UNIVERSITY of WASHINGTON

OpenFlow Deployment

GENI CIO Workshop, Boston, MA
July 12, 2012

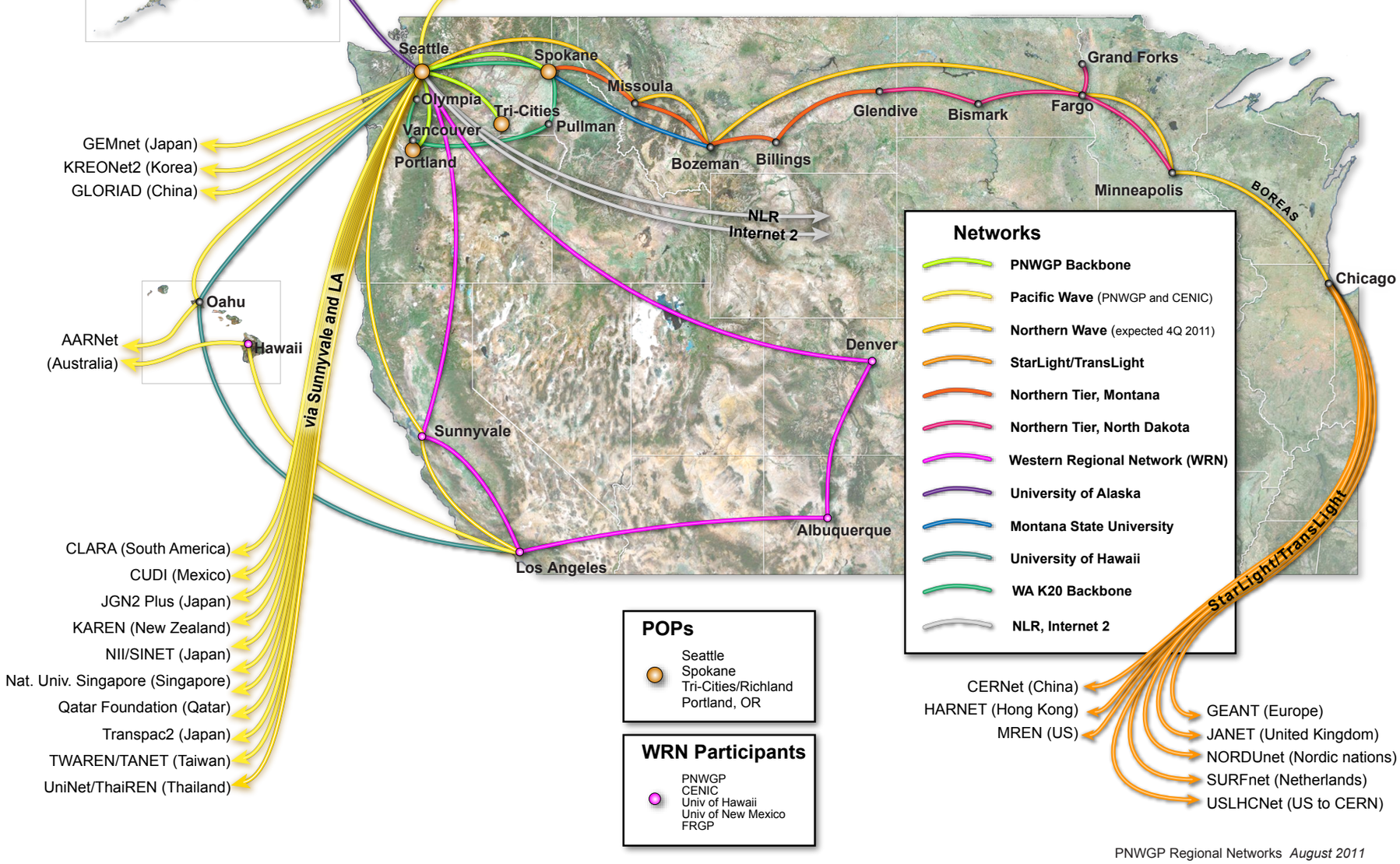
150 YEARS W

UW Networks

- Campus Network
  - –235,000+ Ethernet Ports
  - –6,700+ Wireless APs
- Support Diverse Community
  - –Undergraduate Education
    - 36,000 undergraduates
  - –Research
    - $1.4 billion in federal research funding
  - –Healthcare
    - Operate Four Hospitals

PNWGP and Regional Partner Networks

PACIFIC NORTHWEST GIGAPOP



Networks

- PNWGP Backbone
- Pacific Wave (PNWGP and CENIC)
- Northern Wave (expected 4Q 2011)
- StarLight/TransLight
- Northern Tier, Montana
- Northern Tier, North Dakota
- Western Regional Network (WRN)
- University of Alaska
- Montana State University
- University of Hawaii
- WA K20 Backbone
- NLR, Internet 2

POPs

Seattle
Spokane
Tri-Cities/Richland
Portland, OR

WRN Participants

PNWGP
CENIC
Univ of Hawaii
Univ of New Mexico
FRGP

PNWGP Regional Networks *August 2011*

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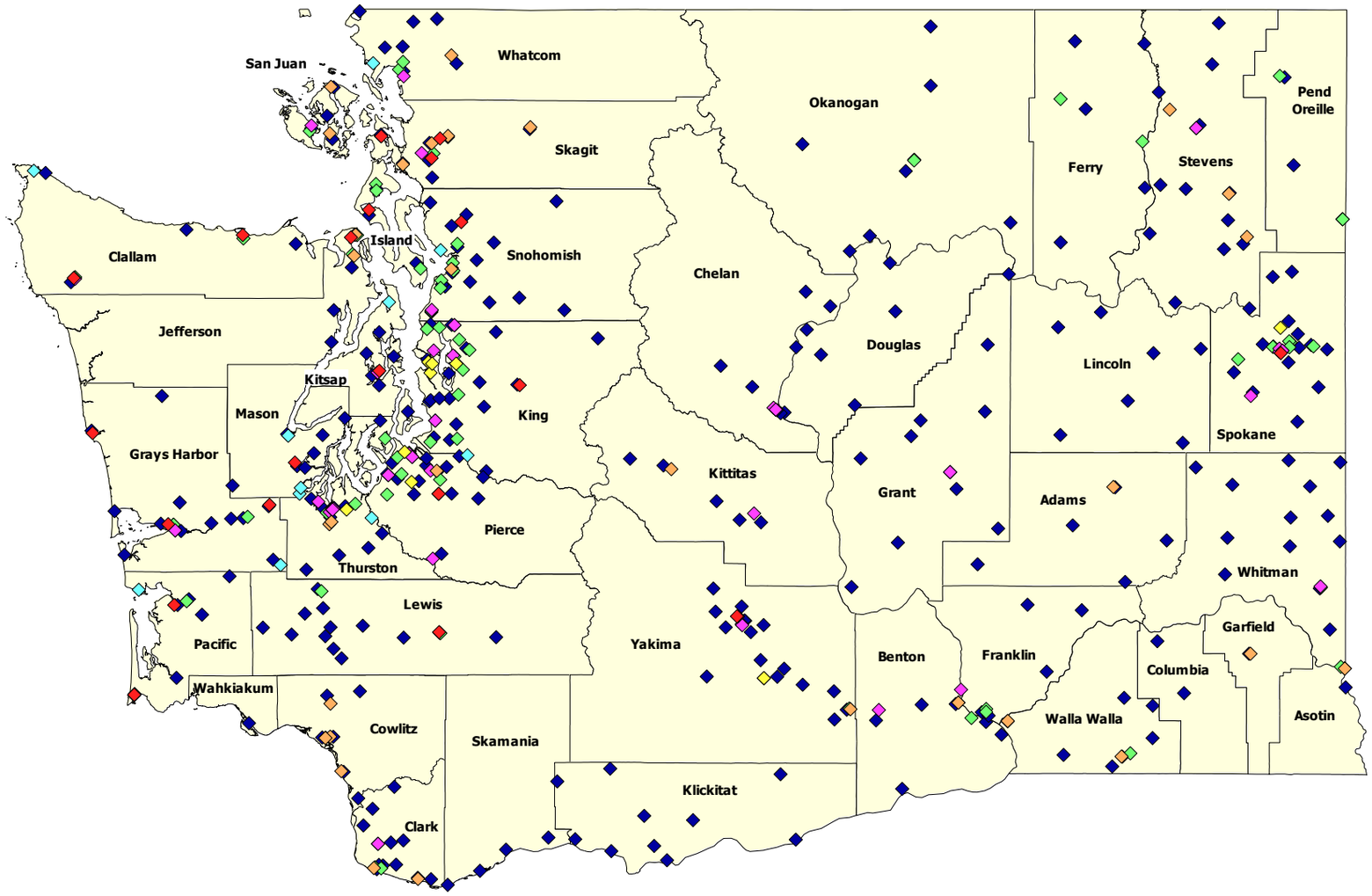
K-20 Education Network

497 Sites Connected Directly to K-20



- K-12 District/ESD (306)
- Community/Technical College (76)
- Public College/ University (43)
- Public Library (30)
- Telemedicine Site (22)
- Tribal Education Center/ Tribal College (11)
- Independent College/ University (9)

150 YEARS W

Software Defined Networking

- SDN and OpenFlow
  - –Provides an API into the network control plane
  - –Allows novel protocol development on existing hardware
  - –Potential to easily port mature experiments out of the lab into a production environment

Potential IT Application: Bonjour

- Bonjour is a widely used discovery protocol
- Works well for users at home and small business
- Presents significant challenges scaling to enterprise
- Some vendors are offering proprietary solutions
- With OpenFlow could potentially intercept Bonjour traffic and reroute traffic based on intelligence in the network so it reaches appropriate users

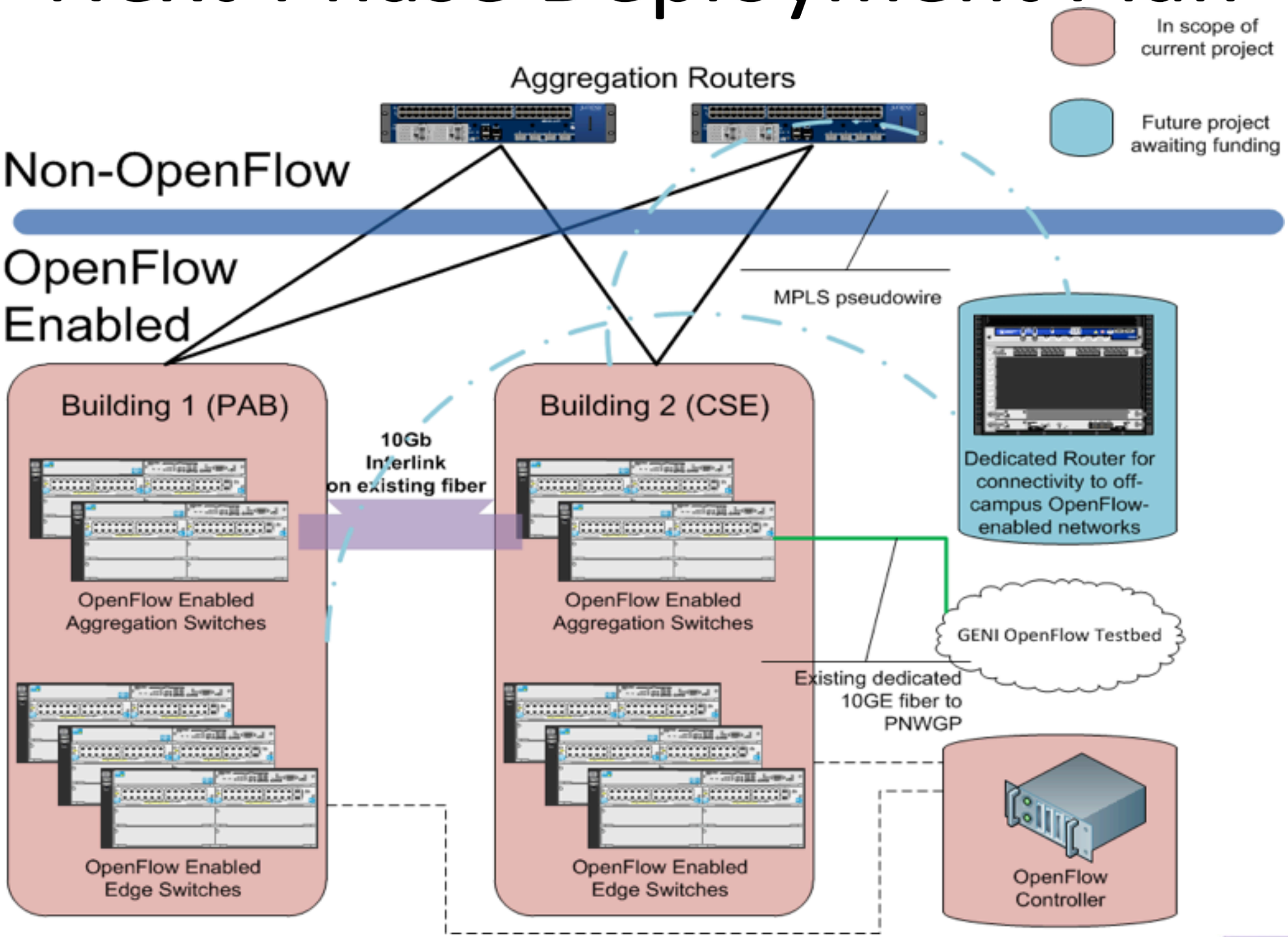
UW Deployment

- Small deployment managed by Computer Science and Engineering Department
- Deployment connected via dedicated fiber to Pacific Northwest GigaPOP to enable collaboration at the mesoscale

Next-Phase Deployment Plan

- Add OpenFlow enabled switches in additional locations within our campus
  - Enables experiments to be conducted involving more users and more complex topologies
- Engaging campus central IT
  - Leverage existing physical infrastructure (fiber, etc.,)
- Keep OpenFlow network segmented to minimize risk of impacting production network
  - Allow experimenters to experiment, break things

Next-Phase Deployment Plan



Challenges

- Central management of OpenFlow
  - –OpenFlow Controllers, FlowVisor still maturing
  - –Researchers may want to write their own controller
  - –How to coordinate resources among multiple researchers

Questions?