SDN Software Switch "Lagopus"
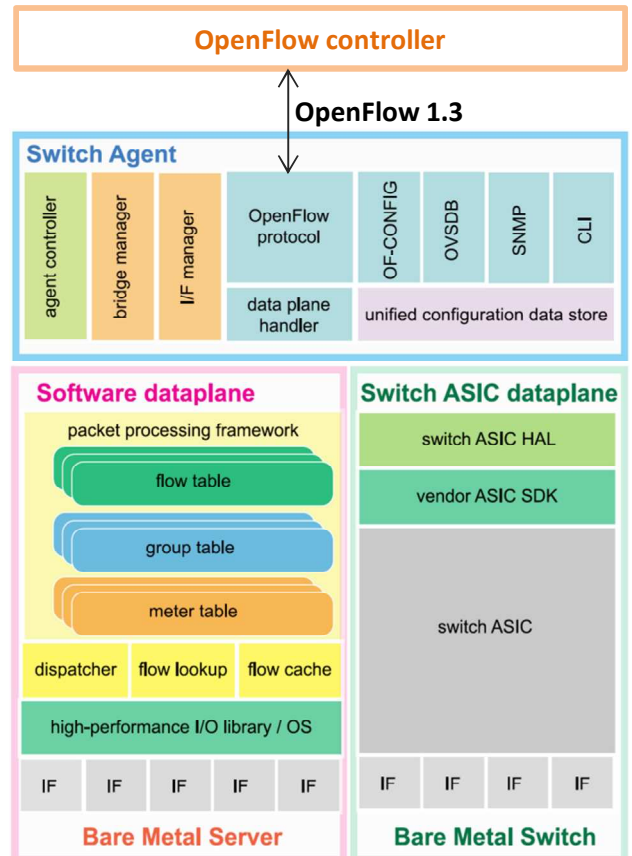
O3project ™

Background

- **Software-Defined Networking (SDN)**
- **Network Functions Virtualisation (NFV)**
  - Service characterization
  - Time-to-Market improvement
  - OPEX/CAPEX reduction
- **Applying advantages of software-based implementation not only to data centers but also to wide area networks**

Issues in applying advantages to wide area networks

- **Performance**
  - Support for 1M flow control rules
  - Forwarding performance over 10 Gbps
- **Functions**
  - Support for various protocols
  - Migration from legacy networks

"Lagopus" features and targets

- **High-performance packet processing**
  - Support for 1M flow control rules
  - Forwarding performance over 10 Gbps

- **Support for various protocols**
  - Extensive support for latest stable specification OpenFLow 1.3.4 (including MPLS, PBB, and QinQ in wide area networks)
    - Top score in "Ryu certification tests" http://osrg.github.io/ryu/certification.html

- **Support for various config/mgmt interfaces**
  - OF-CONFIG, OVSDB, CLI, SNMP, and Ethernet OAM (including features under development)

- **Modular architecture**
  - New protocol modules or management interface modules easily deployed on "unified configuration data store" basis.

- **Support for multiple data planes**
  - General-purpose servers (IA servers)
    - Parallelized and multi-threaded packet processing
    - I/O acceleration by leveraging Intel DPDK
  - Bare metal switches (under development)
    - For general-purpose hardware switches

- **Open source**
  - June 6, 2014 press release: "The world's highest performance SDN software switch will be unveiled as open source software"
  - Released as open source software at http://lagopus.github.io/

OpenFlow controller

OpenFlow 1.3

Switch Agent

agent controller | bridge manager | I/F manager | OpenFlow protocol | OF-CONFIG | OVSDB | SNMP | CLI

data plane handler | unified configuration data store

Software dataplane

packet processing framework

flow table

group table

meter table

dispatcher | flow lookup | flow cache

high-performance I/O library / OS

IF | IF | IF | IF | IF

Bare Metal Server

Switch ASIC dataplane

switch ASIC HAL

vendor ASIC SDK

switch ASIC

IF | IF | IF | IF

Bare Metal Switch

Open Organic Optima

lagopus

NTT

Contact: NTT Network Innovation Labs.
lagopus-support@lab.ntt.co.jp