lumina networks

DATA SHEET

Lumina Network Resource Manager

The Problem

A variety of networks make up core infrastructure for Telecommunications Service Providers. This multi-domain, multi-layer, multi-vendor core is the foundation for revenue-generating services. Given the complexity of these networks, it often becomes a challenge to effectively control and manage a unified network. The current model of stringent service SLAs leads to over-provisioned, under-utilized, statically-provisioned resources in an attempt to reduce complexity and meet control expectations.

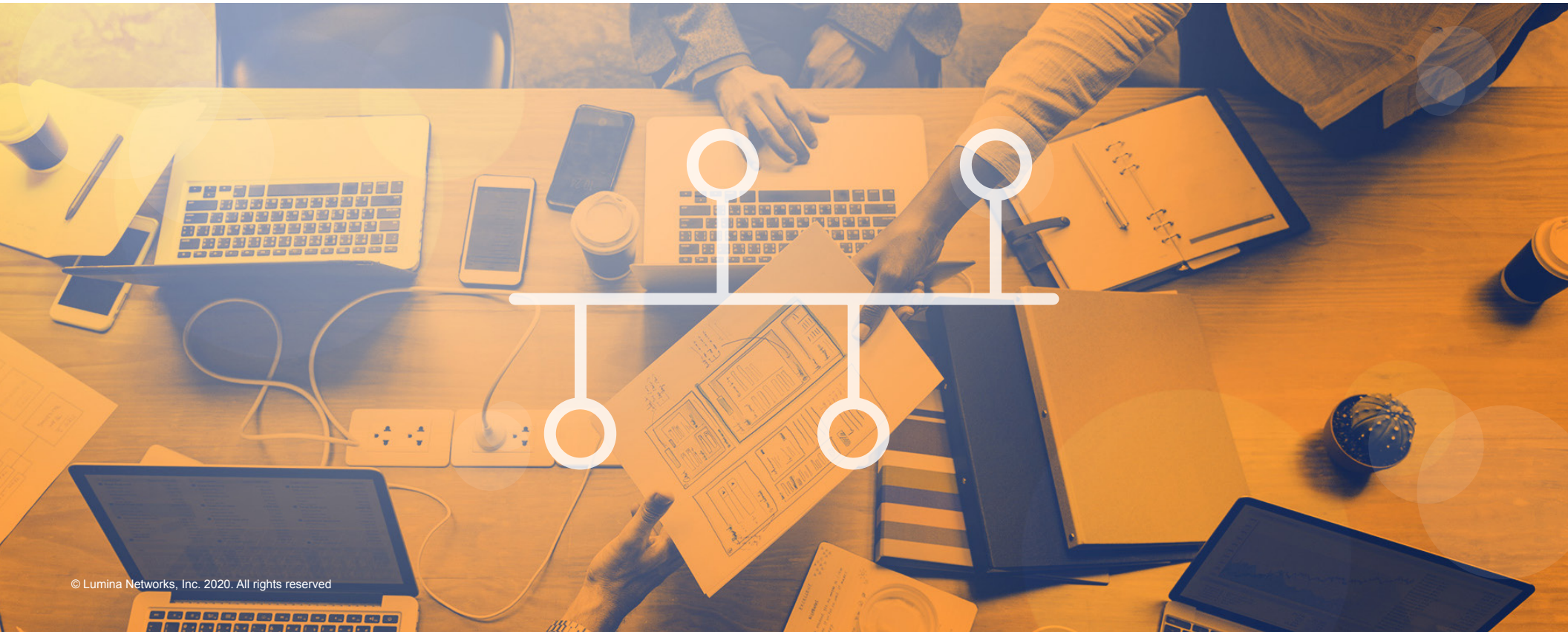
" The 4G and 5G technologies are going to co-exist for a long time. It's vitally important that we facilitate standards-based interoperability between the two."

— Leon Chang,
Technical Architecture Director at AT&T
SOURCE: https://bit.ly/2PZQ0a9

Distributed network control protocols for path provisioning and traffic engineering can't scale for a digital world—massive data and device increases. To meet this demand, Service Providers are transforming network architectures to engage the agility of cloud, software-based technologies which creates a new layer of complexity during the period of transition.

Well into this network transformation, Service Providers have started to recognize that next generation networks won't be greenfield. This has lead to arguably the largest challenge in the transformation—automating existing traditional MPLS-TE technologies inline with new resources. With their known scaling limitations, creating unified programmable network paths with MPLS resources requires new tooling and a shift to more simplified and scalable MPLS Segment Routing.

For optical resources in transforming networks, built-in proprietary EMS system controls generate vendor lock-in challenges. These challenges make it hard to unify control of optical underlay and packet overlay which leads to bandwidth inefficiencies—from bandwidth provisioning buffers at each layer independent of the other layers.



Lumina Solution

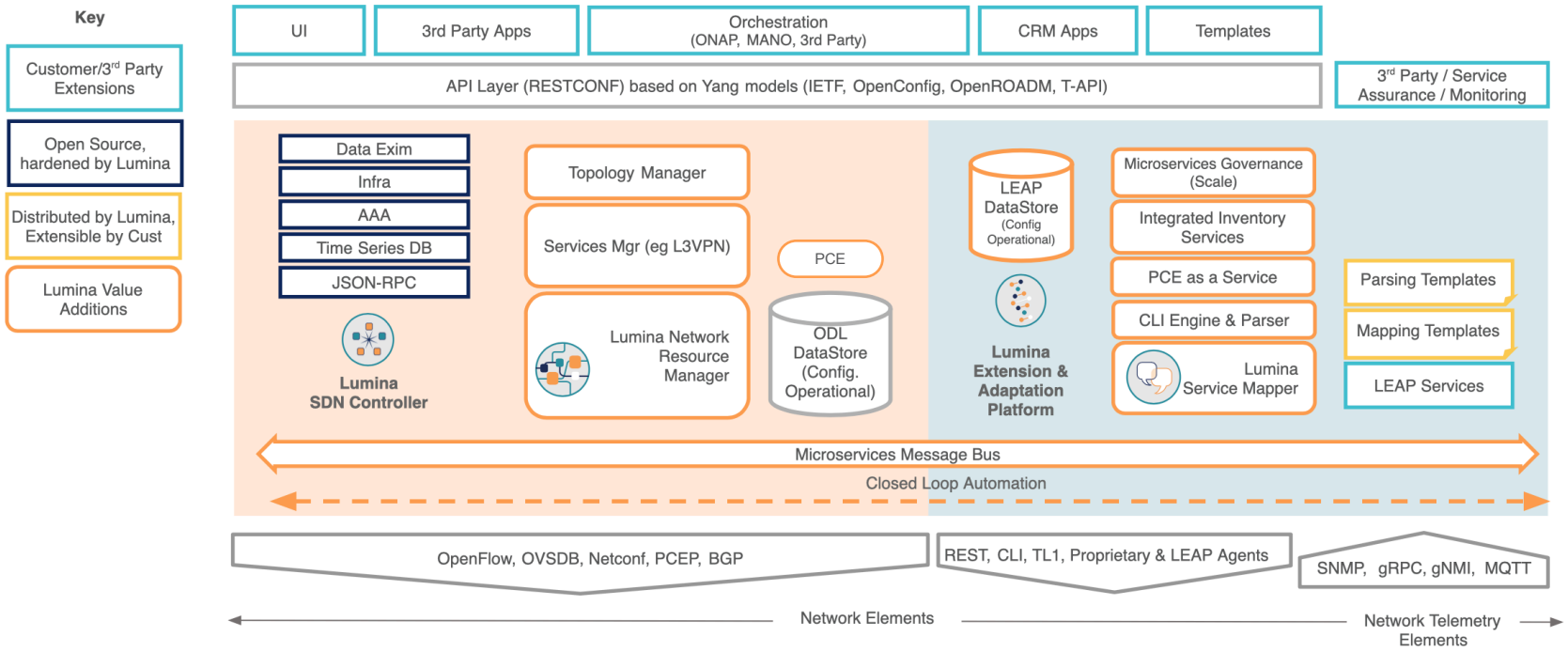
Unified end-to-end control of heterogeneous environments to enable transforming networks

Lumina Networks' Network Resource Manager (NRM) is a centralized network control application built for the industry's leading, and most widely deployed Open Source SDN controller, OpenDaylight. Enabling simplified and sophisticated traffic engineering, NRM uses advanced algorithms to dynamically optimize network traffic. As part of the Lumina SD-Core solution, NRM eases the challenges noted above by better managing and provisioning resources while the APIs provides dynamic control. This improved efficiency reduces the need to over-provision statically thereby increasing utilization.

The Lumina NRM along with the OpenDaylight-based Lumina SDN Controller, provide central control for multi-domain networks to enable resource automation and traffic engineering. Through standardized and open interfaces and APIs, NRM is a domain-agnostic, multi-layer capable, Path Computation Engine. The centralized nature of the application enables NRM to manage 5G networks at mass scale.

There are three variations of NRM uniquely capable of controlling and managing packet, optical or flow-driven networks. For a typical transforming network, with resources at all of these domains, NRM unifies path computation to improve network utilization, reduce response time to failure events and optimize the software control foot-print.

An essential capability to provide differentiating services, path computation across an end-to-end network will enable things like network slicing and on-demand service delivery by dynamically optimizing network traffic paths. To meet changing market demands and improve the customer experiences, NRM brings the flexibility and agility required in next-generation networks to monolithic resources.



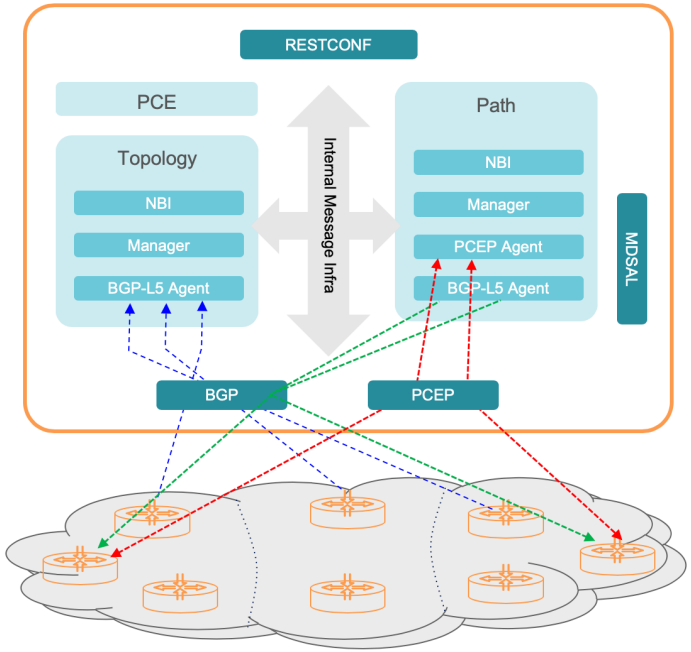
Product Architecture

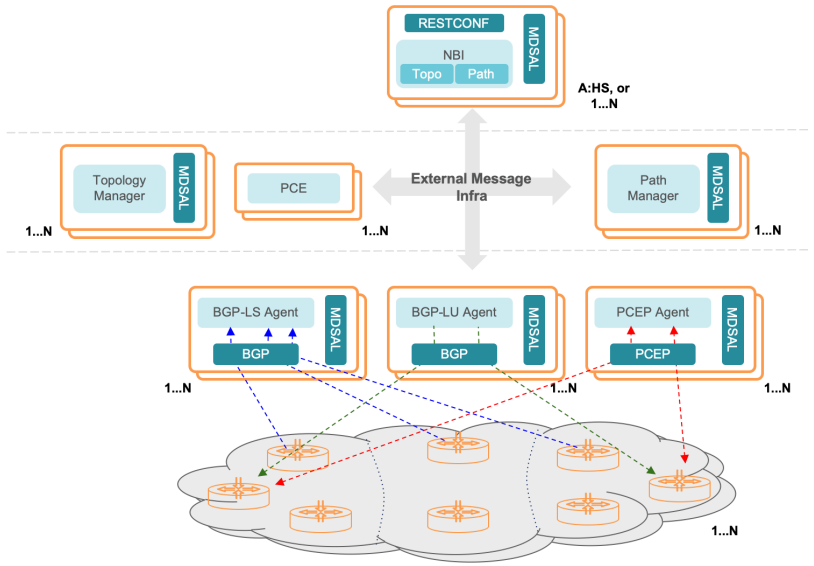
Lumina NRM is built as an open-source solution based on a microservices-based architecture for scalability and extensibility. It draws upon years of community innovation, hardened by Lumina and running in large Tier-1 networks.

With the ability to configure and manage underlay and overlay topologies, NRM helps realize the segment routing architecture with key components including:

- Path Compute Engine (PCE) for Traffic Engineering functions
- BGP-LS for topology learning
- PCEP, BGP-LU and NetConf for path-provisioning and different telemetry interfaces for continued monitoring
- Supports both traditional MPLS protocols such as RSVP based path reservation as well as the latest MPLS-SR technology implementations for dataplane path protocol transition

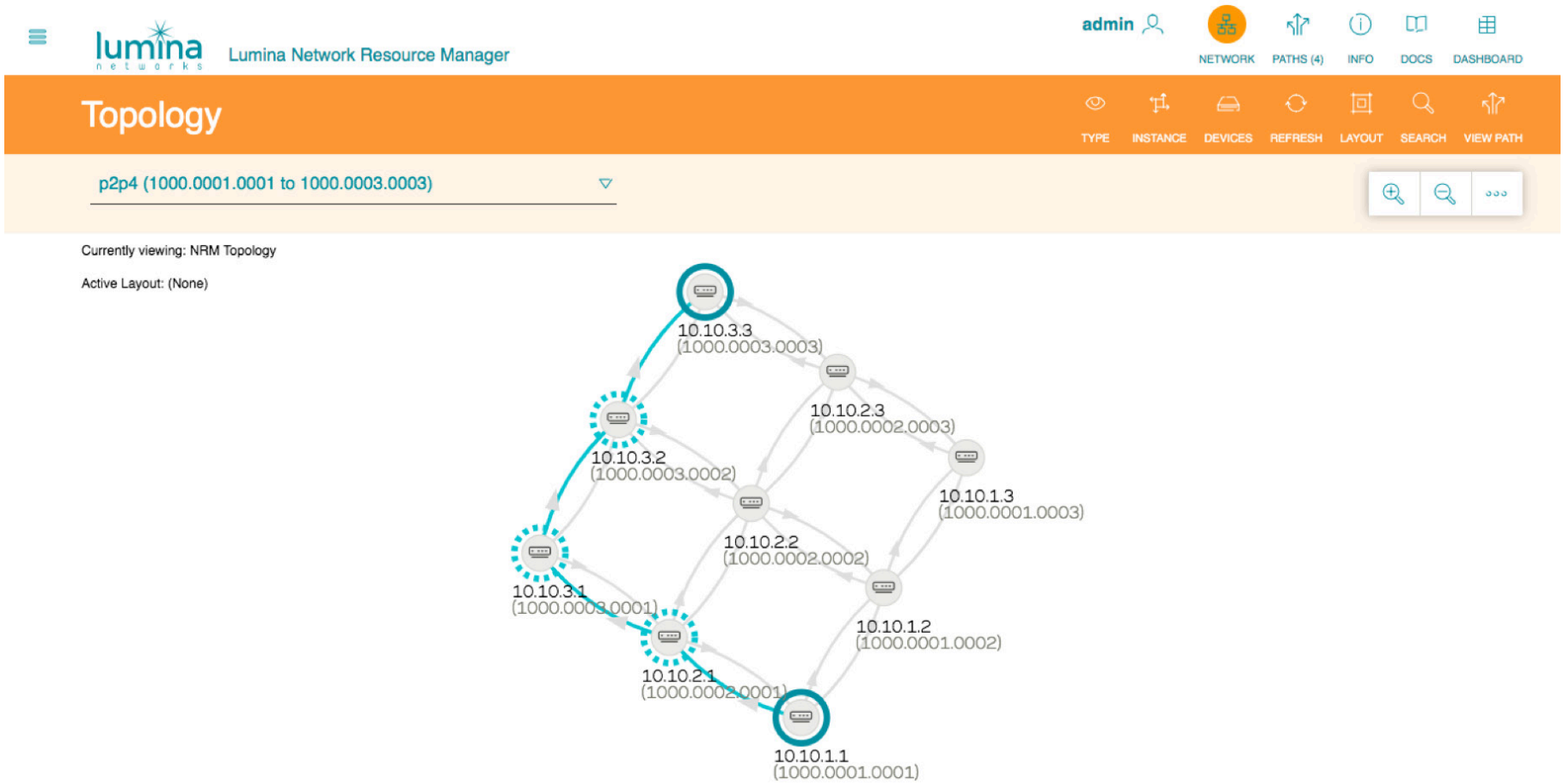
NRM has a powerful topology display to support OpenFlow and BGP for discovery and intent path creation. With constraints defined by the user, the user can create Flows and Push MPLS and Pops MPLS actions to enable NRM enable L2VPN, L3VPN, and E-Tree/line services. NRM has time-based comprehensive traffic classification for dynamic path optimization.





User Interface

The NRM application supports both an API interface, as well as a rich Graphical User Interface for end-user operation.



Key Supported Features & Standards

- Segment Routing Architecture (RFC 8402)
- PCE Based Architecture (RFC 4655)
- Path Computation Element Protocol (RFC 5440)
- BGP Labeled Unicast (RFC 8277)
- BGP-LS (RFC 7752)
- Path provisioning & Service Mapping via Netconf
- Path-recompute / reroute provisioning on topology changes
- Support for a wide variety of constraints
- User extensible constraints
- Federated & Distributed PCE
- Multi-Domain Support (Optical, Packet & OpenFlow)
- Multi-Layer Support (Integrated control of optical + packet)
- Interface for 3rd party planning tools (Eg: GNPy)

lumina networks

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.

luminanetworks.com
800.930.5144

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