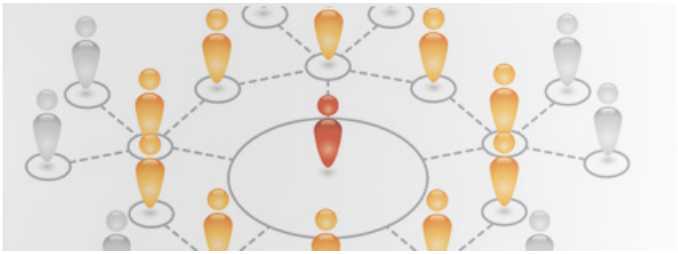


Measurements on Layer 2 and OpenFlow Paths

Prasad Calyam, Ph.D.

I&M Working Session for GEC13

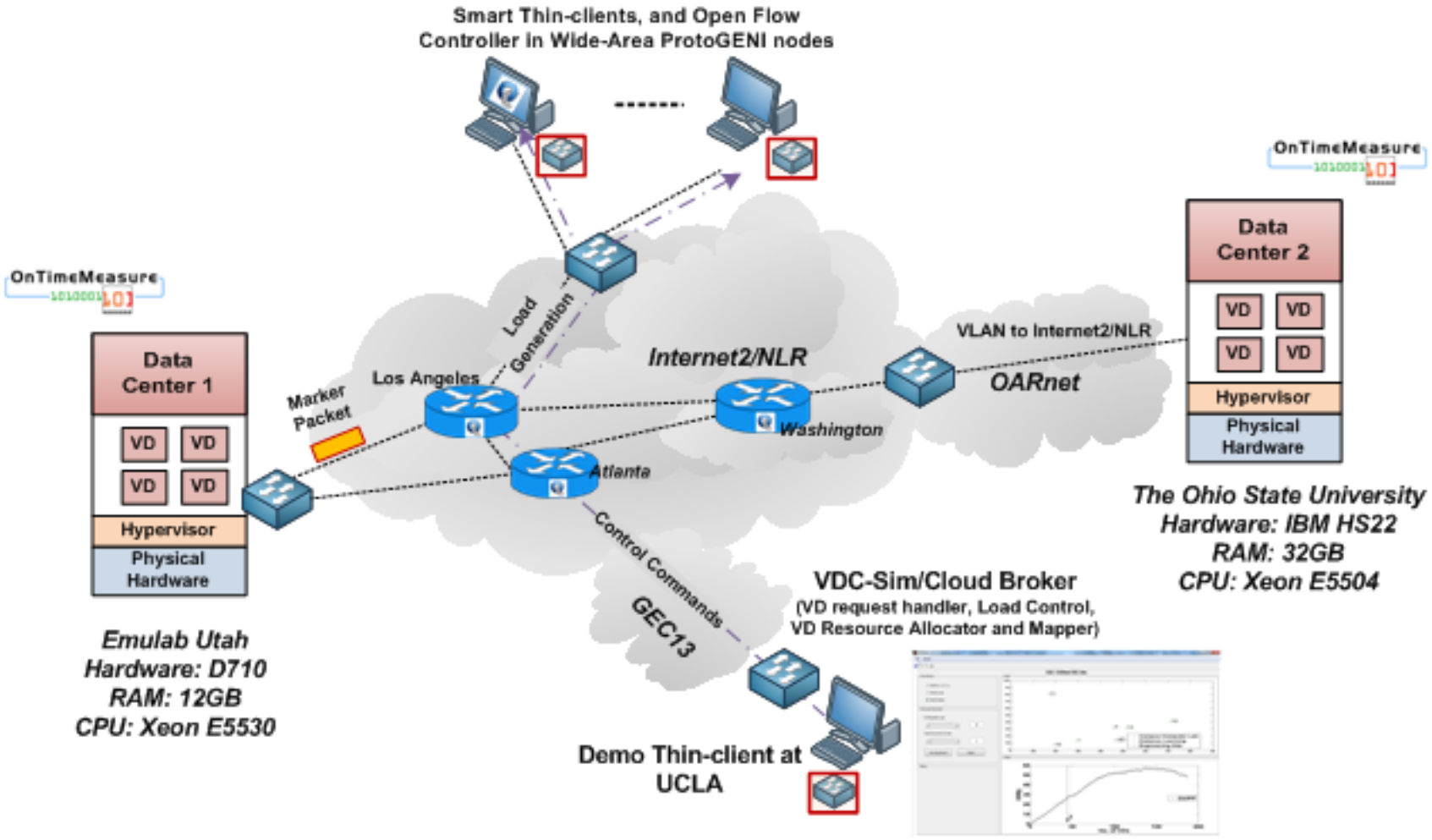
March 13th 2012

New Challenges in GENI I&M

- Developing a design for “infrastructure measurement slices” in GENI
  - Collaboration with the PerfSONAR/LAMP project team
  - Building upon “Reference Slice” experiences of Ali Sydney & Harry Mussman
  - Building upon meso-scale monitoring discussions

- Conducting experiments on:
  (i) Monitoring GENI backbone and access networks carrying non-IP traffic
  (ii) Monitoring of OpenFlow networks (“plastic slices”)
  - Evaluating specialized tools for VLAN and OpenFlow performance monitoring
  - Using “OSU VMLab – Utah Emulab” VLAN as a testbed for experiments
    - End-to-end Path: OSU – OARnet – Internet2/NLR Meso-scale Backbone – Utah

OSU VMLab – Utah Emulab Testbed



Some thoughts…

- Main monitoring objectives from “experimenter” perspective
  - Connectivity or topology verification
  - Performance or resource allocation verification
- Metrics of interest
  - Hop level, Path level, Slice level
  - OpenFlow controller application (e.g., VDC) metrics
- Multi-domain measurement federation assumption
  - E2E Tools: Ping, Slice/L2 traceroute, Iperf, …
  - Packet captures at intermediate and end hosts
- Alerting
  - Notifications of unexpected events
    - 2 cases discussed in GEC12: uncontrolled VLAN bridging or traffic leaks between VLANs, MAC addresses getting shared between experiments
  - Up/Down, Threshold crossing/change detection notifications
    - Nagios, Custom red/green dashboards

Thank you for your attention!