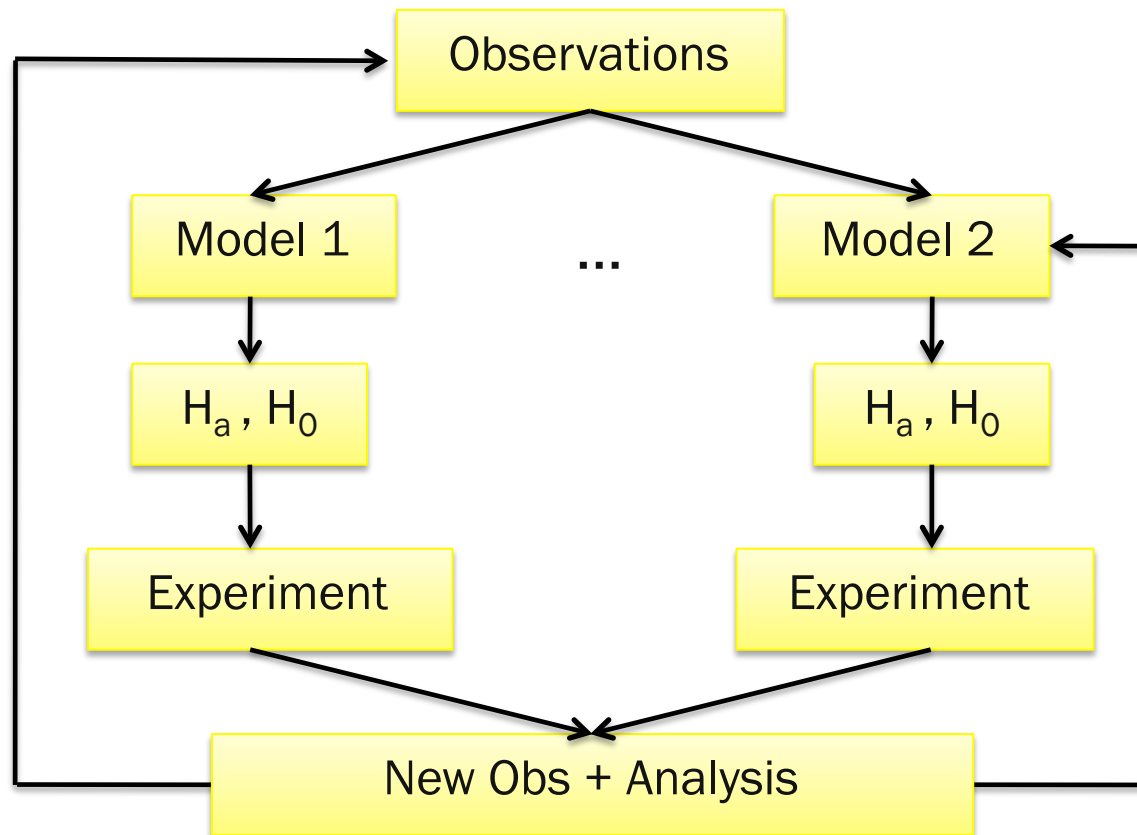


“Evaluation” section of SIGCOMM 2010 papers

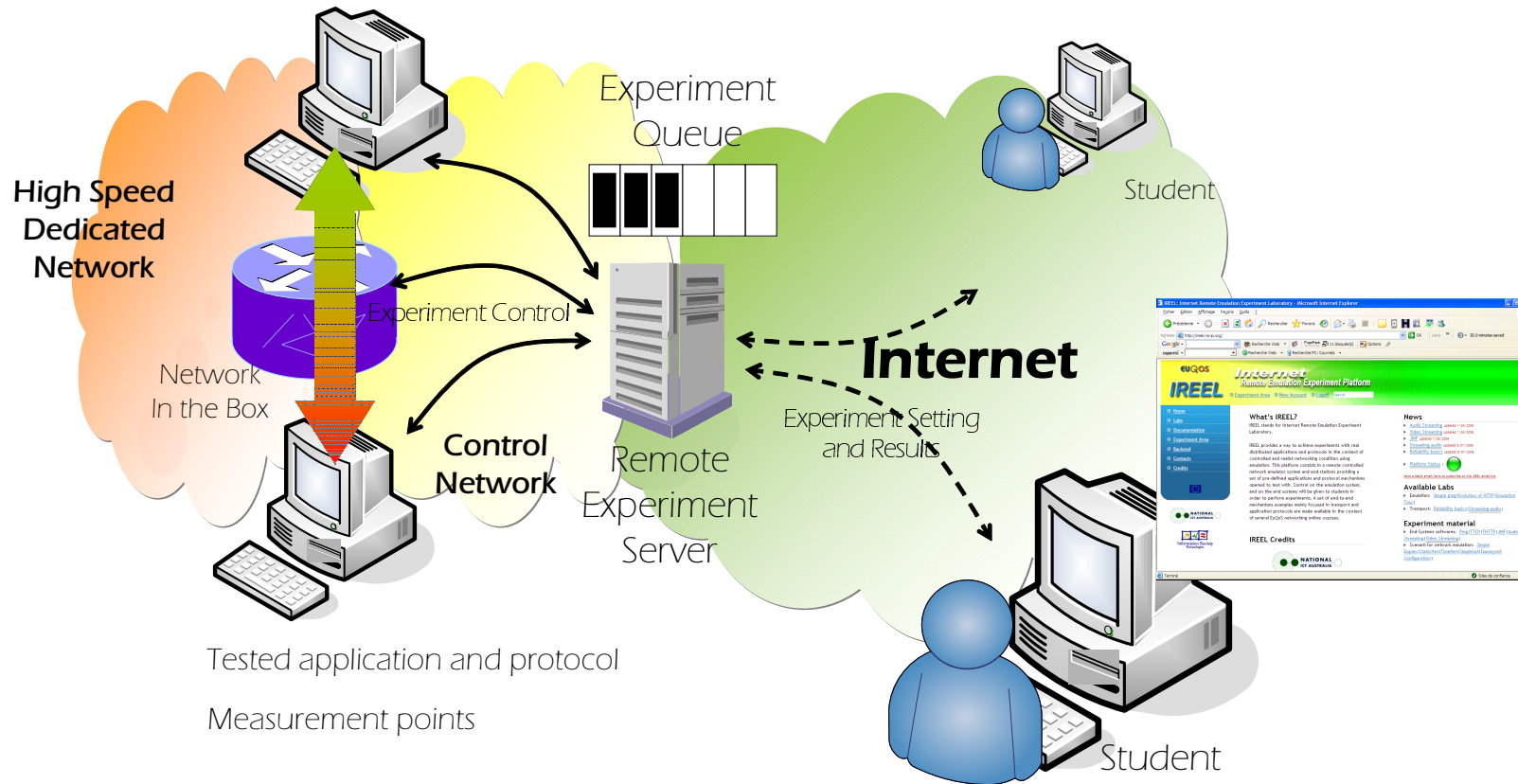
# How can we improve this?

- The Art & Science of Experimentation
  - The art of designing experiments
  - Scientifically sound methodology & analysis
- Dissemination
  - Overcoming the 6 page paper information barrier
- Learning
  - Reflection on the methodology
  - Developing Best Practices
- Tools
  - To streamline processes
  - To record processes and outcomes

# Need for Methodologies & Best Practices



# Need to teach Experimenting at Scale



[ireel.npc.nicta.com.au](http://ireel.npc.nicta.com.au)

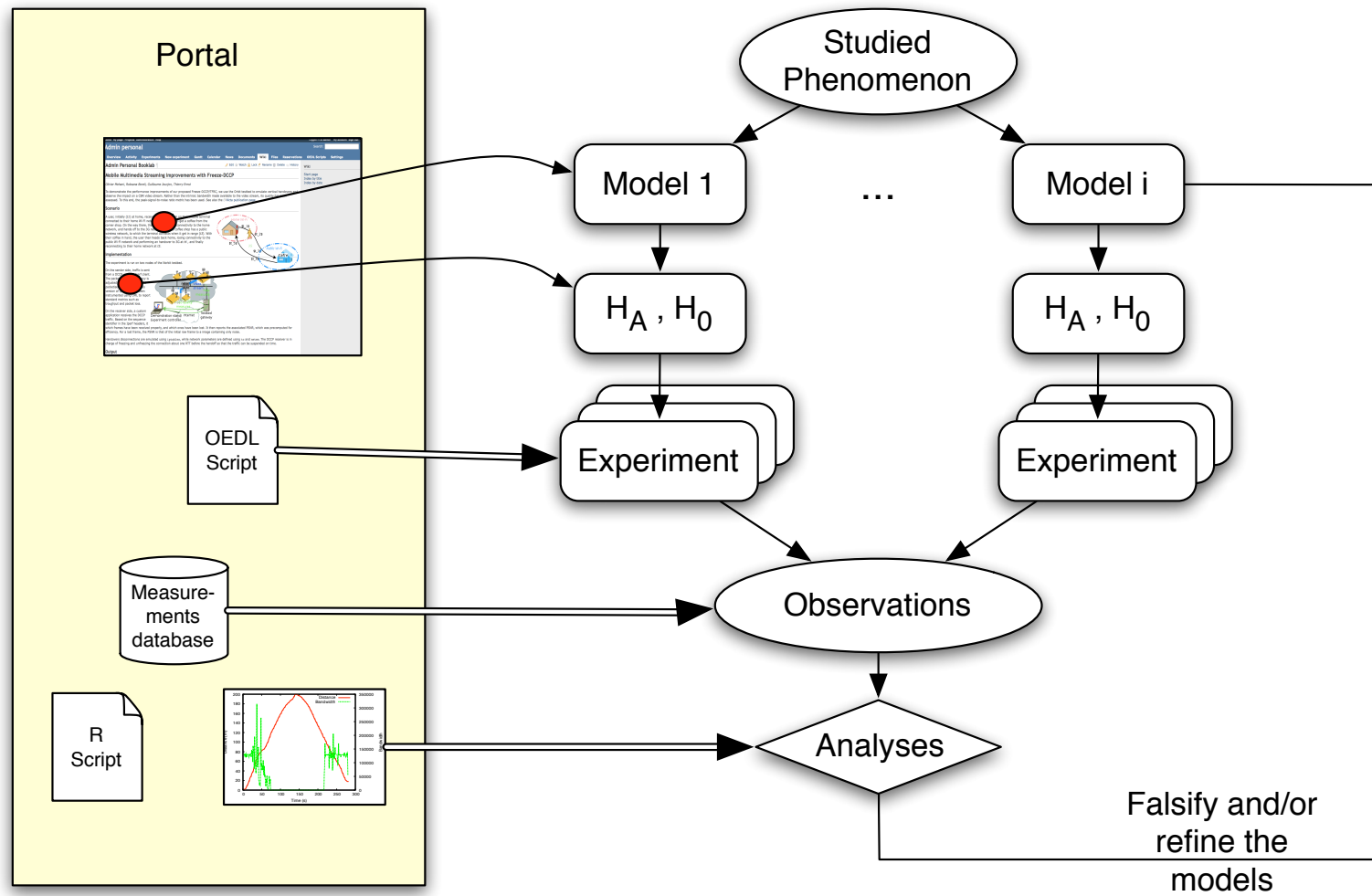
## Need new ways to disseminate Findings

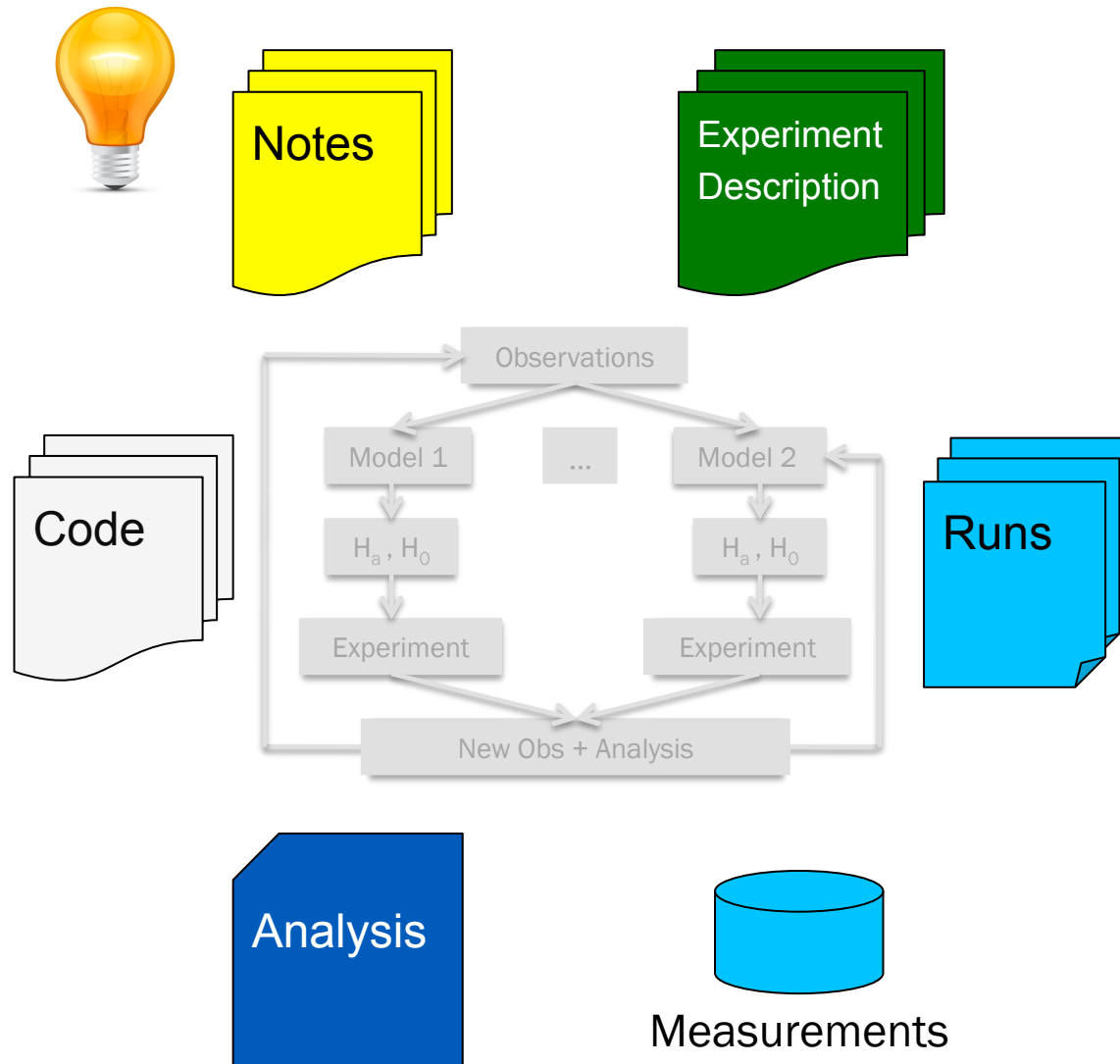
Authors are invited to submit Full Papers of up to 10 pages and Testbed Practices Papers of up to 6 pages, including references, figures and tables, formatted according to the IEEE conference format.

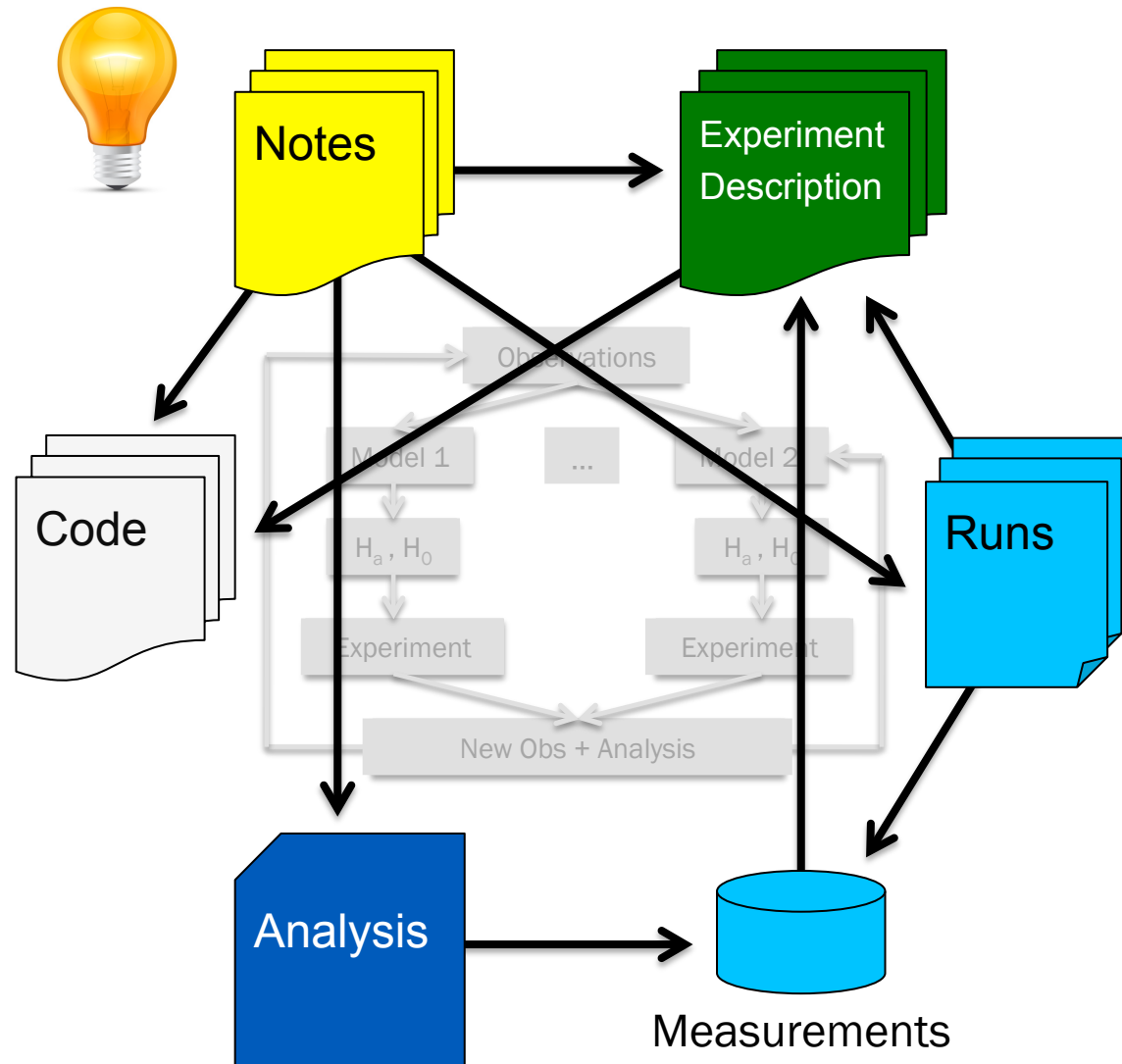


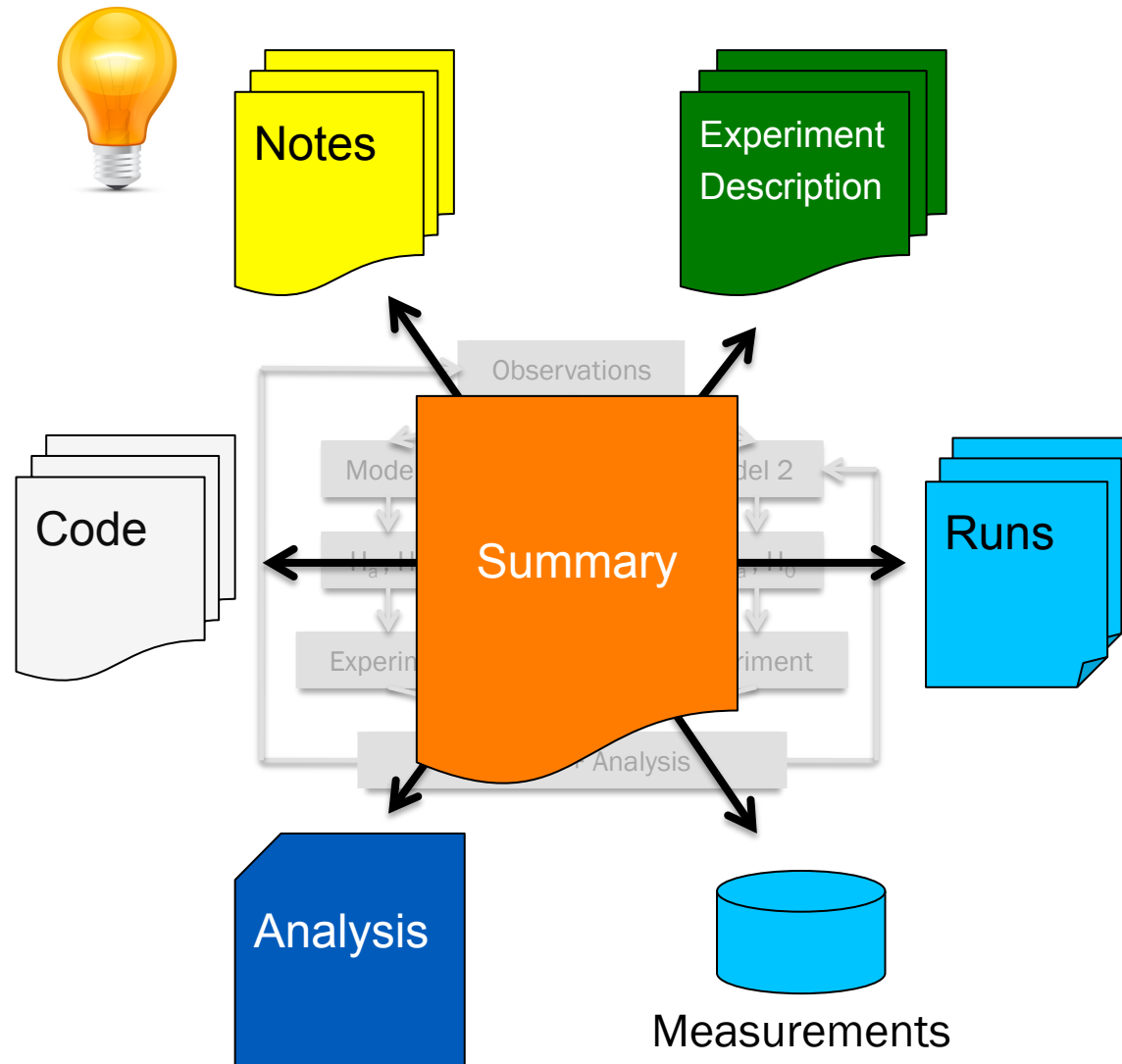


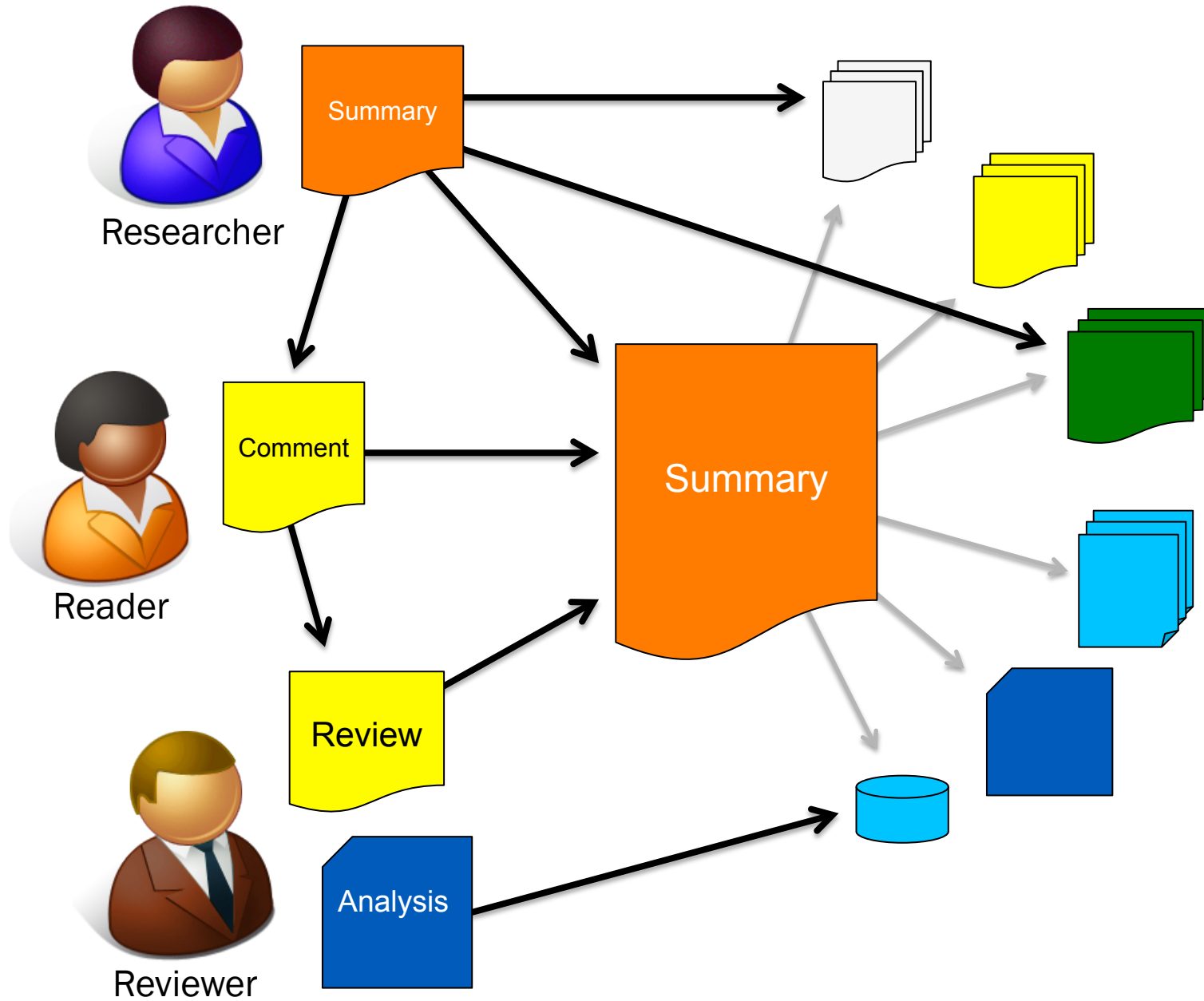
# LabWiki: Publishing Your Lab Book











# We are working on it

- OMF
  - OEDL to describe experiments
  - Experiment Controller to run them
- OML
  - Capture measurements & meta-data
- Portal
  - Wiki: Keep notes with references
  - Schedule & monitor runs
  - Analysis with integrated R server
  - Repository for all artifacts

# Admin personal

Overview Activity Experiments New experiment Gantt Calendar

## Admin Personal Booklab

### Mobile Multimedia Streaming Improvements with Free

Olivier Mehani, Roksana Borell, Guillaume Jourjon, Thierry Ernst

To demonstrate the performance improvements of our proposed Freeze-DCCP/TFRC observe the impact on a CBR video stream. Rather than the intrinsic bandwidth ma assessed. To this end, the peak-signal-to-noise ratio metric has been used. See als

#### Scenario

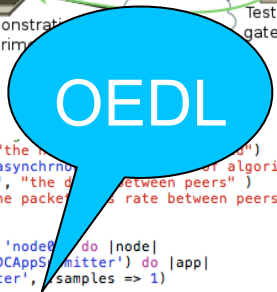
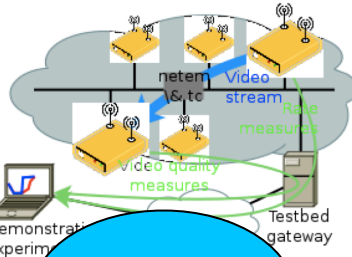
A user, initially ( $t1$ ) at home mobile terminal connected to their home Wi-Fi network. On the way to the corner shop. On the way the user's mobile terminal moves to the public wireless network, to which the user's mobile terminal get in range ( $t3$ ). With their coffee in hand, the user then moves back home, losing connectivity to the public Wi-Fi network and performing a handover to 3G at  $t4$ , and finally reconnecting to their home network at  $t5$ .

#### Implementation

The experiment is run on two nodes of the Norbit testbed.

On the sender side, traffic is sent from a DCCP-enabled Iperf client. The packet size and frequency is adjusted to match those of the packetised video stream. This version of Iperf has also been instrumented using OML to report standard metrics such as throughput and packet loss.

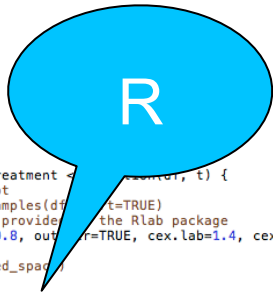
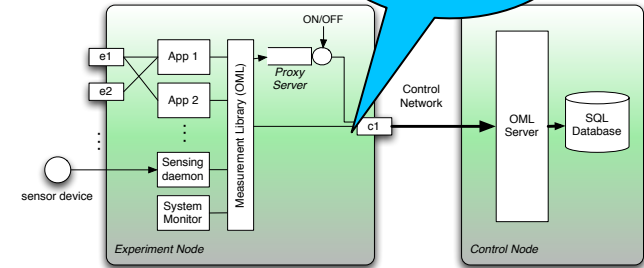
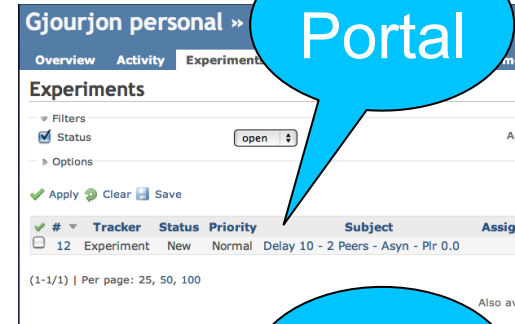
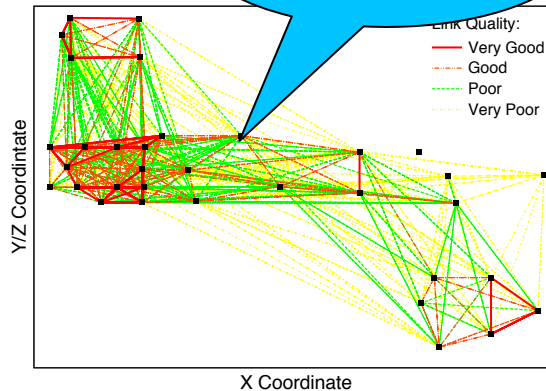
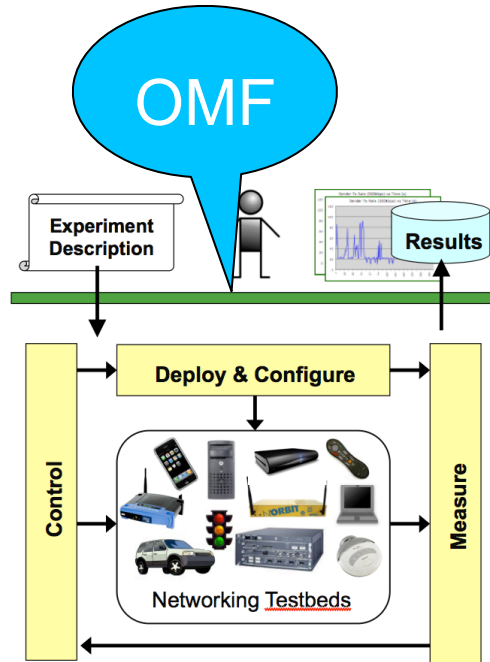
On the receiver side, a custom application receives the DCCP traffic. Based on the sequence identifier in the Tnrf headers it



```
defProperty('nbPeers', 2, "the number of peers to use")
defProperty('classAlgo', 'asynchronous', "the class of algorithm to use")
defProperty('delay', '10ms', "the delay between peers")
defProperty('plr', 0.0, "the packet loss rate between peers")

# Coordinator
defGroup('submitterGroup', 'node0' do |node|
  node.addApplication('P2PDCAppSubmitter') do |app|
    app.measure('mp_submitter', :samples => 1)
  end
end

# Computing Peers
defGroup('donorGroup', "[[node1..node#{nbPeers}]]" do |node|
  node.addApplication('P2PDCAppDonor') do |app|
    app.measure('mp_worker_result', :samples => 1)
    app.measure('mp_worker_diff', :samples => 1)
  end
end
end
end
# T--1-----
```



```
boxplot.throughput.treatment <- function(df, t) {
  # Plot the boxplot
  # boxplot(group.samples(df, t), las=TRUE)
  # Or use 'bplot' provided by the Rlab package
  bplot(df, space=0.8, out.lab=TRUE, cex.lab=1.4, cex.axis=
  title(t)
  #return(df_grouped_spac
}

boxplot.throughput.treatment.space <- function(df) {
  boxplot.throughput.treatment(group.samples.space(df),
  "Throughput samples for all treatments (paired by
}
```

# Call to Action

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  - There need to be better ways than 10 page papers
- Learning
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