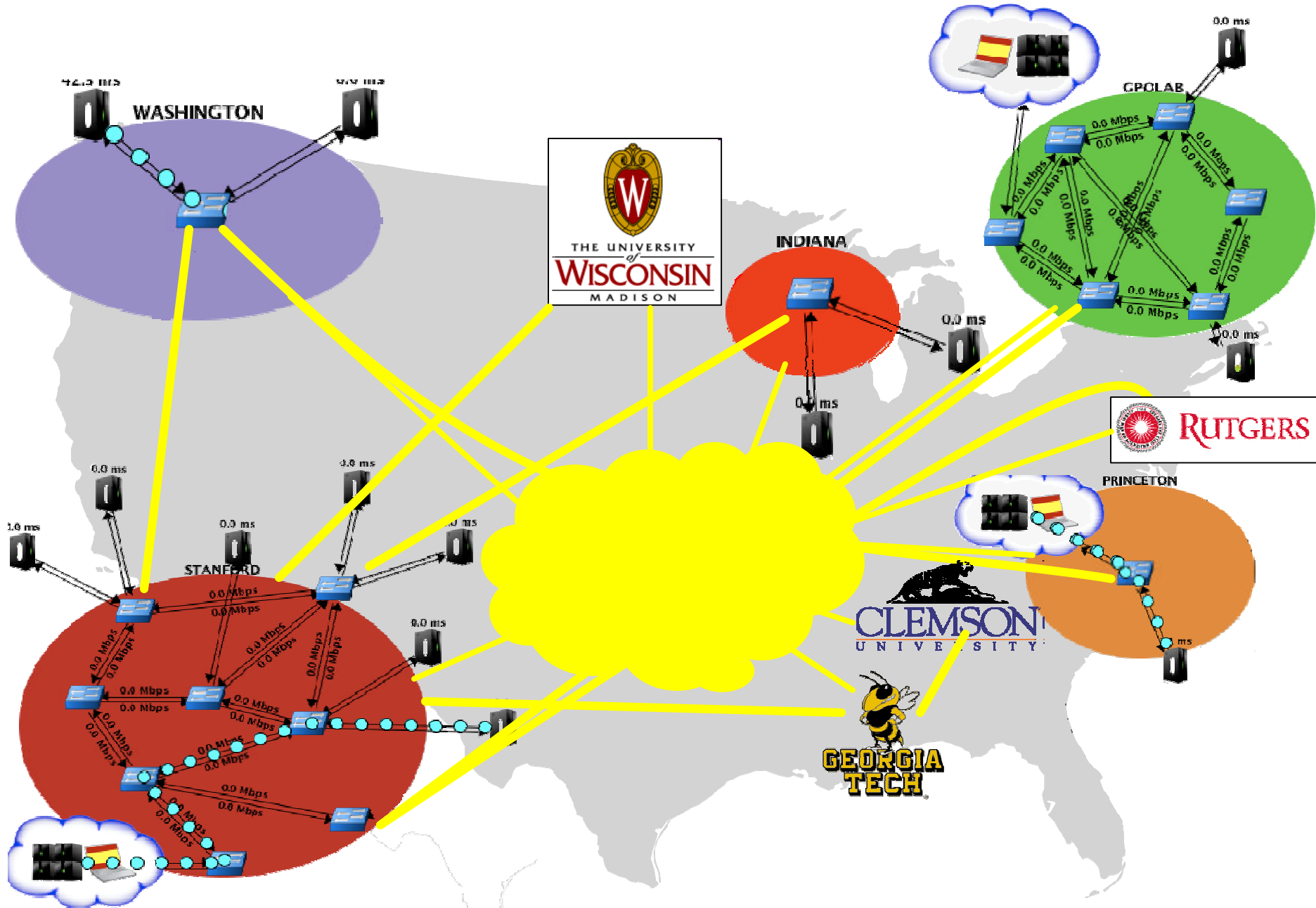


OpenFlow Campus Trials Update

GEC8

July 2010

Network today and tomorrow...



Goals

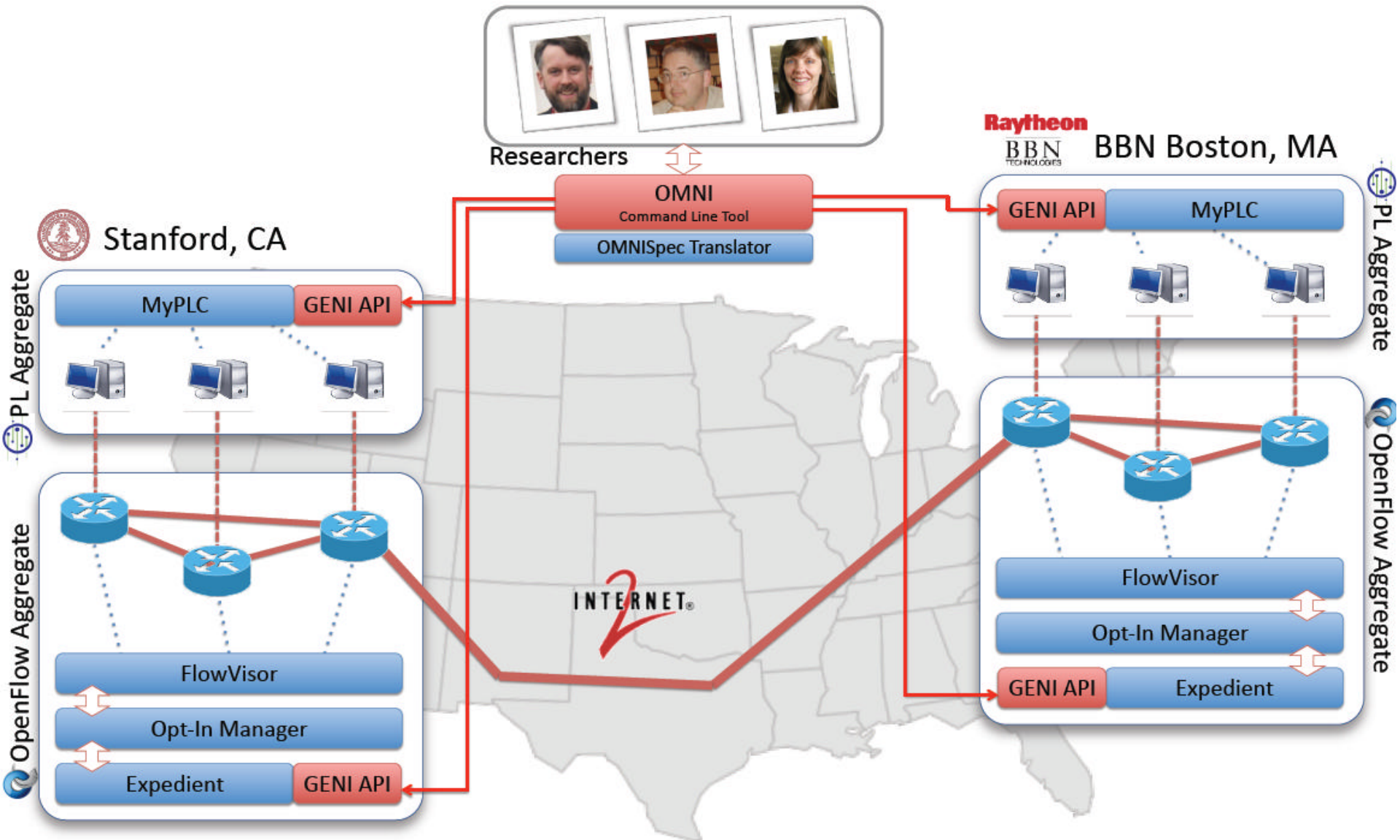
The high-level goal is to build infrastructure and use it effectively for GEC9 demos

- Broaden production deployment
 - Challenges:
 - Transition to 1.0
 - Scale
 - Opt-in/migrate users
- Successful demos at GEC9

Support for GEC9: Outline

- Software List and Release plan
- Basic Functionalities for GEC9
- TODOs

Experiments over Multiple Aggregates



List of Software

OpenFlow ref. implementation	git://openflowswitch.org/openflow.git http://openvswitch.org/git/openvswitch	1.0
NOX controller w/ LAVI support	git://noxrepo.org/noxcore (Branch TBD)	0.4
ENVI	git://github.com/dound/envi.git	-
SNAC	http://github.com/bigswitch/snac-nox.git http://github.com/bigswitch/snac.git	(Next ppt)
FlowVisor	git://openflowswitch.org/flowvisor.git	0.6
Expedient, Opt-in mgr	git://openflow.org/expedient (VM at http://www.openflow.org/wk/index.php/VM_instructions)	TBD
HP, NEC, Toroki, and Pronto firmware	Vendor distribution mode	HP: 2_02h NEC: 278 Indigo_beta

Support Overview

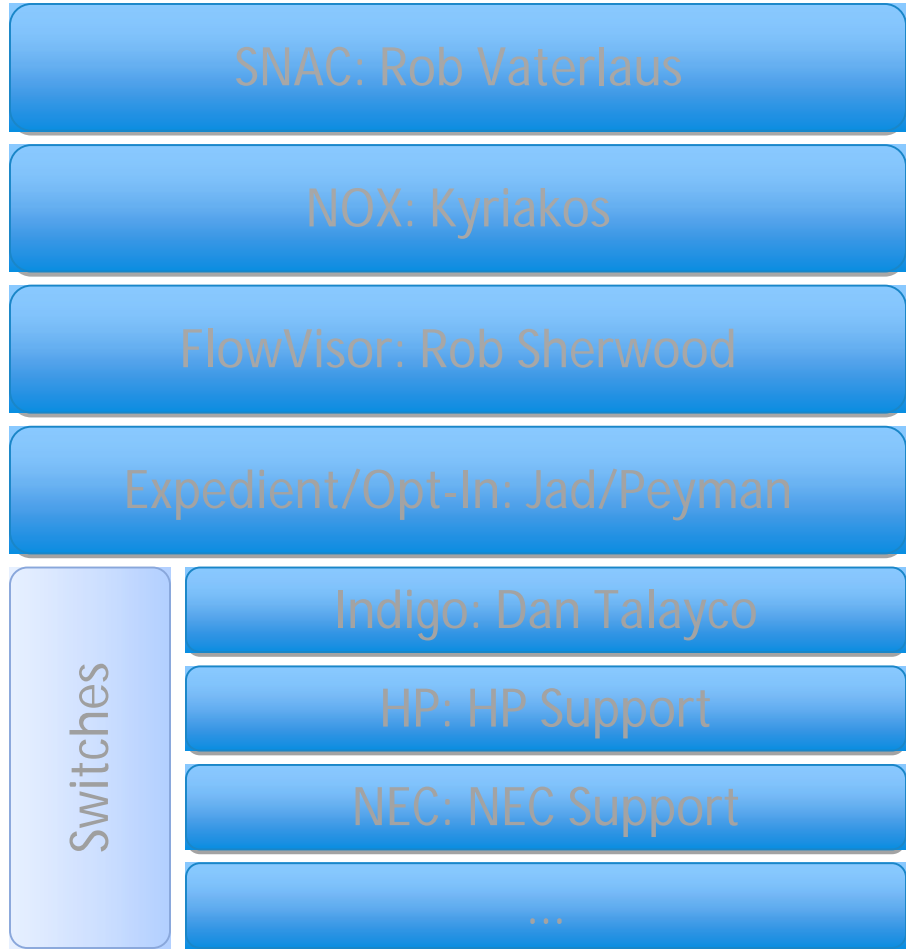
Level 1

Local Campus IT

Level 2

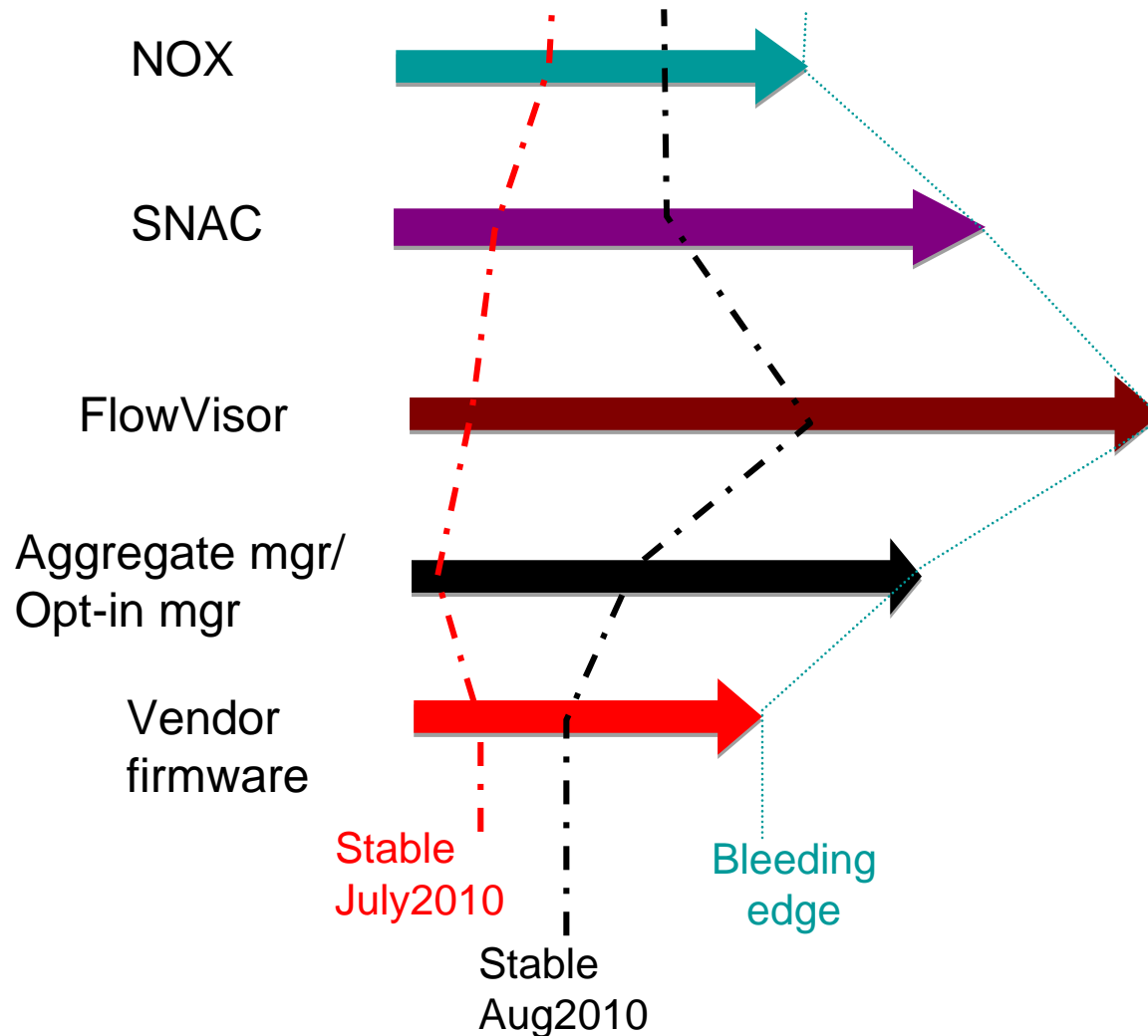
General OpenFlow Support:
Johan, Paul
Masayoshi and Srini

Level 3



Typical Scenario

- Different snapshots in the revision of each software



Release Plan: Stanford, Berkeley, Bigswitch

- The deployment team will tag the revision of each software that is considered “stable”:
 - 1st week of each month
 - Condition: works fine in a deployed network
- Each campus can download either the:
 - Tagged stable release (recommended), or
 - HEAD of the software branch with bug fixes and feature enhancements (termed “Bleeding edge”)
- For demo coordination, each cooperating campus should run same revision of software

Release plan: Vendors

- Stanford deployment team will publish which vendors' firmware release is considered stable
 - 1st week of each month
 - For each switch platform
 - In coordination with other software releases
- Firmware releases follow vendor release plans – independent of Stanford software
 - It is possible that we will wait for new firmware release before progressing “stable” tag
- Stanford recommendations are for tested, stable, deployable versions

Basic Functionalities for GEC9

- Slicing using FlowVisor
 - Shown in GEC8
- Support for bandwidth slicing and queues in firmware and controller
 - Yet to be tested on a large scale
- Federation across aggregates
 - Limited version shown in GEC8
- Integrated GENI control framework to manage end-to-end slices
 - Limited version shown in GEC8

GEC9 TODOs

- Month 1 and 2: Infrastructure
 - Interconnection
 - Internet2/NLR will have OpenFlow switches
 - Campuses connect and get e2e working
 - Deployment/testing of GENI control framework
 - All campuses
 - Opt-in of production users on all campuses
 - Including PlanetLab and ProtoGENI nodes

GEC9 TODOs (contd.)

- Month 3 and 4
 - Tech support for other campuses (e.g., Columbia)
 - Trial runs, testing, debugging
 - Polishing demos

Open Questions

- How do we divide network resources for GEC9?
 - Flow table entries, VLANs, rate of stats requests, rate of software msgs, bandwidth, experimenter limits enforced at FlowVisor(s)/Expedient
- Will GEC9 demo coexist with production, or isolated demo network?
 - Latter case for GEC8