

Ryu: Network Operating System

Kazutaka Morita (NTT)

Isaku Yamahata (VA Linux)

16 April, 2012

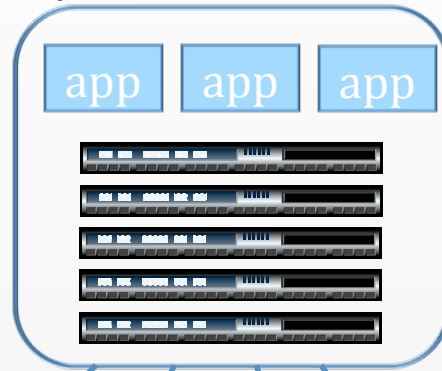
EtherPad URL: <http://etherpad.openstack.org/ryu>

What is Ryu?

- ◆ Open-sourced network operating system
 - ◆ Network operating system
 - ◆ Programmatic network control interface
 - ◆ Logically centralized controller for thousands of switches (OVS, openflow switch)
 - ◆ Open source software (Apache v2)
 - ◆ Fully written in Python
 - ◆ Project site: <http://www.osrg.net/ryu/>
- ◆ Ryu plugin was merged into Quantum Essex
- ◆ Ryu stands for
 - ◆ 流 - Means “flow” in Japanese
 - ◆ 龍 - Means “Japanese dragon”, one of water gods

Overview

Ryu network controllers



RESTful
management API

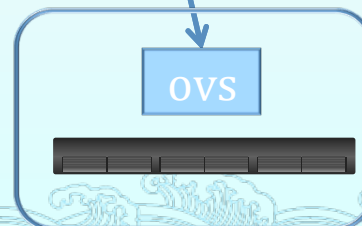
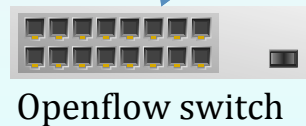
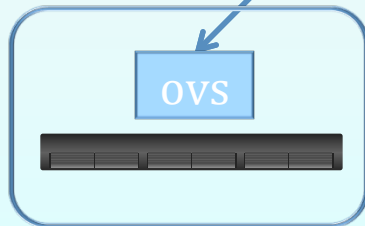
Administrator

Programmatic network control interface

- We can create applications to control network on Ryu

Logically centralized controller

- Decouples virtual networks from the physical network
- Supports OpenFlow 1.0 (including Nicira Extension)



Goals

- ◆ De facto OSS network operating system
- ◆ High quality enough for use in large production environment
 - ◆ Code quality
 - ◆ Functionality
 - ◆ Usability
- ◆ Become the standard network controller of OpenStack (default plugin of Quantum)

What does Ryu bring to OpenStack?

- ◆ Flat L2 networks regardless of the underlying physical network
- ◆ Scalable multi-tenant isolations
 - ◆ Ryu provides tunneling based isolations
 - ◆ VLAN doesn't scale larger than 4096
 - ◆ We don't need high-end switches

TODO items

- ◆ Integration with Quantum IPAM
- ◆ Firewall
- ◆ Virtual network to physical network, and vice versa
 - ◆ Convert among GRE key, VLAN tag, MPLS label, ...
- ◆ Distributed controllers
 - ◆ No single point of failure
 - ◆ Datacenter-wide scalability

Demos

