COSMOS/ORBIT Tutorials (Introduction)
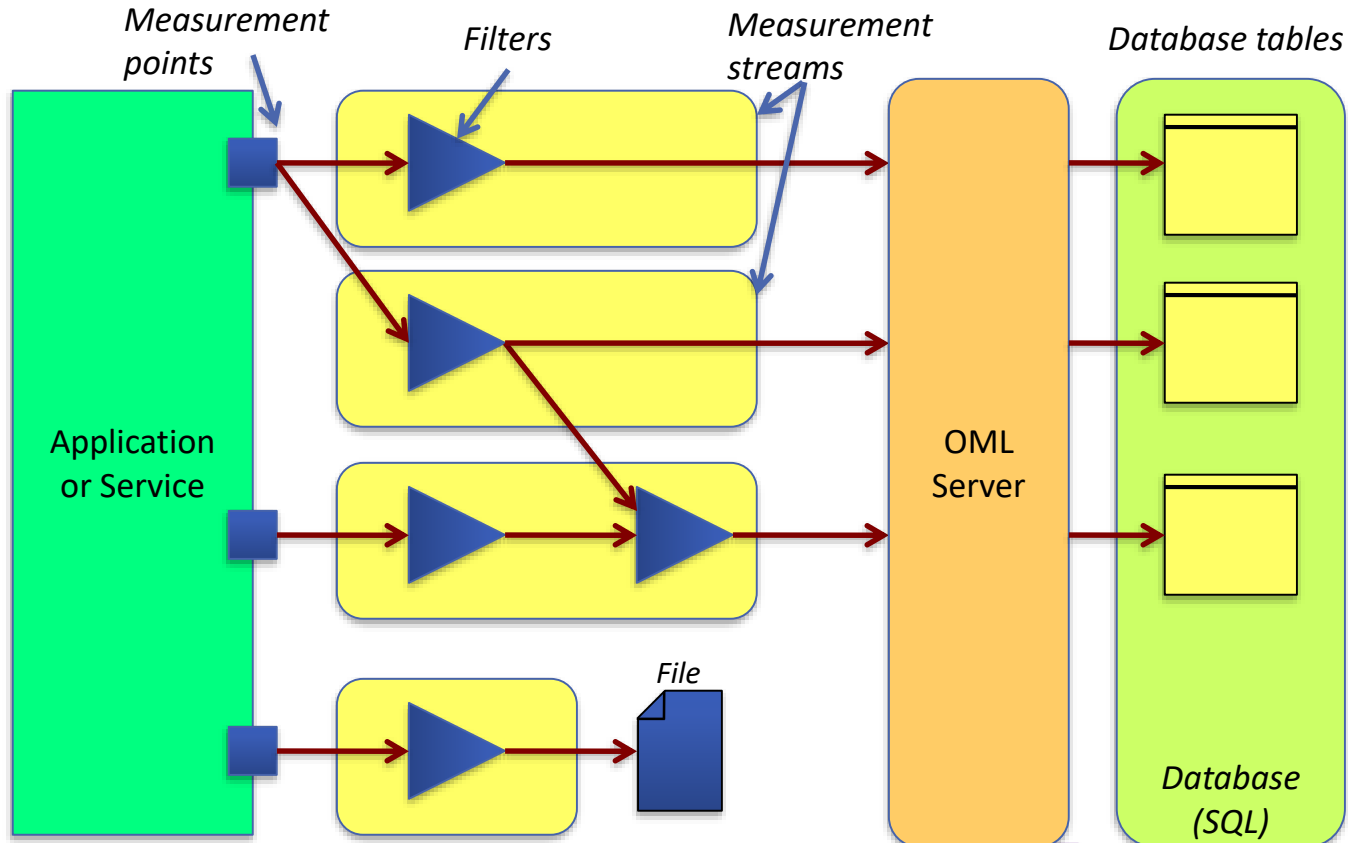
Orbit Measurement Library (OML)

- Hardware with (at least one) dedicated NIC for control/instrumentation

- Experimenters measure node, network & application performance (i.e. a lot of numbers).

- How to collect these numbers in real-time, in a distributed environment like ORBIT?

> OML design goal: distributed software infrastructure to collect measurements in real-time while providing flexible (and dynamic) way to modify the collection process.
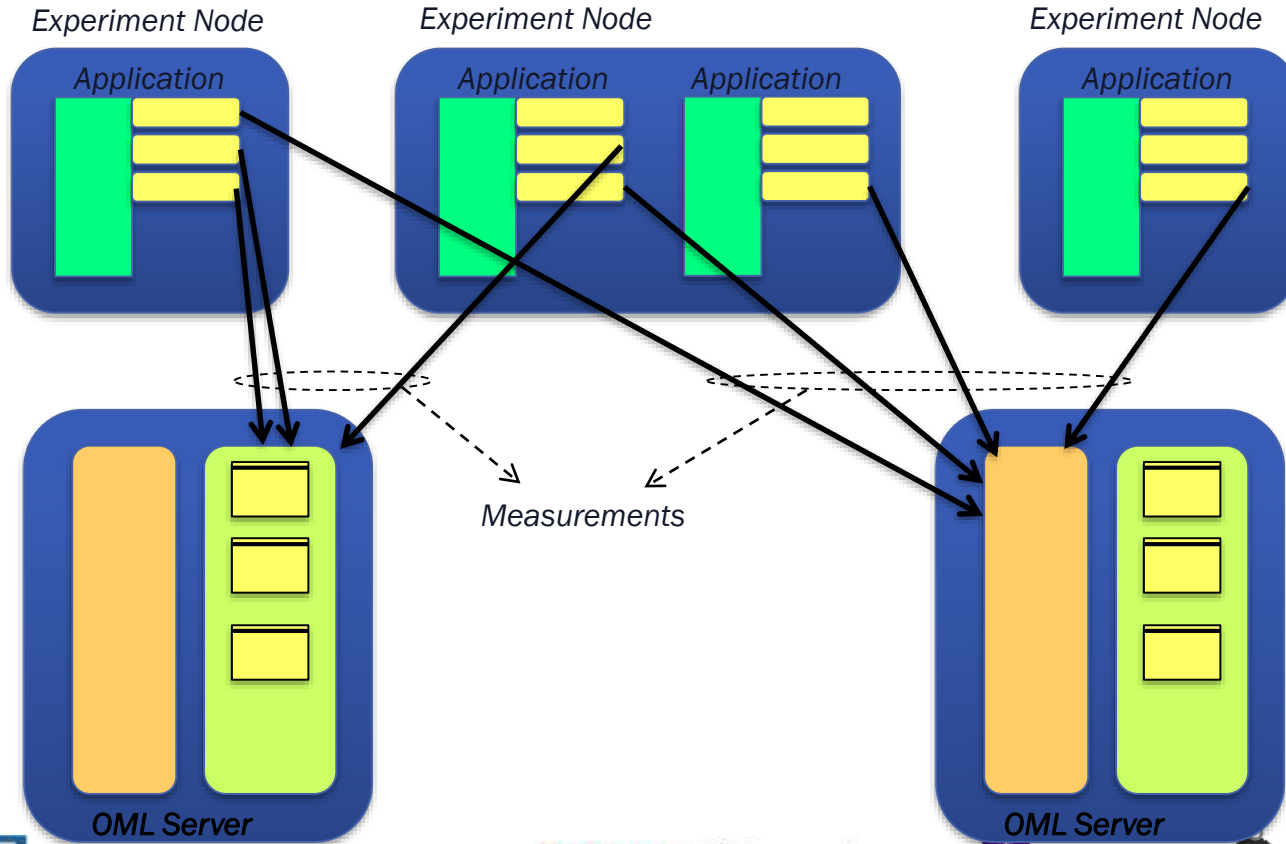
Orbit Measurement Library (OML) (2)

- Push based architecture
- All experiment data in one place – including metadata
- Separation of concerns
  - Instrumentation
  - Collection
- Minimize collection overhead
  - Application CPU time
  - Experimental traffic interference
- Proxy server for disconnected operation

OML Client + Server

OML – Measurement Collection

Experimental Support

Applications

- 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

OML2 Functions

- **omlc_init()** – used for OML initialization
  omlc_init(arg(0), &argc, argv, o_log);

- **oml_add_mp()** – called to register each measurement point with the container
  oml_mp = omlc_add_mp("udp_out", oml_def);

- **omlc_start()** - used to start the local collection daemon

- **omlc_process()** – used to specify the stages at which to collect the measurement points
  omlc_process(oml_mp, v);

SS Tutorial

COSMOS Summary

- Focus on ultra high bandwidth, low latency, edge cloud
- Open platform (building on ORBIT) integrating mmWave, SDR, and optical x-haul
- 1 sq mile densely populated area in West Harlem
- Local community outreach
- Research community:
  - Develop future experiments, provide input
  - (short term) get involved in the educational outreach

More information:

http://advancewireless.org   http://www.orbit-lab.org   http://www.cosmos-lab.org
http://omf.orbit-lab.org   http://oml-doc.orbit-lab.org