



# Lumina SDN Controller



**The Lumina SDN Controller, powered by OpenDaylight™, helps Service Providers and enterprises take control of their network in support of their digital transformation.**

## Overview

Lumina provides SDN technology and NetDev Services to equip Service Providers with the tools needed to accelerate their transformation to software networking.

At the core is the Lumina SDN Controller, a quality-assured edition of the industry-leading OpenDaylight controller. Combined with Lumina's NetDev Services, providers can implement software-defined networks on their own timeline using an Agile development methodology. Lumina delivers multivendor interoperability using a common control plane and contributes its code back to the open source community.

Lumina brings open source leadership, respect for the customer's innovations and a highly collaborative approach to help organizations accelerate the delivery of new services.



## Highlights

- Provides a fully tested and vendor supported distribution of the industry leading OpenDaylight controller from the Linux Foundation®
- Pure play open source approach that is vendor neutral
- Contributes new code and changes to the upstream development community without forking
- Comprehensive support program for both network operators and in-house software developers
- Licensing and support programs that allow you to innovate and invent without the typical vendor contractual terms
- Based on the industry-leading open source SDN platform, OpenDaylight, that boasts over 1 billion users world-wide and includes support from nearly 50 major networking vendors
- Includes a variety of southbound plugins that connect to and support popular platforms from the industry's leading switch and router manufacturers
- Enables migration to advanced switching using standard flow-control protocols, segment routing or path computation tools
- Provides a selection of northbound applications topologies with easy-to-use GUIs and APIs for managing flows and southbound equipment
- Supported by the most popular orchestration tools and virtual infrastructure managers network allowing straight-forward migration to function virtualization
- Lumina's advanced Network Development Services can help you develop, test and integrate the software you need to use Agile development methodologies



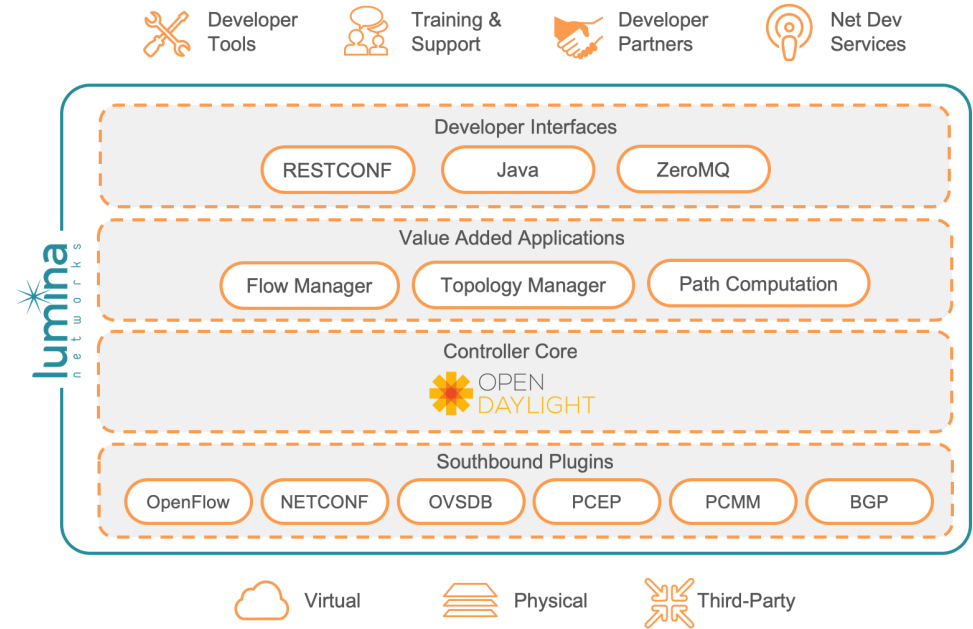
# Lumina SDN Controller powered by OpenDaylight

The centerpiece of Lumina’s SDN product line is a controller built on OpenDaylight. Public customer surveys conducted by SDxCentral and others have shown a strong preference for OpenDaylight as the controller technology of choice for SDN. AT&T, Verizon, Tencent and other major carriers use OpenDaylight-based controllers, and the Linux Foundation has announced that over 1 Billion users subscribe to services based in-part on the use of OpenDaylight.

## At a high-level, the OpenDaylight controller has three parts:

- A central Service Abstraction layer that normalizes all data exchange via YANG
- A southbound selection of control interfaces that connect to common switches and routers using protocols such as NETCONF, OpenFlow, BGP/PCEP and OVSDB.
- A northbound selection API aimed at supporting applications using RESTCONF

This architecture allows the controller to enable software-defined networking by abstracting and normalizing the interface to a variety of network devices. At the same time, the controller facilitates the development of applications, interfaces and scripts for activating specific use cases.

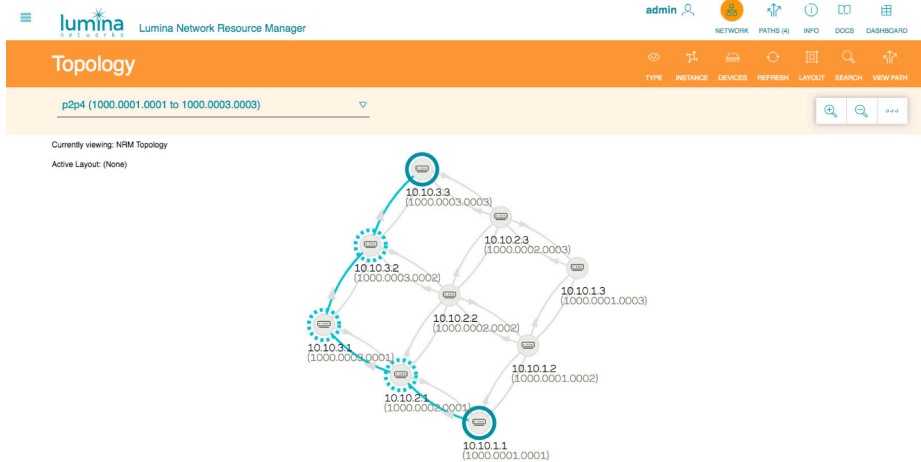


*Common use cases for the SDN controller are SD-Core, Network Configuration Management, Zero-Touch Installation, Network Analytics and Policy Control, Brownfield Adaption, and Alarming and Notification.*

## Lumina Related Products

Lumina's products include several optional controller based applications. These applications help you perform specific use cases, using the unique platform capabilities of the SDN controller.

**Lumina Network Resource Manager** enables more simplified and sophisticated traffic engineering of the network with advanced algorithms, such as path-computation for efficient traffic flow. Administrators can view and interact with the network topology, using real-time information to perform traffic engineering and network flow direction based on end-to-end views. The Lumina Network Resource Manager application allows you to view the network topology, search for and manage OpenFlow 1.3-compliant switches, view a summary of switch configuration and operational data by hovering over the icons and apply OpenFlow 1.3 actions, such as drop or push VLAN.



## Lumina Extension & Adaptation Platform (LEAP)

LEAP is an extensible software platform that enables the automation of legacy network elements using model driven frameworks, shielding the complexity of underlying south bound interfaces and enabling northbound applications. LEAP uses a microservices architecture to extend the capabilities of Lumina's OpenDayLight based SDN controller to enable better integration with business layers. In a language agnostic manner, the platform promotes addition of new microservices based components.

## NetDev Services

Organizations that wish to accelerate the implementation of their open software network and want to expand the skill set of their network engineering and operations team through hands-on experience can utilize Lumina NetDev Services. Our NetDev Services team works with customers to jointly develop production systems using Agile methods to prototype and speed through proof-of-concept and pilot phases. With expertise in both north and southbound traffic, this team of software and network engineers are leaders in the open source space who can help you pull your projects across the finish line. The methodologies enable the engaging customer teams to become self-sufficient in developing and managing the deployed platforms.



## Lumina SDN Controller Editions

The Lumina SDN Controller comes in two editions:

**Lumina SDN Controller Commercial Edition** is a quality-assured version of the industry-leading OpenDaylight controller licensed for production networks. Providers can scale their deployment with the needs of their network through an annual license based on the number of controlled nodes. Lumina delivers multivendor interoperability using a common control plane and contributes its code back to the open source community.

**Lumina SDN Controller Developer Edition** is the first production developer platform built directly from the OpenDaylight community code, without any proprietary extensions or platform dependencies. Developers retain ownership of their developed applications and can count on portability to other.

OpenDaylight-based controllers. The annual license lets developers create and deploy applications in development networks. Developer support includes a catalog of tools and support services to speak directly with our developers, including contributors and committers in the OpenDaylight (ODL) community.

# Lumina SDN Controller - Features Supported

## OpenDaylight Projects Supported

- BGP-PCEP
- Controller
- Data Export Import
- MD-SAL
- NETCONF
- NetVirt
- ODL Root Parent
- OpenFlow Java
- OpenFlow Plug-in
- OVSDB
- Neutron
- YANG tools
- PCMM

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*Additional Supported Projects, Features, and Plugins available with the Lumina Extension and Adaptation Platform.*

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## Other Features

- Installation scripts
- Data migration and upgrade tools
- Operator's web—based GUI and application slider

## Service Interfaces

- Karaf: <http://karaf.apache.org/> (4.1.6)
- OSGi: <http://www.osgi.org/>
- Akka: <http://akka.io> (2.5.11)

## Southbound Plugins

- OpenFlow 1.0 and 1.3
- NETCONF/YANG (RFC 6241/6020/6470/8040)
- OVSDB
- BGP—LS/PCEP

## Northbound Applications and Plugins

- RESTCONF
- OpenStack Neutron, ML2 Driver
- Lumina Topology Manager”
- Lumina Network Resource Manager ”
- Lumina Zero Touch Installer”
- Lumina Overlay Manager”
- Lumina VNF Manager”
- Flow Optimizer

## Editions and Support

- Lumina SDN Controller Commercial Edition
- Lumina SDN Controller Developer Edition and Support
- Eclipse Public License v1.0—Compliant Source Code Distribution
- Developer's Repository, Archetype and Support
- 24x7 Operations and Deployment Support

## NetDev Services

- Custom software development
- Testing and integration services
- Operations support
- Architectural design
- Software practice methodology, Agile development
- Education and training

## Pricing

- Annual recurring and subscription licenses are measured by nodes, seats, virtual machines or ports supported, depending upon the product
- NetDev Services are priced via contract or statement of work
- Perpetual licenses, packages, longer terms and volume purchase agreements can be specified by contract
- Eclipse Public License v1.0 source code distributions are available at additional no charge

## Results you should expect

Lumina Networks strives to be the catalyst to bring open software networking out of the lab and into a live network. The results that Lumina hopes to help you achieve include:

- Turning your ideas into engineering action to bring new services and capabilities, not possible without the architectures of open software networks, into your production network
- Successful PoCs and trials that prove concepts to advance your network technology, architecture and engineering competencies
- Vision and thought leadership within your organization and the industry in your move to next-generation software and cloud-based networking
- Evolution from closed, vendor-specific platforms to industry-wide, open source platforms that shift control from the vendors to you that includes your requirements in roadmaps
- Launch of transformative initiatives that enable you to migrate systematically to software networking, while protecting the investment and use o+ your current resources
- Integration into your current business systems of new software infrastructure tools including cloud orchestration platforms, virtual network functions and virtual infrastructure managers
- Ability to innovate at the industry level, contribute code to open source programs and employ Agile Software Development methods and DevOps like Practices that “reduce cycle times and speed your organization’s ability to move and react
- Retooling and retraining of you network engineering and operations team to be ready for tomorrow’s software networking architectures and to improve collaboration with your IT department
- Starting your build-out of next generation SDN and NIV-based use cases including network configuration management, whitebox switching, deployment of network function virtualization, central office redesign, data center virtualization and automation, SG wireless data aggregation and evolved packet core



### About Lumina Networks

We take supported OpenDaylight projects, vetted by the community, for safe and secure deployment into the network. Our own NetDev team works directly with internal development teams to build the tools specific to an organization which ensures secure and reliable implementation.

We believe in teaching our customers “how to fish,” sharing our best-practices and offering our expertise along the way. Companies quickly expand the skills and abilities of their development teams while removing the reliance of outside consultants where vendors lock in to use their product. Lumina Networks and its SD-Core platform can be deployed across a wide spectrum of business verticals without hesitation. Additionally, our NetDev services combined with close relationships with the Linux Foundation means companies always have the newest and most innovative solutions available to solve critical business problems.

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