From Lithium to Beryllium: Production-Ready Open SDN Platform
Significant Industry Investment in Open SDN

Total Contributors
- Total: 1,336
- Floodlight 76
- Ryu 88
- ONOS 133
- Contrail 141
- Open vSwitch 279
- OpenDaylight 649

Total Code Commits
- Total: 59,145
- Floodlight 2667
- Ryu 2996
- ONOS 6,003
- Contrail 8,028
- Open vSwitch 11,546
- OpenDaylight 28,892

Source: OpenHub.net, Feb '16
From Lithium to Beryllium

- Growing ecosystem
- Increasing number of end users
- Maturing code base
- Additional competitors
- Applications emerging

Number of Contributors

<table>
<thead>
<tr>
<th></th>
<th>Hydrogen</th>
<th>Helium</th>
<th>Lithium</th>
<th>Beryllium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributors</td>
<td>154</td>
<td>291</td>
<td>502</td>
<td>629</td>
</tr>
</tbody>
</table>
Vibrant Advisory Group
OpenDaylight Deployments are a Community Affair
OpenDaylight Performance: A Practical, Empirical Guide

ODL Use Cases in World’s Largest Carrier, Enterprise and Research Networks
End-to-end Performance Testing at Scale
Protocols (BGP, OpenFlow, OVSDB, NETCONF, PCEP)
Beryllium: Production-Ready Open SDN Platform

Graphical User Interface Application and Toolkit (DLUX / NeXT UI)

AAA AuthN Filter

OpenDaylight APIs REST/RESTCONF/NETCONF/AMQP

Base Network Functions
- OpenFlow Stats Manager
- OpenFlow Switch Manager
- OpenFlow Forwarding Rules Mgr
- L2 Switch
- Host Tracker
- Topology Processing

Network Services
- Service Function Chaining
- Reservation
- Virtual Private Network
- Virtual Tenant Network Mgr.
- Unified Secure Channel Mgr.
- Link Aggregation OIF Protocol

Network Abstractions (Policy/Intent)
- OVSDB Neutron
- Device Discovery, Identification & Driver Management
- U6P Service
- DOCSIS Abstraction
- SNMP/SDON

Network Abstractions (Policy/Intent)
- ALTO Protocol Manager
- NEMO
- Network Intent Composition
- Group Based Policy Service

Platform Services
- NetIDE
- AAA
- Neutron Northbound
- Fabric as a Service
- SDN Integration Aggregator
- Controller Shield
- Time Series Data Repository
- User Network Interface Mgr
- Centrino – Streaming Data Hub

Data Store (Config & Operational)

Service Abstraction Layer/Core

Messaging (Notifications / RPCs)

Southbound Interfaces & Protocol Plugins

OpenFlow Enabled Devices

Open vSwitches

Additional Virtual & Physical Devices

Data Plane Elements (Virtual Switches, Physical Device Interfaces)
New Capability
• Improve performance, scalability, and robustness to support mission critical deployments

Challenges
• Production deployments driving significantly higher demand from ODL than early POCs
• Explosive growth of OpenDaylight contributions

OpenDaylight Features
• Enhanced clustering and database sharding
• Workload placement on hosts with DPDK-accelerated virtual switches
• Code developed using Best in Class Continuous Integration environment - over $1M spent per year on testing & integration

Benefits
• Enable distributed controller deployments to improve scalability and availability
Enhanced OpenStack Integration

New Capability
• New capabilities to extend OpenDaylight-OpenStack integration

Challenges
• Integrating with Cloud platform that was designed pre-SDN
• Cloud deployments demand high availability and redundancy
• Emerging needs of NFV go beyond those of pure cloud

OpenDaylight Features
• Neutron API enhancements to enable use of ML2 Plug-in
• Full support for OpenStack HA and Clustering
• Improved security with HW-VTEP and efficient security group configuration via OF
• OpenStack BGP-VPN support

Benefits
• Enhanced robustness and security for OpenStack over OpenDaylight deployments
Enhanced Application Integration

New Capability
  • Expanded NorthBound API support

Challenges
  • Application developers are seeking portability across various controller implementations

OpenDaylight Features
  • Network Intent Composition (NIC) enhancements
  • Application interface support via message queue (AMQP)
  • NEMO support - a declarative service oriented NBI language
  • Application Layer Traffic Optimization (ALTO, RFC 7285)

Benefits
  • Provide a diverse set of abstracted northbound API to support diverse applications
Enhanced Tooling

New Capability
• New tools to enhance the OpenDaylight software lifecycle

Challenges
• Dozen of companies building solutions on ODL
• Many apps already written to 1st generation controllers
• Network management is increasingly complex in virtual and physical environment

OpenDaylight Features
• NeXt UI Toolkit to enable network visualization
• NetIDE enables apps written for other SDN controllers (Ryu, Floodlight, and Pyretic) to work with OpenDaylight
• TSDR and Centinel enable Big Data Analytics for streaming data

Benefits
• Improved efficiency and cost reduction
ODL Platform: Broadest Set of Use Cases

- Automated Service Delivery
- Network Resource Optimization
- Visibility and Control
- Regional / Metro Network Automation
- Cloud and NFV
How to Get Started

Download
People can download directly from OpenDaylight.org.

Find a Solution or Provider
ODL is the only open source SDN platform with a robust ecosystem of products, solutions, distributions, and other providers who can help you deploy open SDN in your network.

Getting Started Guide
A comprehensive guide for newbies and advanced users to learn about, install and deploy OpenDaylight.

http://www.opendaylight.org/start
Thank You

Neela Jacques, Executive Director, OpenDaylight
@NeelaJacques