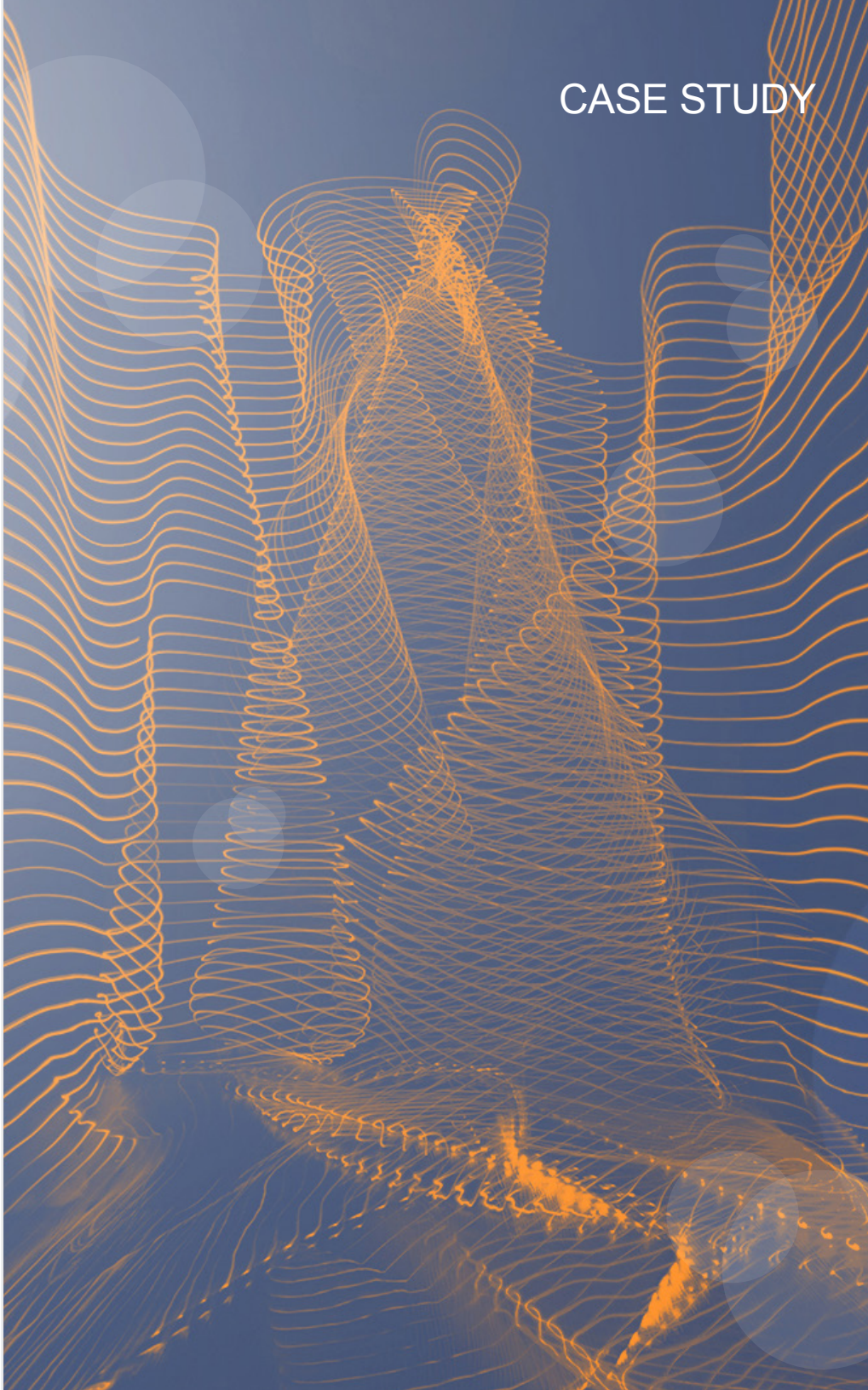
lumina networks

CASE STUDY

# Programmable Data Center Fabric for Hyperscale Networks

## Open Source Automation for Multi-Vendor Underlay



# The Project at a Glance

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| **The Customer** | • Leading Tier-1 Asia-PAC telecommunications provider<br>• Customers span 300+ cities across 150+ countries<br>• Services tailored for enterprise and communications service providers | • Geographically distributed network and nearly 200 wholesale partners make network management complex |
| **The Challenge** | **Automate the provisioning of services through Wide Area Network**<br>• Multi-vendor Automation Controlling heterogeneous resources with a mix of proprietary and standardized interfaces lent to automation difficulties | • Granular Control Difficulties enabling traffic management based on traffic type<br>• Standardization Proprietary controls limit extensibility, changes and new service additions |
| **The Solution** | **Carrier grade open source automation platform**<br>• Workflow abstraction for a range of service lifecycle management operations<br>• Built to manage mass-scale for multi-vendor environments | • Hardened for ease of deployment and usability - increase test coverage, simplified installer<br>• Extensibility with simple development framework in any language<br>• Carrier-grade open source supportability |
| **The Outcome** | • Simplified control of existing elements and ability to add new devices<br>• Streamline threat intelligence Eliminating the need for specialist “in-line” devices<br>• Ability to extended into a adjacent automation logic architecture projects | • Apply workflows to any network device with logic to handle:<br>- Complex service model configuration management<br>- Abstraction<br>- Asynchronous configuration of complex workflows |
| **The Benefits** | • Cost Savings & Improved Efficiencies<br>• Open solution enabled streamlined operations and reduced multi-vendor networks<br>• Service Agility & Network Extensibility | • Enabled service innovation teams and accelerated time-to-market<br>• Improved Network Performance & Scale Automate workflow at mass-scale improved customer experiences |

## ABOUT THE CUSTOMER

# Customer-centric innovation

The customer is a tier-1 wholesale Service Provider, industry-identified as an innovation leader that is committed to customer-centric network improvements. With Enterprise and Service Provider customers spanning 300 cities across 150 countries, and network elements distributed by geography and domain, unified operations across an end-to-end network is a challenge.

To empower continuing network transformation, the customer has put agile operational processes in place to enable the necessary software-defined projects. Projects thus far have included leveraging SD-WAN technologies to provide customers with secure and efficient access to cloud services while offloading traffic from the MPLS networks. Another project has made improvements to enable Network-as-a-Service customers with fast, low-latency and secure direct connectivity. With these advancements however, new resources were brought in further increasing network complexity and complicating service automation.



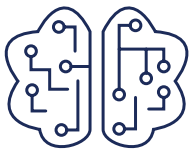
## CUSTOMER CHALLENGES

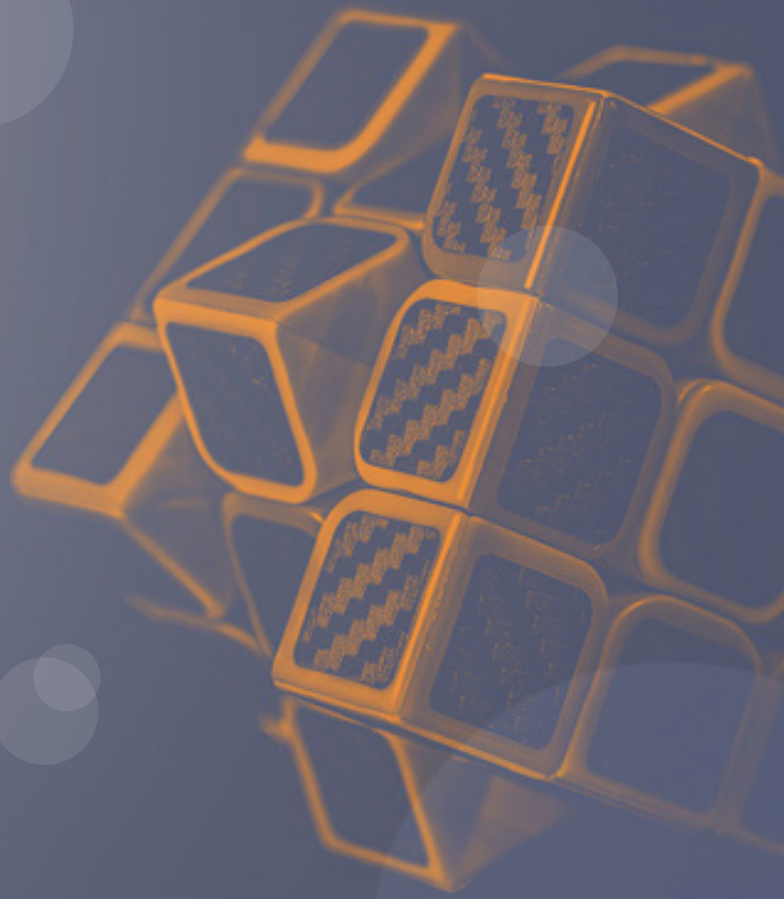
# Challenges automating across decentralized networks

Continuing the effort to create a unified programmable network, the Service Provider needed to automate the provisioning of services through a diverse Wide Area Network (WAN) - their IP Switch Fabric Manager. Supporting traffic from the service provider data centers to the customer infrastructure, automation through the WAN posed challenges:

- **Multi-vendor Automation** - Controlling heterogeneous resources with a mix of proprietary and standardized interfaces lent to automation difficulties
- **Granular Control** - Difficulties enabling traffic management based on traffic type so not all traffic is treated the same
- **Standardization** - Proprietary controls limit extensibility and changes

Headed into a world empowered by data analytics, where every network instance will be connected in some shape-or-form, the customer needed an automation solution which enabled interoperability throughout their multi-vendor network. They needed a more sophisticated platform which enabled interoperability for the purpose of streamlined automation, programmability and data/telemetry analytics.





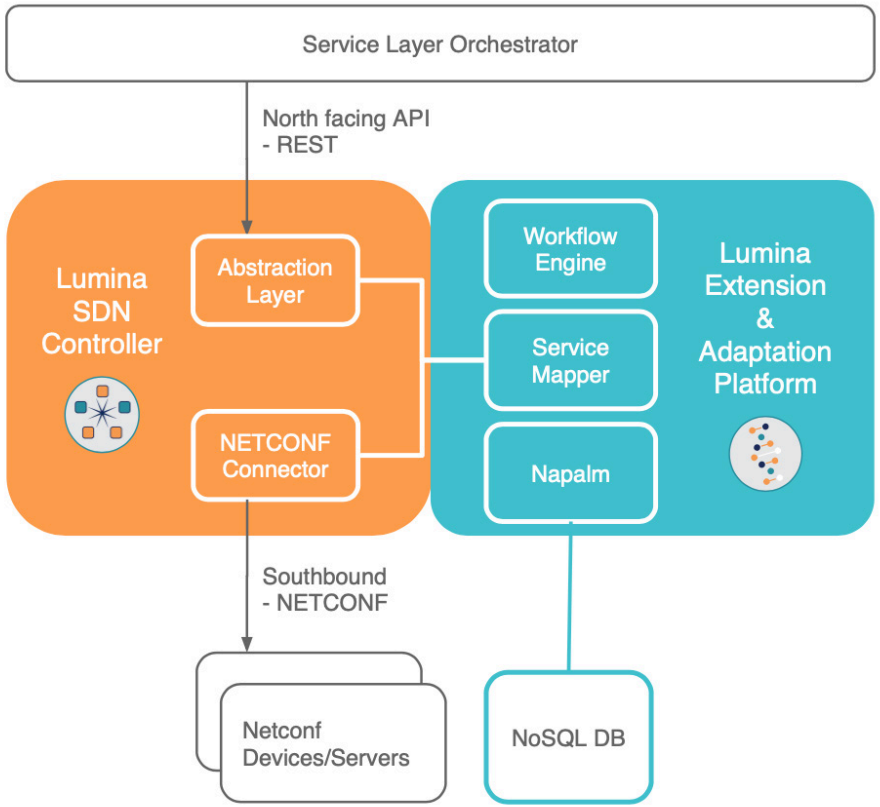
## SOLUTION

# Enabling multi-vendor network automation

Built on an open source, software-defined foundation, the customer selected Lumina's Service Automation solution for its ability to unify multi-vendor environments in an extensible way. Hardened to manage network traffic at mass-scale, the Service Automation solution creates a carrier-grade fabric manager that interworks with the existing service layer orchestrator. Performing workflow abstraction, the solution automates a range of service lifecycle management operations.

**Solution Components:**

- **Lumina SDN Controller (LSC)** - Lumina's SDN controller based on OpenDaylight
- **Lumina Extension & Adaptation Platform (LEAP)** - Lumina's extensible software framework for automation of fabric devices interactions using model-driven frameworks, in a microservices architecture
- **Lumina Service Mapper (LSM)** - Lumina's translation engine, uses json & groovy scripts to parse input and generate translated output
- **Workflow Engine (WFE)** - Lumina's Camunda powered BPMN (Business Process Modelling Notation) engine to run workflows and scripts
- **WFE Mountpoint** - Lumina's (LSC) software instance providing connectivity to the Workflow Engine
- **NETCONF Mountpoint** - Lumina's (LSC) software instance providing connectivity to the southbound elements using NETCONF
- **NETCONF Controlled Fabric Devices**
- **Customer Global Service Layer Orchestrator**



# How it Works:

The solution provided an unified control which interfaces with all northbound and southbound devices to generate workflows for service lifecycles. It works alongside the customer's orchestrator to receive service requests and interprets those requests to all southbound devices. The LSC, at the core of the solution, generates simplified standard RESTful interfaces to simplify communications with northbound devices including the customer's Service Layer Orchestrator. Southbound communication is generated by LSC with nodes achieved via NETCONF protocol.

Creating a datastore to extend to third party resources, the solution leverages an HTTP connector into an external database. This simple and scalable database is an open source component with easy integration which helps simplify integration into external data systems.

Extending the capabilities of LSC, LEAP provides supportability and extensibility to the solution. With LEAP, the solution has a self-service portal supported with streaming normalized telemetry and a microservices architecture. LEAP allows for easy integration of new devices though standardized YANG model translations and the ability to visualize the complex automation workflows required with service lifecycle operational tasks.

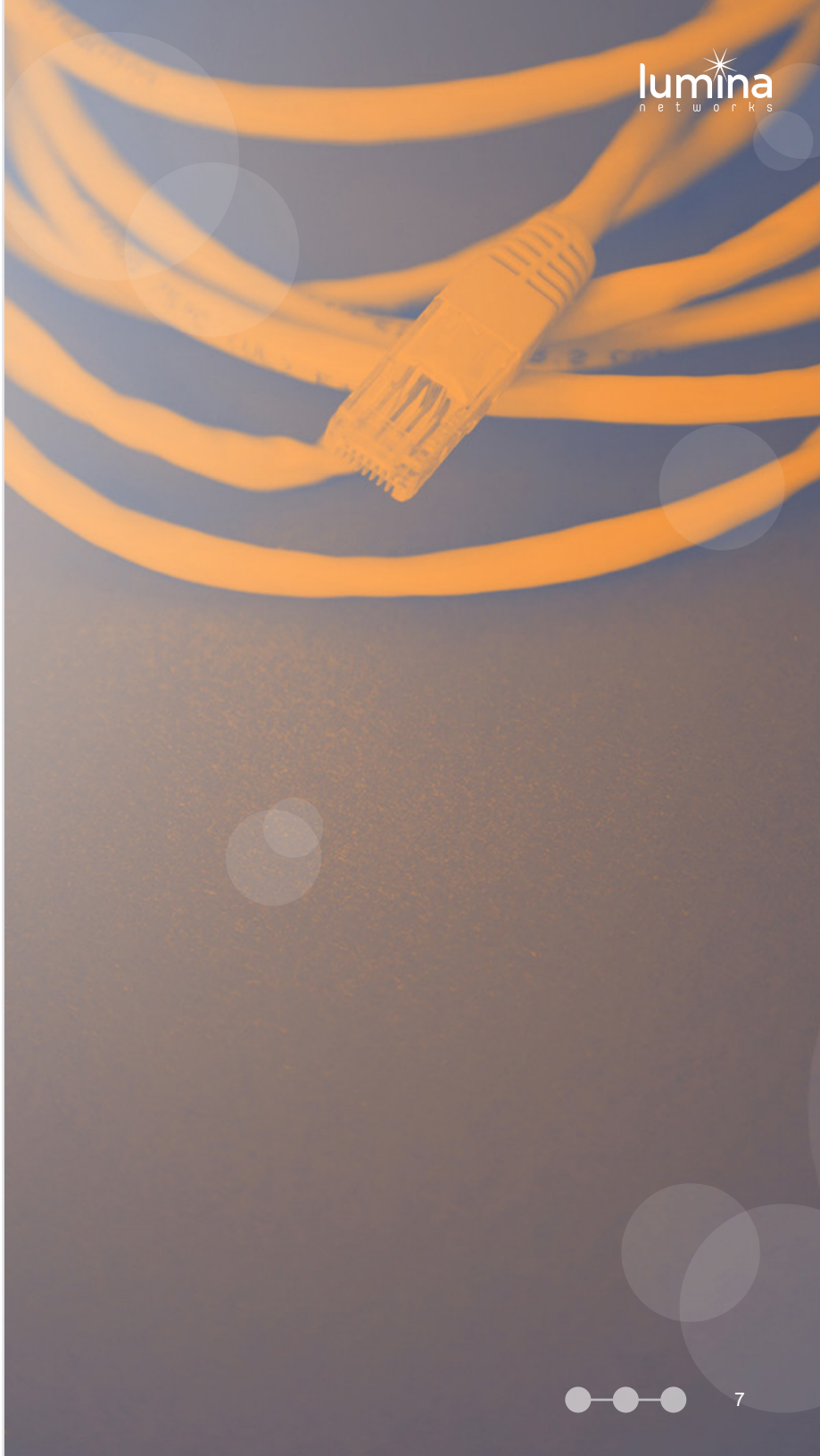
**Deployment Side Notes:**

- **EVPN Work Around** - LEAP agent provides YANG model abstraction for legacy "CLI" based devices that don't support NETCONF
- **Schema Translation** - Provide adaptability of common industry model abstractions to customer's northbound systems
- **Agile Enabled** - Solution enables agile development (teams can code any language they prefer)
- **Agile Deployed** - The solution was co-developed and deployed in Agile sprints with the customer

# WHY LUMINA NETWORKS

## Lumina is the leader in open source automation transformation

- **Experience with Network Ops & Mgmt** - Understands construct of IP, MPLS, Optical and flow-based networks
- **DevOps / NetOps Tools** - Experience in creating an agile, scalable, automated, and programmable infrastructure
- Hardened, Scalable Open Source Solutions Enable Robust Options - SDN, Automation, Visibility Telemetry
- Understand REST, APIs, JSON YANG models & XML Structures
- **Proven collaboration and integration with multiple partners** - NEPs, SIs, OSVs, OSS/BSS, VAR
- **Industry Recognized** - Best start-up to watch 2019, Best Open Source Solution 2020
- **Open Source Contribution** - Engaged in 21 open source projects, 5 of 11 active membership roles on ODL TSC, commitment to upstream
- **Culture** - Focused on collaboration, customer outcomes and business imperatives
- **Industry Collaboration & Leadership** - Active in standard bodies, Interop, TIP etc.



# OUTCOMES

## Unlocking network potential

With the Lumina Service Automation solution in place, the customer is able to:

- **Standardized Control:** Simplify control of existing and add new devices by defining common YANG models for Switch/Router configuration
- **Multi-vendor Automation:** Apply workflows to any network device with workflow logic that can handle complex service model configuration management logic, abstraction and asynchronous configuration of complex workflows
- **Improved Traffic Engineering:** Manage different types of traffic differently to optimize performance and improve resource utilization—not all traffic is best effort.
- **Streamline Threat Intelligence:** Eliminated the need for specialist “in-line” devices
- **Extensibility:** Ability to extended into a adjacent automation logic architecture projects

## Benefits

### Interoperable & Efficient

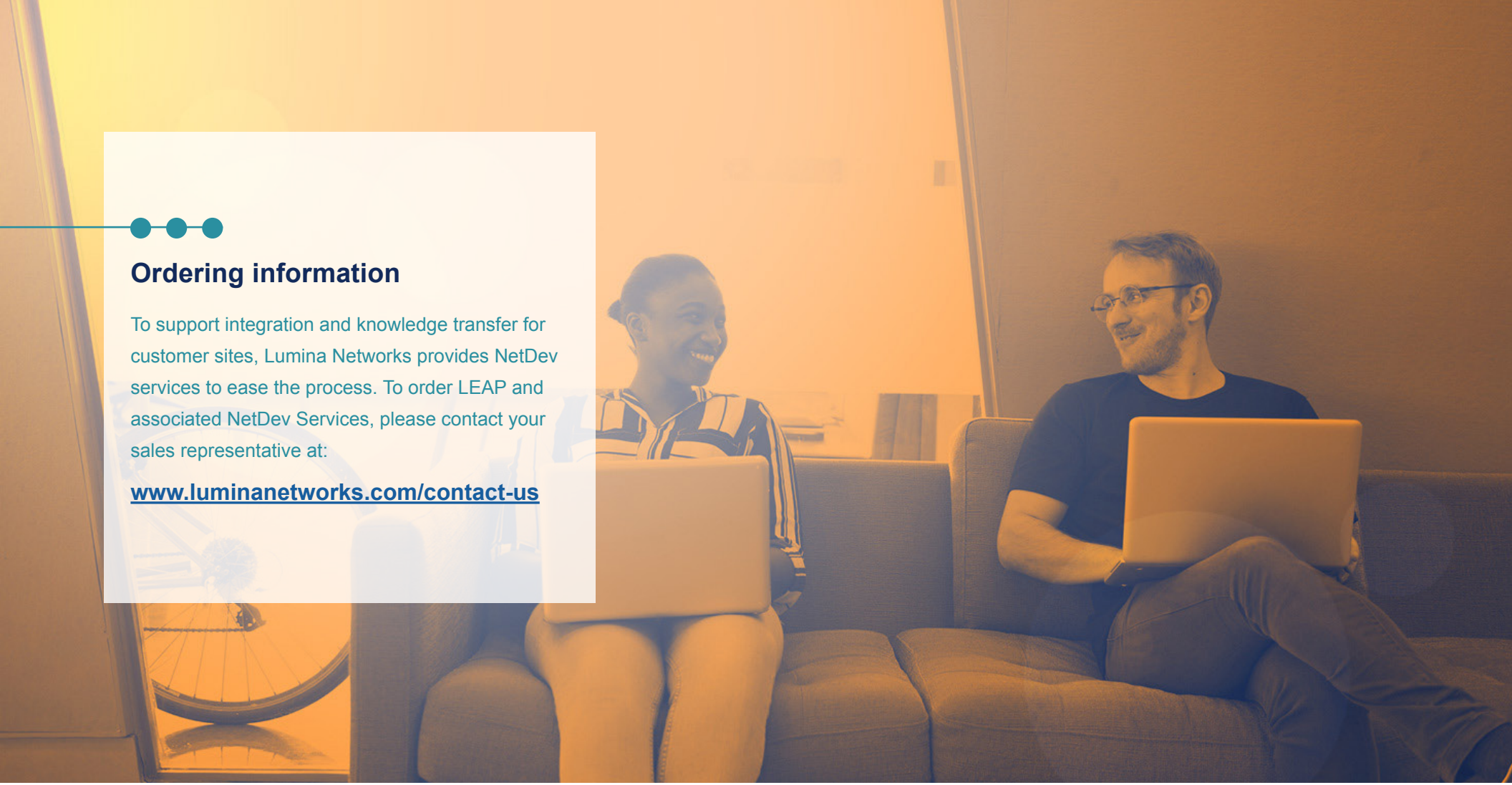
Open solution improves efficiencies and delivers cost savings for multi-vendor networks

### Agility & Extensibility

Enables NetOps innovation and accelerates time-to-market

### Performance & Scale

Build and automate workflows at mass scale to improve customer experiences



## Ordering information

To support integration and knowledge transfer for customer sites, Lumina Networks provides NetDev services to ease the process. To order LEAP and associated NetDev Services, please contact your sales representative at:

**www.luminanetworks.com/contact-us**

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### 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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