

OpenFlow Deployment Planning

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Information Technology*

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Introduction

Software Defined Networking (SDN) and OpenFlow provide a platform for researchers to perform experiments at any level of the network with the potential to leverage production traffic flows. In the past networking research has largely been limited to software emulation, as commodity network hardware has been closed to development. OpenFlow creates a multitude of opportunities for research into both next generation networking protocols as well as paradigm shifts in how networks are managed.

University of Washington Information Technology (UW-IT) partners with the UW community to support innovation, discovery and outreach and is responsible for strategic oversight, planning and direction of the University's IT infrastructure, resources, and services. UW-IT is committed to supporting research into future network protocols on campus. Previous efforts within central IT have focused on providing access to national OpenFlow test-beds via dedicated Layer 2 paths, leveraging UW-IT's close partnership with the Pacific Northwest Gigapop. UW-IT plans to initiate a pilot program to directly support OpenFlow and Software Defined Networking (SDN) within the IT organization and on campus.

Background

University of Washington researchers have been involved in OpenFlow since its early phases. The UW Department of Computer Science and Engineering is one of the original nine university OpenFlow deployments sponsored by the National Science Foundation through GENI, with equipment deployed locally within the Paul G. Allen Center for Computer Science and Engineering and managed by the department's staff and researchers. This testbed enabled several research projects including a decentralized network manager (ETTM) and an access control mechanism for network resources in the cloud (CloudPolice).

UW-IT has also raised OpenFlow capability as an important component in discussions with switch and software vendors, including meetings focused around OpenFlow support with vendors including Arista, Big Switch Networks, Brocade, Cisco, Extreme, IBM, and Juniper.

Central IT Support

Close involvement in managing the OpenFlow network from UW-IT will bring additional operational support experience and resources to the campus OpenFlow environment. The additional resources and experience of the central IT organization will allow the footprint of the OpenFlow network to expand across the University's campus to additional buildings, providing more researchers access to the platform as well as the

potential to run experiments across more varied topologies with a larger base of user traffic.

Opportunities

The University of Washington works in close partnership with the Pacific Northwest Gigapop and the Washington State K-20 Education Network. The ability to provide OpenFlow capability within or through these regional networks may offer additional platforms for research and experimentation.

Deployment Plans

Figure 1 shows the proposed deployment of OpenFlow-enabled switches to the Physics and Astronomy Building (PAB) and the Paul G. Allen Center for Computer Science & Engineering at the University of Washington (CSE). The OpenFlow switches will have connections both to the regular campus data network for traditional external access as well as an OpenFlow enabled router, used to participate in inter-domain OpenFlow testing. The OpenFlow-enabled router would connect to the proposed OpenFlow-enabled switch infrastructures in CSE and PAB via MPLS pseudowires.

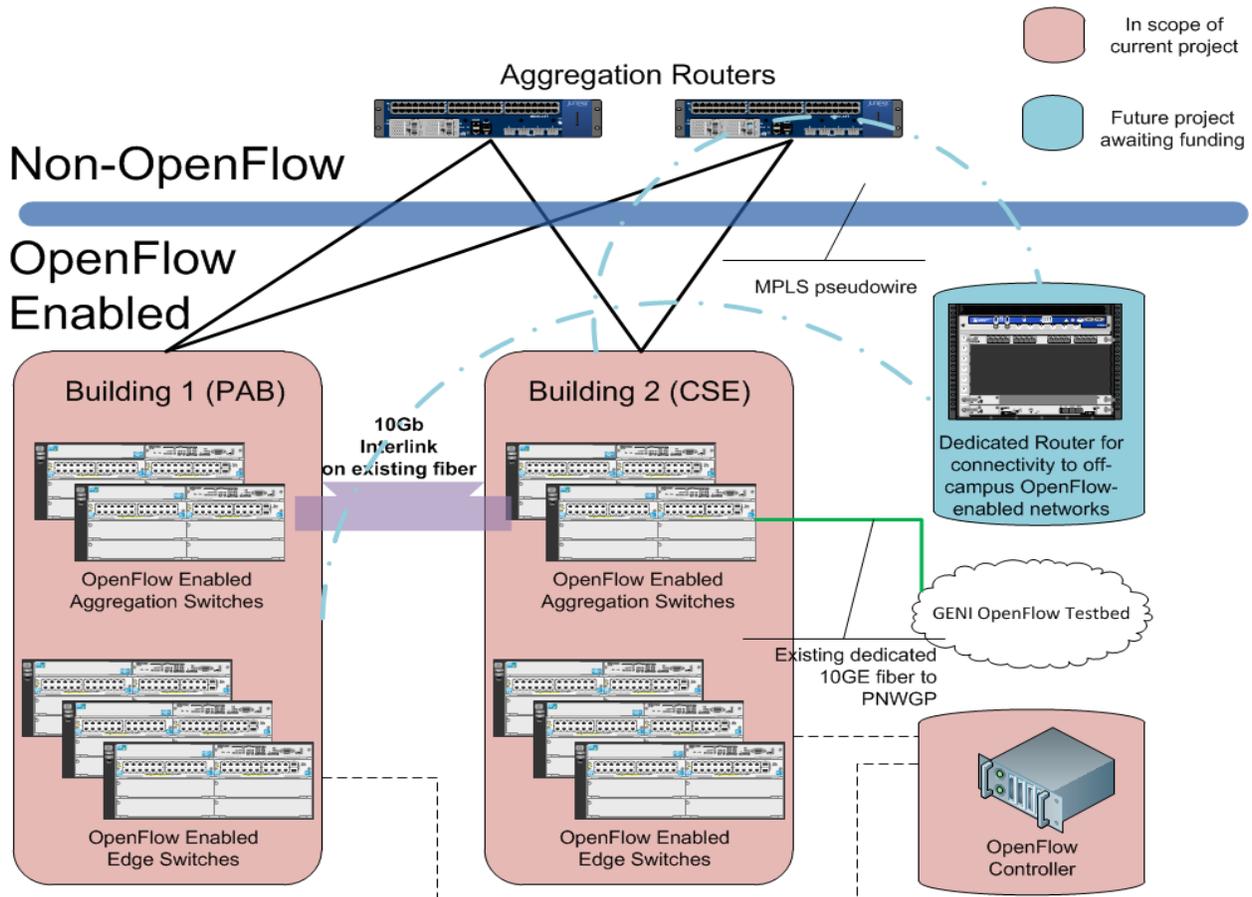


Figure 1 - Initial OpenFlow Design