Introduction

Bandwidth and latency aware network is a novel type of network which allows an application to specify its networking preference, whether it prefers high bandwidth or low latency. Routing mechanism of the network will then take this preference, together with real-time monitored information from external modules, to route each application individually. Overseer is the implementation of this network using OpenFlow as a building block.

PRAGMA-ENT network is a global scale OpenFlow testbed connecting research institutions from all over the world. PRAGMA-ENT offers two levels of access, a direct access to the entire testbed which can only be used for one experiment at a time and a virtual network slice with the use of AutoVFlow allowing multiple experiments simultaneously.

Overseer with PRAGMA-ENT Direct Access

PRAGMA-ENT consists of both OpenFlow and non-OpenFlow switches working in concert. However, having non-OpenFlow switch in OpenFlow network interferes with LLDP discovery process of Overseer. To workaround this problem, Ethernet broadcast address is used for LLDP packet instead of standard Nicira discovery address to allow the packet to traverse through non-OpenFlow devices.

Overlord, monitoring component of Overseer, requires an agent to be installed on each intermediate OpenFlow devices. PRAGMA-ENT is not designed to allow this behavior so dynamic link information update and performance evaluation could be done partially.

To evaluate this setup, we measured bandwidth and latency of all measurable link. The results show that dedicated VLAN links provide better performance in term of both bandwidth and latency in most case.

Overseer with AutoVFlow

At the moment, Overseer does not compatible with AutoVFlow. Overseer utilizes Pox OpenFlow controller framework. However, Pox’s OpenFlow decoding mechanism is non-standard and could not decode AutoVFlow’s virtualized OpenFlow switch properly. We intend to port Overseer to more modern/standardized controller such as Ryu in the future.