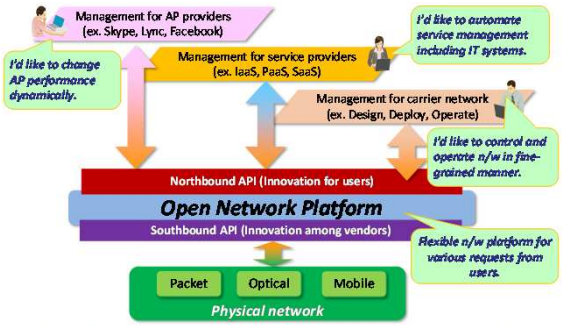
O3 project™

Getting started with O3 Project deliverables

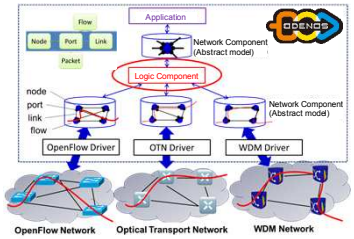
- **Let's create solid SDN solutions with our guideline and OSS (Open Source Software).**



Provide Orchestration for different user requirements

"ODENOS" Object-oriented Network Orchestrator

- **Graph-based Powerful Network abstraction**
- **Network Component**
  - Abstract network as a graph of node, port, link and flow.
  - Extensible to express the physical device features
- **Logic Component**
  - Work on abstracted network objects to provide unified control over them
  - Example: Federator, Aggregator, Slicer and LinkLayerizer



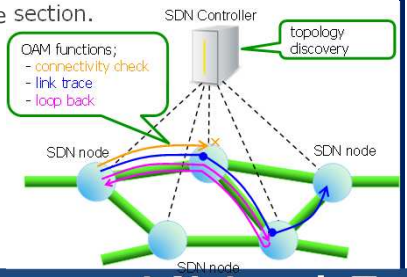
Visit at https://github.com/o3project/odenos

OpenFlow OAM Tools

- **Software Defined OAM functions**

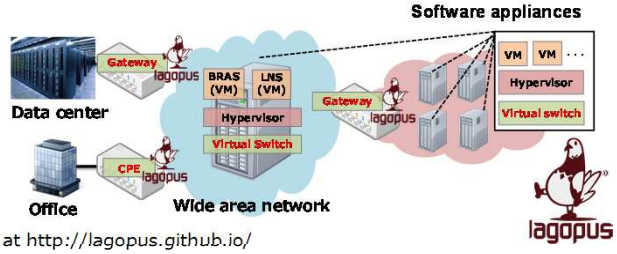
OAM functions for OpenFlow networks are necessary to operate SDN networks. NTT Com has developed and evaluated OAM tools to operate of carrier grade SDN networks.
The developed OAM functions are;
- End-to-end physical topology discovery,
- Connectivity check to verify specified flow,
- Link trace to confirm route of flow and
- Loop back to identify failure section.

This POC has limited performance and scalability because it uses packet-in/out to/from SDN controller. This issue could be solved adopting distributed SDN control model.



"Lagopus" SDN Software Switch

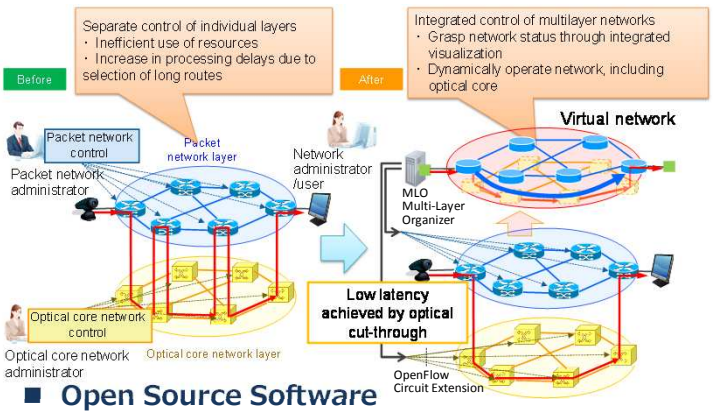
- **Supported protocols/interfaces**
  - OpenFLow 1.3.4 (latest stable version)
  - WAN protocols (MPLS, PBB, and QinQ)
  - OF-CONFIG, OVSDB, CLI, SNMP, and Ethernet OAM
- **High-performance packet processing**
  - Large scale 1-M flow entries
  - 10-Gbps software packet switching



Visit at http://lagopus.github.io/

SDN Transport Network Technology with User Control
~Wide Area Network that can keep up with users' ever-changing demands~

- **Purpose**
  - Provide a simpler method for user to use a wide area network control technology that is becoming more complex
  - Satisfy user demand by consolidating management and control of multi-layer network comprised of packet and optics
- **Technology content**
  - Multi-layer management and control (Hitachi, Ltd.) Based on network resource request from an application, resource management and control feature finds a resource from a lower layer resource pool and allocates it to a higher layer traffic
  - Optical Cut-through technology (Fujitsu, Ltd.) Provide low latency network to user by configuring an end-to-end optical direct path by using packet and optical core network path



- **Open Source Software**
  - PKT-Transport of O3 Orchestrator & Controller suite & Compatible nodes (MLO) (Hitachi, Ltd.)
  - OPT-Transport Apps of O3 Orchestrator & Controller Suite (Fujitsu, Ltd.) Visit at http://www.o3project.org/ja/fujitsu/

Visit at "www.o3project.org/en."

NEC NTT NTT Communications FUJITSU HITACHI

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