# Muse™ Multi-Vendor Orchestration

Orchestrating NEs from Multiple Vendors under a Common Umbrella

To support the business goal of creating and provisioning services rapidly, network value is shifting from network equipment to the software layer controlling NEs. Software defined networking (SDN) is becoming "services driven networking". However, implementing a powerful services and network orchestration layer is often impeded by the adapting this to different NEs from multiple vendors.

Muse solves this problem by adapting the interface protocols and data models of different vendor's NEs into a unified and abstract network data model, on which the orchestration layer operates. This separation of concerns provides network operators with a win-win. They obtain the flexibility of using NEs from multiple vendors with the benefits of Muse's advanced orchestration applications.

Unifies operations and automation

Reduces total cost of operation (TCO)

Enables mixing best-of-breed NEs

Eliminates vendor lock-in

Muse Multi-Vendor Orchestration Architecture
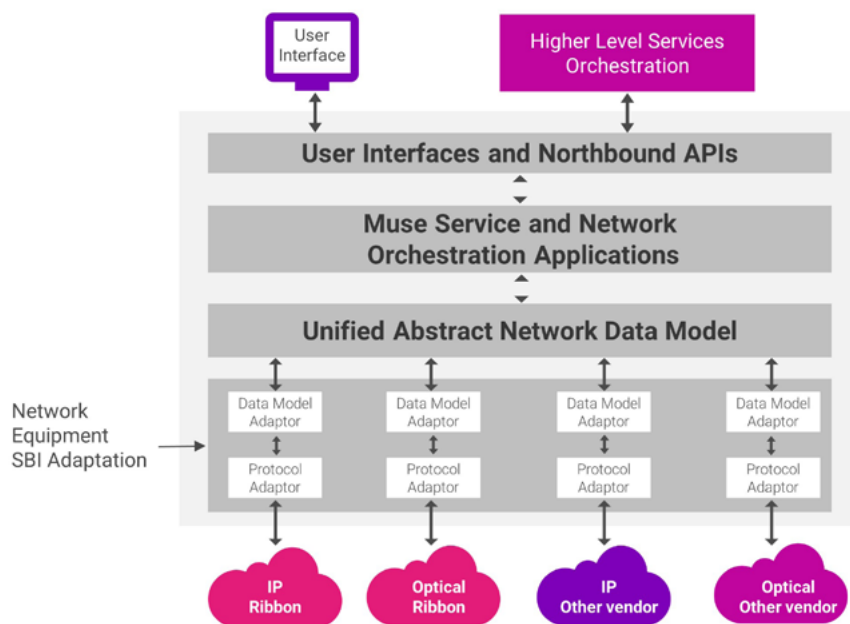
Multi-vendor Challenge

Network operators need a multi-vendor network. It enables best-of-breed equipment for the IP and optical layers from the access through the metro to the core, and it prevents vendor lock-in. However, this has been a challenge, since classically every vendor's equipment has been tied to its own management system. This complicates network operations and inhibits innovation at the control layer for creating and delivering a suite of differentiated services, slowing down network operator competitiveness and profitability.

Muse Multi-Vendor Abstraction Approach

Muse's response to this challenge is a single orchestration platform that manages equipment from multiple NE vendors. Muse's approach eliminates vendor lock-in, promotes competition, eases network lifecycle management, and above all facilitates focusing on the most important applications, namely delivering profitable services rapidly to end-customers.

Muse achieves this by creating a unified and abstract network data model on which its service and network orchestration applications operate. Muse creates the data model via an NE southbound interface (SBI) adaptation layer, which has functional modules that adapt both the interface protocols and the logical data models for the NEs.

This unifies the user experience (UX) flows, whether for a human operator or a machine-to-machine API, by handling the differences between NE vendors behind the scenes. The network operator simply needs to install the appropriate SBI adaptors for their different NEs, and can benefit from common user flows and business logic.

Muse builds SBI adaptors using a Node Designer application, based on each NE vendor's interface and data model specifications. While Ribbon engineers typically develop the adaptors, Muse's open framework also enables customers to use the Node Designer application to develop these themselves.

Using the SBI adaptors, the user is able to model transceivers, cards and chassis, and define their parameters, the technology they support (DWDM, OTN, IP/MPLS, etc.), the supported service types (L2VPN, EVPN, L3VPN, etc.), their layout (number of RUs, number of slots, etc.), and more. Once the SBIs are complete, the result is an abstract network, which frees the network operator from dealing with the specifics of each NE on an ongoing basis.

Why Muse

Muse allows Service Providers to launch new services and drive new revenue streams quickly, leveraging new technologies, such as 5G and network slicing. A suite of advanced service and network control applications empower SPs to do more, through simple service creation and lifecycle management, proactive network assurance, network optimization, and automation. Powered by a carrier-grade cloud native PaaS, Muse delivers real-time control over a programmable packet and optical network infrastructure. It guarantees that people and systems receive the right tools to monetize the network effectively through intuitive GUIs or industry-standard APIs.

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