SOLUTION BRIEF

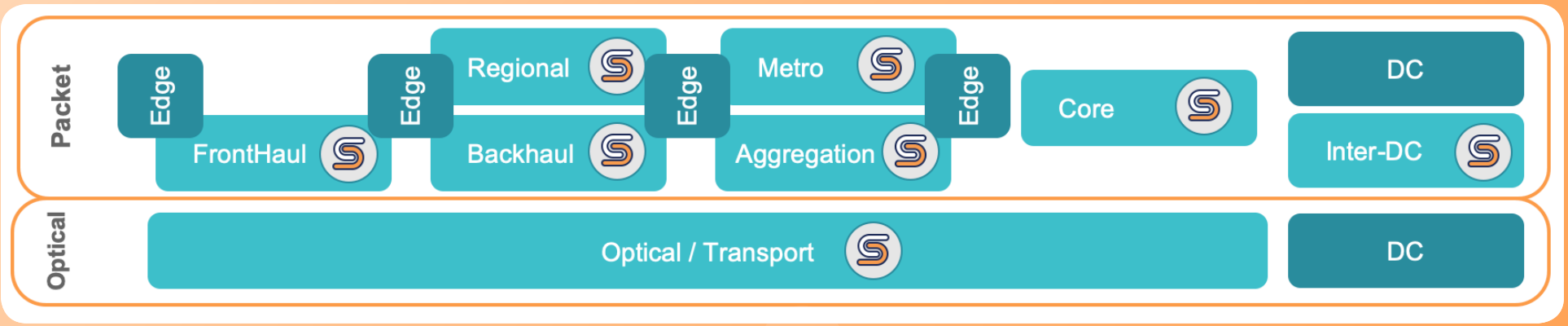
SD-Core: Multi-Layer, Multi-Domain Control for Heterogeneous Networks

SD-Core changes the way you control your network, create services, and deliver new business models.

- Reduced time and effort to integrate a new equipment vendor into your IP/MPLS network increases commercial tension and lowers CAPEX
- Reduced software footprint to have a single controller for both optical and packet domains
- Reduced time to provision a new customer
- Reduced time to define and launch a new service
- Increased efficiency in bandwidth utilization across the domains
- Ability to define and support more types of services to be more competitive and innovative

Software-Defined Core (SD-Core) is an open source-based solution which returns network control to the Service Provider and enables future-proof service agility.

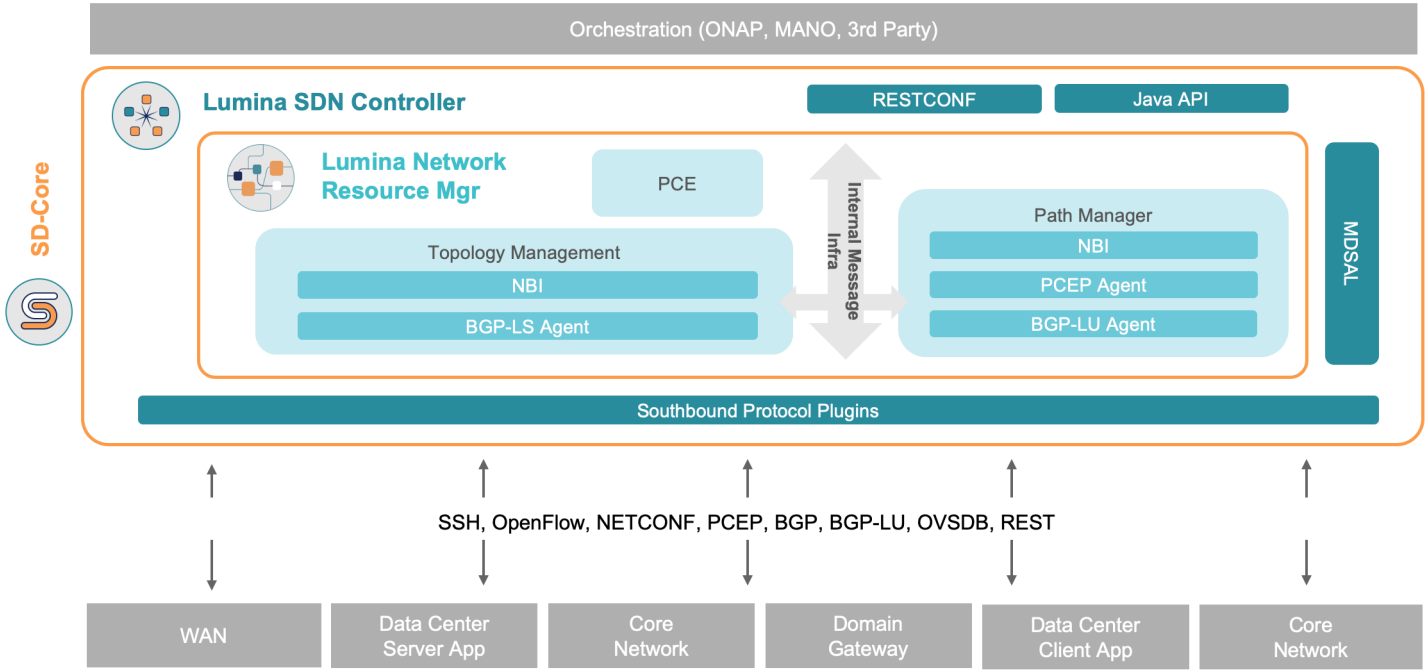
SD-Core leverages next-generation SDN architectures to provide end-to-end network visibility. These next-generation architectures revolutionize network capabilities by unifying network controls from the access, across edges, to the datacenter, and to the core. By merging legacy, cloud and programmable resources, SD-Core removes network silios to improve efficiencies and flexibility. An important part of SD-Core, automation enables efficiencies which are unattainable in current network architectures. Beyond automation however, SD-Core - with PCE, topology learning, and combined services and infrastructure(path) provisioning - provides control beyond simple management.



End-to-End SD-Core Enabled Control

The Illustration below shows the breadth of SD-Core in a transforming network. Components of this architecture are described in the "Lumina SD-Core Products" section to follow.

To enable full automation, the components of SD-Core work together using standardized control network resources across any domain and in any layer, with continuous feedback loops. The SD-Core tools abstract yang models into device configurations, dynamically engineer traffic, and control disparate resources, to unify networks and enable capabilities like network slicing.

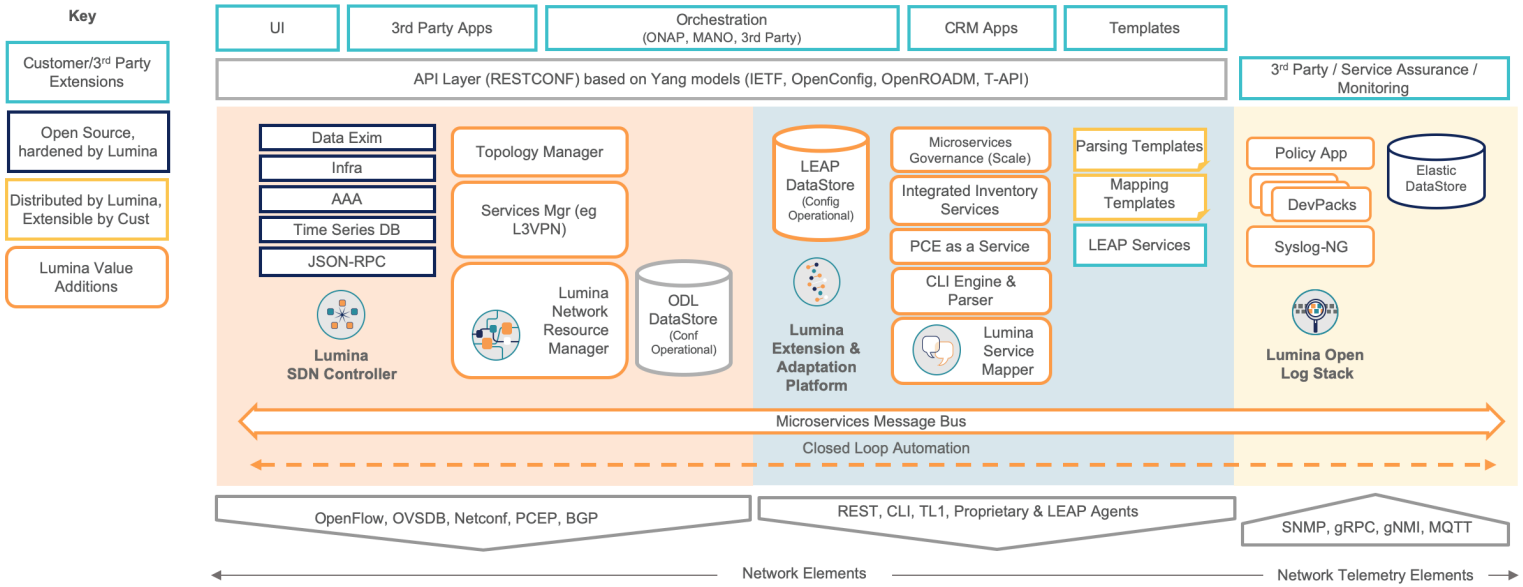


SD-Core supports capabilities previously prohibitive due to management overhead and risk:

- Core MPLS networks with services L3VPN, ELINE, ELAN, ETREE for automated provisioning
- Any network that leverages MPLS i.e., backhaul, aggregation, metro/ carrier-Ethernet
- Transport (aka transmission, optical) networks
- Integration of other VNF / application specific WAN services

With SD-Core, CSPs can deliver on-demand, customizable experiences to their customers while reducing service calls. By changing the way service providers manage their networks, create services, and deliver new business models, SD-Core solutions are in production around the world with incredible results.

Lumina SD-Core Products



The Lumina SD-Core solution has several product components which create the above mentioned capabilities:

- **Lumina SDN Controller** - The Lumina SDN Controller powered by OpenDaylight (ODL) provides a common, open platform for service providers or developers, giving direct control over SDN development and implementation. This emerging approach helps eliminate vendor lock-in and puts users in charge of their own network evolution. The Lumina SDN Controller is 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.

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

  1. A a central model-driven service abstraction layer that normalizes all data exchange via YANG
  2. A "southbound" selection of control interfaces that connect to common switches and routers using protocols such as NETCONF, OpenFlow, BGP/PCEP and OVSDB.
  3. A "northbound" 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 and providing telemetry for closed-loop automation.

- **Lumina Network Resource Manager** - Suite of applications enable better utilization of the network by intelligently managing slices, creating paths through these slices and mapping services to the paths. Through these actions, the telco is now enabled to control costs on the network, as well as better groom traffic to guarantee appropriate treatment. In addition, the telco is also empowered to start offering services for 5G. The three variations of this application — LNRM-Packet, LNRM-Optical, LNRM-Flow — are adapted to make sure end-to-end control is supported.

To enable other use cases including close-loop automation and real-time telemetry, these other Lumina products help create and end-to-end solution:

- **Lumina Extension & Adaptation Platform** - LEAP is a modern software framework from Lumina that enables automation of legacy network elements using model-driven frameworks, in an extensible fashion. LEAP extends Lumina's OpenDayLight based SDN controller using a microservices architecture and enables better integration with business layers. LEAP also promotes the addition of new microservices based components in a language-agnostic manner, thereby enabling operators to use the Python skills of their DevOps teams to extend their service automation frameworks in-house, based on business demands, without dependency on external vendors. In addition, LEAP facilitates a rich monitoring infrastructure with diverse southbound plugins including gRPC & gNMI and traditional SNMP interfaces, to enable device telemetry collection for network visibility.

- **Lumina Service Mapper** - With the advent of SDN interfaces like netconf, most OEMs have started supporting netconf interfaces natively in the Network Elements. However, the yang models exposed by the NEs are still proprietary, and every OEM ends up projecting yang models that are a reflection of their CLIs, or a proprietary model. As a result, operators are still left with having to deal with a multitude of models for the same service. Lumina Service Mapper is an intelligent application that enables seamless model translation from standardized data models to vendor proprietary models. Working in unison with the Lumina SDN-Controller, the application translates models for proper network configuration by the controller. LSM also enables normalization of alarms in the monitoring path, enabling vendor neutral alarm collection and monitoring. LSM greatly simplifies operators quest in true end-to-end service automation and monitoring, using its extensible translation framework.

With years of open source leadership, hundreds of fixes and lines of code committed, and several successful tier-1 production deployments, our services team has the experience and training needed to help guide your transformation.

Our worldwide team of open source networking experts work in agile sprints to design and deploy customized solutions to fulfill your specific business needs. This development exercise, managed in conjunction with our customers, helps transforming teams reach technical and operational objectives. Co-developed solutions to enable agile, automated mobile and fixed telecommunications networks around the world. By working along-side our team of open source leaders, some of the world's most advanced Service Providers have learned to thrive in this dynamic market place while accelerating their transformation processes. Together, we changed service deployment processes, simplified service creation and support, and created unified multi-vendor network control.

Features

- Domain-agnostic Path Compute Engine
- Seamless applicability to optical, packet and openflow domains
- Extensible path-compute constraints
- Multi-layer topology representation
- Cross Layer Correlation capabilities (roadmap)
- Topology discovery through BGP-LS
- Path provisioning through PCEP or BGP-LU
- Service mapping at provider-edge using NETCONF

Southbound Plugins:

- NETCONF
- BGP-LS
- PCEP
- BGP-LU

Northbound Interfaces:

- RESTCONF
- Message Bus Interface (roadmap)

Support Services

Developer Support

- Distinguished by users and requests
- Named developers (users)
- Developer focused requests: Design questions, code reviews, community engagement, application interoperability / regression testing etc.
- Provided during geo business hours, no SLAs on response or resolution
- Tools e.g., Slack and private channel to provide coverage and fitting response
- Not to be used for critical network issues

Operations Support

- Distinguished by users and requests
- Any user with Licenses entitlement codes
- Support focused requests: Break-fix, troubleshooting, upgrades etc.
- Provided 24x7 via global Tier-1 technical support group
- Flat focused and capable teams above Tier-1 provide necessary ODL and associated skills
- Large and strategic customers to be offered premium support to better cater to scale and complexity

lumina networks

luminanetworks.com
800.930.5144

Lumina Networks, Inc.
2077 Gateway Place, Suite# 500,
San Jose CA 95110