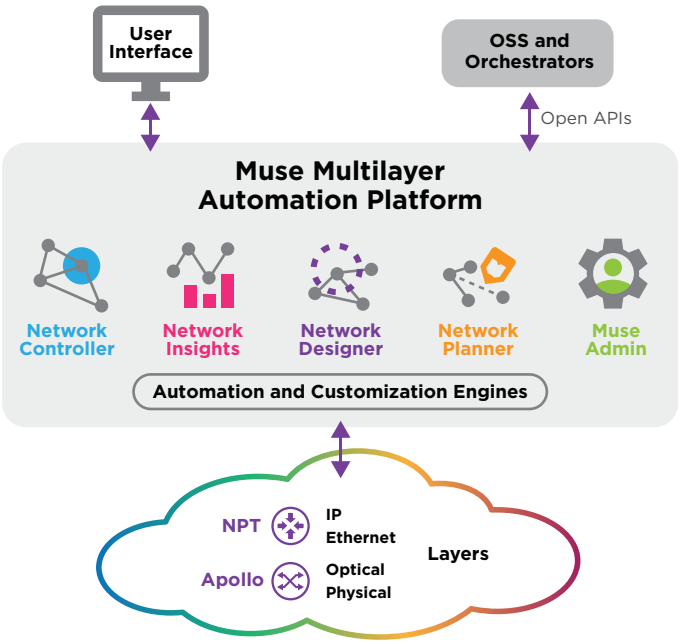
Muse Multilayer Automation Platform

Maximizing the Value of IP Optical Networks

Muse Multilayer Automation Platform delivers real-time control over Ribbon IP and Optical networks, providing people and systems with the capabilities they need to maximize the value of network investments. It also integrates with OSS/BSS or higher level orchestrators via northbound interfaces, and can integrate 3rd-party network equipment for multi-layer end-to-end inventory, topology, fault management, and service provisioning.

Muse speeds up services creation and provisioning, assures that services meet commitments, and reconfigures the network on failures. Additionally, Muse streamlines network operations, optimizing capital outlays and reducing costs. To this end, Muse integrates network planning with equipment commissioning, continually analyzes and optimizes the use of network resources, and prevents failures before they happen or sectionalizes them quickly when they do occur.



Muse is deployed on a cloud native infrastructure that can be right-sized for each network operator, and is equipped with low-code toolsets that facilitate adding automation, customization, and multivendor integration to its solutions.

Challenge	Muse Multilayer Automation Platform Solution
Seamless planning to implementation	Iterative planning for greenfield and brownfield networks allows balancing between performance and investment. Plug-and-play commissioning ensures rapid and error-free installation and turn up.
Flexible service creation and rapid provisioning	Template driven service creation processes rapidly define and provision services; includes tools to design new templates from scratch for services differentiation.
Service and network assurance	Continuous network and services monitoring plus analytics identifies issues before they become service affecting. Dynamic restoration recovers from outages using shared resources.
Streamlining operations and reducing costs	Low-code tools enable practical automation at your own pace from human-assisted to closed loop. Operates on an integrated multilayer IP Optical network view.
Multivendor OSS and NE environment	Standard and open NBIs and SBIs enable integration with higher level orchestration as well as other vendors' network equipment.
Evolvable deployment and customization	Deployed on a scalable and secure cloud native infrastructure, with containerized microservices based applications that permit continuous development, customization and delivery.

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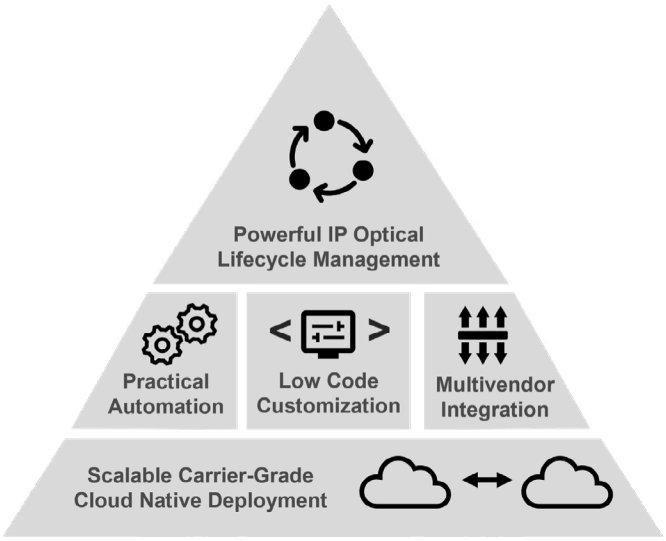
Muse Values Pyramid

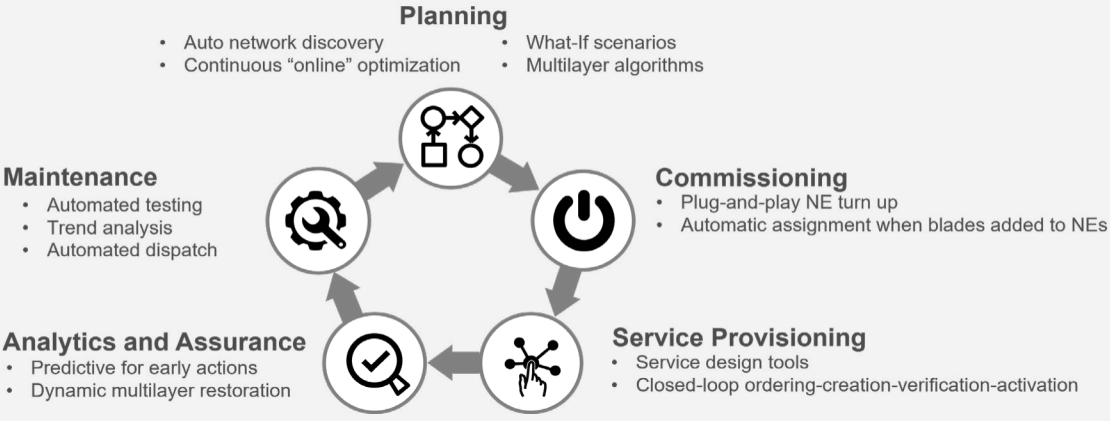
At the top of the pyramid are the applications that Muse uses to fulfill its primary mission of providing complete and powerful lifecycle management for IP and Optical networks. These applications cover network planning, design, control, and analytics, and maximize the value and efficiency of these networks. Underlying the lifecycle management applications are utilities that provide added value for automation, customization, and integration into multivendor environments, based on individual network operator needs. At Muse's foundation is a scalable, secure, carrier-grade cloud native infrastructure that integrates with, and ensures longevity within, modern operating environments. We explore this pyramid in the remainder of this brochure.



Muse Values Pyramid

Complete and Powerful IP Optical Lifecycle Management

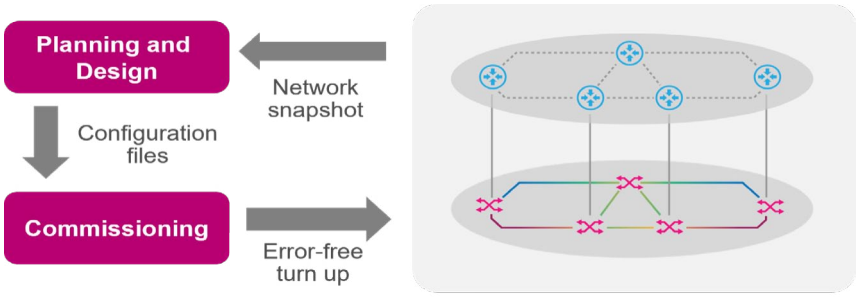
Muse fulfills its core mission of providing lifecycle management for an IP and Optical network infrastructure via unified, intuitive and customizable user interfaces. Within administered limits, personnel can jump to any point in the lifecycle for any operations function over any part of the network, and can telescope in and out for different levels of detail. Muse focuses on reducing management complexity, and simplifying the training and day-to-day activities of NOC personnel.



Planning and Commissioning

Muse network planning optimizes for a balance between traffic capacity and network availability while using a minimum set of resources, and can be applied to both greenfield and brownfield networks. For brownfield networks, Muse works on actual configuration data it uploads from the network. Planning starts with a service demand matrix, then state-of-the-art algorithms optimize on user-selectable factors such as cost, latency, and OSNR, and users can further telescope-in to plan selected portions of the network critically. Simulation testing analyzes design robustness, such as how to handle CIR services in the event of failures, and enables iterating on the design.

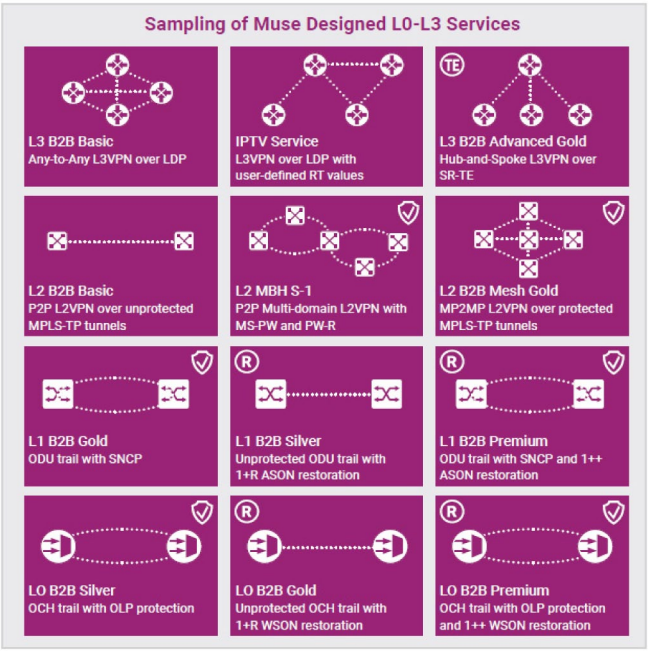
Once a plan and design is complete, Muse creates detailed files for site installations, and downloads configurations directly to the equipment for error-free plug-and-play turn up.



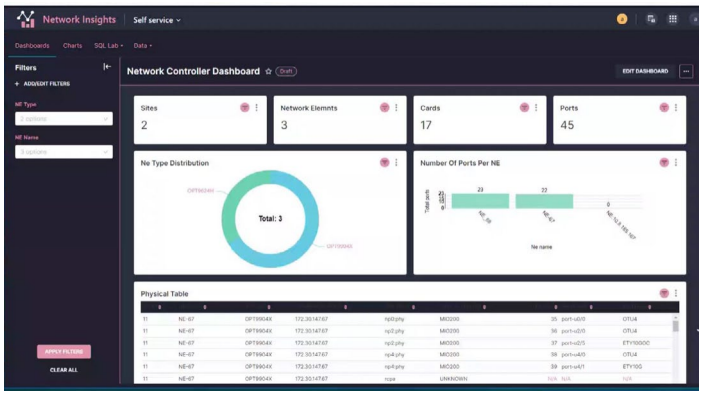
Multilayer Network and Service Provisioning

To meet an ever increasing range of end-user needs, Muse combines the creation of multilayer network slices with the provisioning of services to run on these slices. Network operators and service providers can tailor specific performance and availability guarantees for each slice and service individually, while extracting maximum throughput from a common network for the entire complex mix of slices and services.

Ready-to-use templates can be applied to individual customers, slices, and services, and new templates can be designed from scratch. The templates combine powerful abstraction capabilities to create wide-ranging “connectivity configurations” using different performance and reliability parameters, with real-time control of underlying network resources to provision them. CRUD controls are available to update and modify slices and services, as needed, to respond to evolving customer needs.

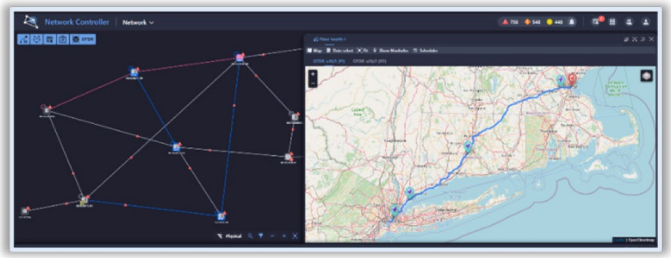


Service Assurance, Insights and Analytics



Muse provides an advanced business intelligence engine that "stays on top" of the network to ensure that changing conditions do not affect services. This allows better utilization of capex, and provides responses to business questions that improve the NOC efficiency.

Muse measures physical and logical inventory, performance, utilization, and other KPIs, both in real-time and against historical trends, to identify and address degradations early on, before they impact services. It exports analytics reports for human action, and feeds data to automation engines that adjust network configurations proactively for peak performance and efficiency. Muse also works in conjunction with network-based service restoration schemes to prioritize services with high availability SLAs.



Network Health and Maintenance

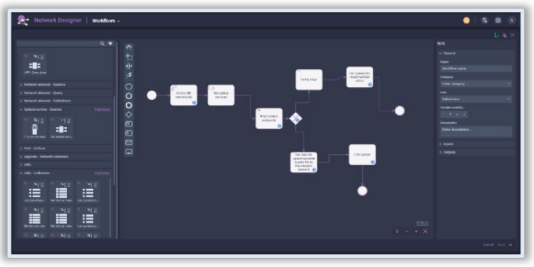
Muse signal health provides comprehensive monitoring, reporting, trending, and troubleshooting. It maintains records of all data collected, providing visual representation of optical impairments.

Muse fiber health provides advanced OTDR capabilities that detect trends by comparing against historical results. It also integrates with GIS systems to present events on a geographical map, together with ducts and manholes information, to direct accurate dispatch of repair personnel.

Value Added Utilities

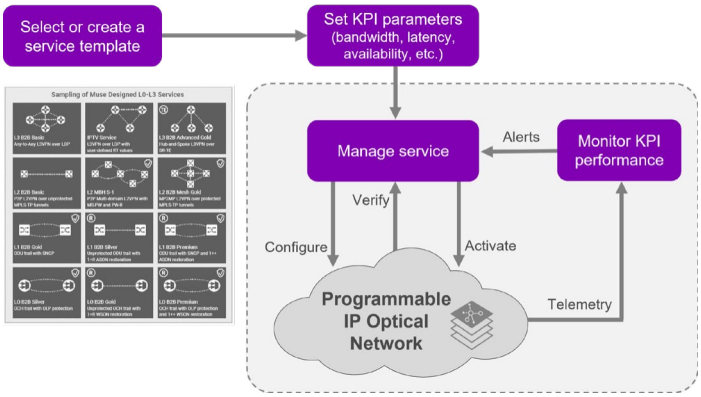
Practical Automation

Muse allows implementing automation at your own pace, and from human-directed to full closed-loop.



Workflow automation enables running a set of tasks and processes in the network according to a defined sequence. Operators can define triggers and schedules that will activate the workflow execution. This minimizes human mistakes and reduces OpEx by automating NOC operations such as troubleshooting, routine maintenance, and bulk operations.

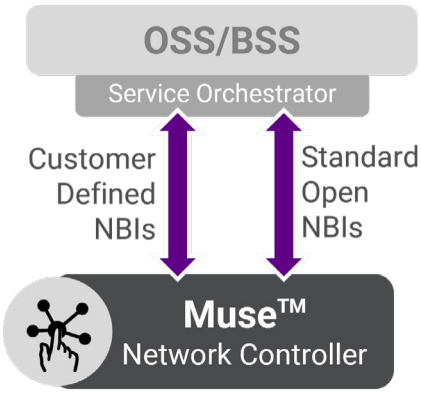
An example of closed loop automation builds off service provisioning discussed above. It takes a populated service template and automatically validates the service's KPIs using pre-defined assurance tests prior to turning up the service. This increases revenues by facilitating the sale of services with performance guarantees and speeds time to market.

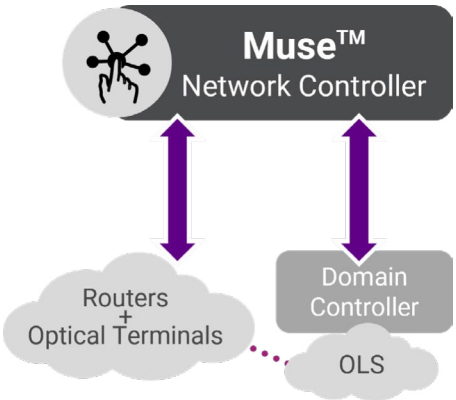


Multivendor Integration

Muse integrates with OSS/BSS or higher level orchestrators using standard or customer-defined northbound interfaces. This enables end-to-end automation, further speeding up provisioning processes and reducing expenses.

Muse can also integrate 3rd-party network equipment for multi-layer end-to-end inventory, topology, fault management, and service provisioning. This enables the benefits of a multi-vendor disaggregated network architecture, and facilitates network migration by extending the use of existing assets.



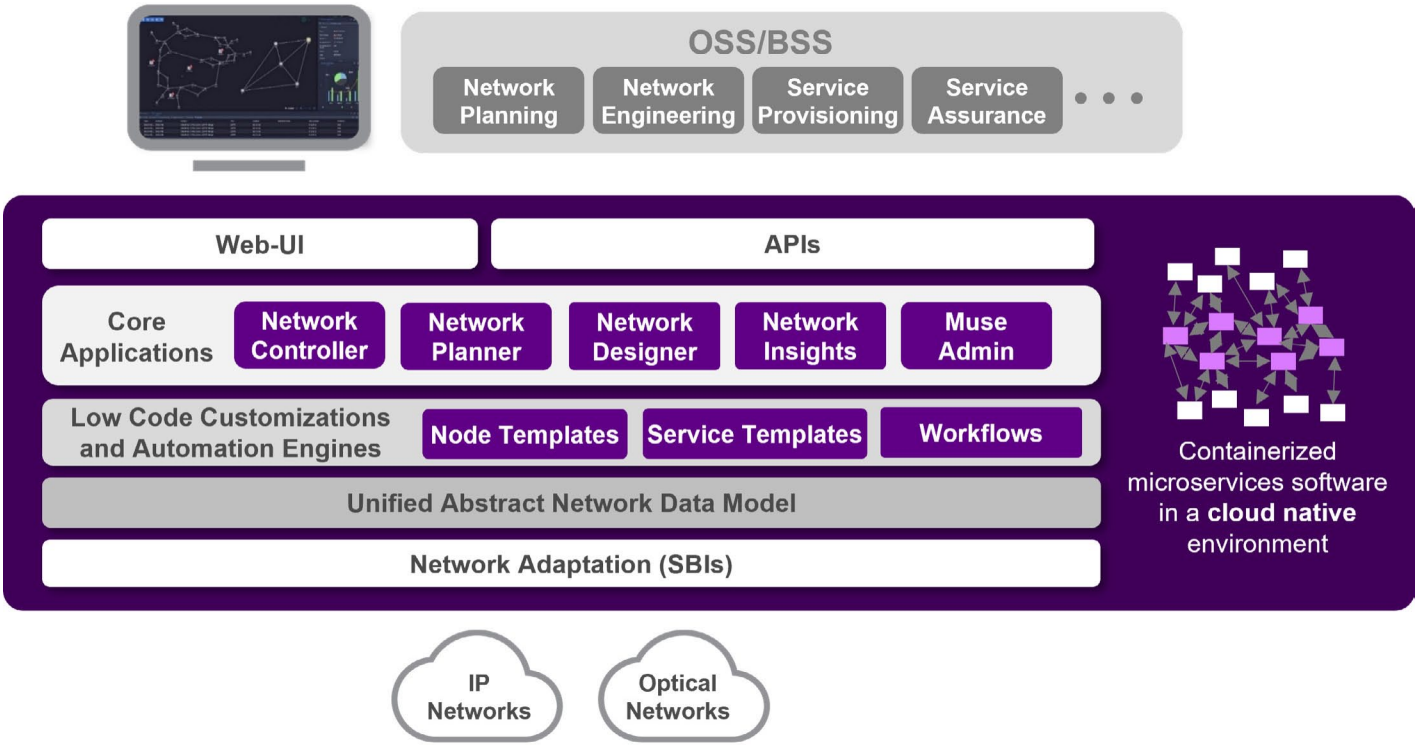


Carrier-grade Cloud Native Deployment

Muse is built on a modern cloud native software architecture using containerized microservices applications software, supported by a foundation of broadly available technologies for databases, messaging, security, administration and more. This brings multiple benefits including faster application development, enhancements, and customization using CI/CD processes, easier integration within a telco or enterprise cloud, and multiple layers of security against hacking attacks and internal unintentional misuse.

Muse can extend this architecture to be deployed over multiple sites with geo-redundant active-standby synch to meet the highest carrier-grade availability requirements. It can also be streamlined to a minimal lightweight configuration for smaller installations.

Above all, by employing a cloud native architecture, Muse is eminently tailorable to fit specific IP and Optical network management needs, to maximize the value and efficiency of the investments in these networks.



Contact Us Contact Ribbon to find out how to exercise SDN control over your IP Optical networks