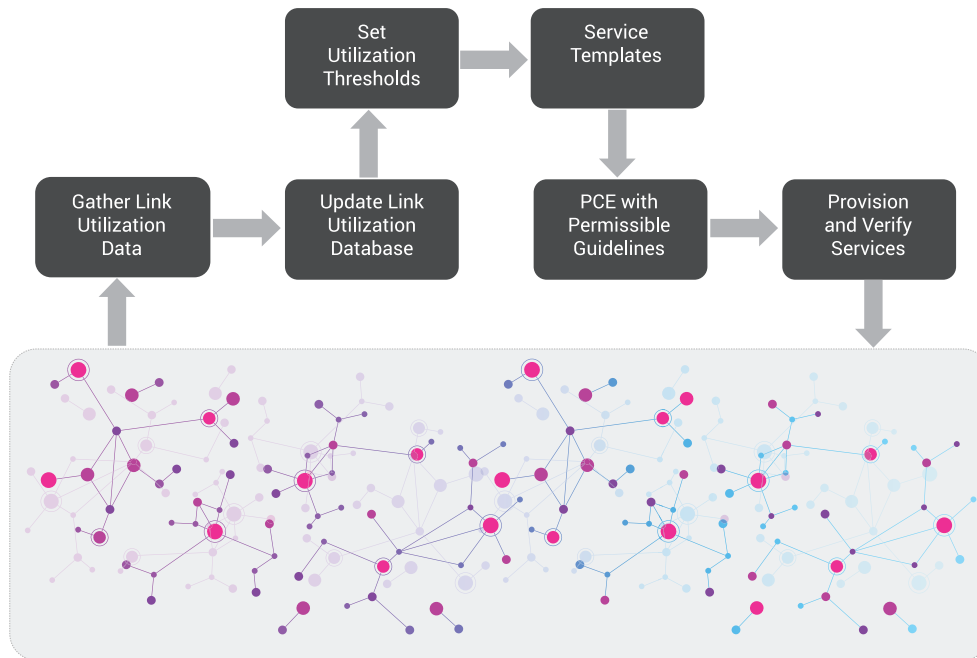




# Muse™ Service Provisioning with Optimized Link Utilization

## Service Provisioning Based on Accurate Views of Link Utilization

For efficient network operation, it is optimal to distribute services traffic evenly across the network. Specifically, links should not be loaded to near maximum utilization, as this can lead to congestion and make it difficult to re-route services in the event of failures. Muse SDN Orchestrator achieves these goals using closed loop automation, whereby it gathers link utilization data continuously, and uses this as part of its path computation algorithms in assigning services with primary and alternate links.



Muse Closed Loop Service Provisioning with Optimized Link Utilization

## Provisioning Challenge

A network operations goal is to spread services evenly throughout the network, to avoid congesting links. Today, network operators often resort to manual intervention as part of the service provisioning process, inspecting links utilization and selecting uncongested links. This is a time-consuming process open to human transcription errors, and the link utilization data may be out of date. This leads to cases where services need to be re-provisioned. Moreover, as errors accumulate, the network starts using resources unevenly, necessitating adding capacity before this is needed.

## Muse Closed Loop Service Provisioning

Muse builds the service provisioning process around ready-to-use templates for a broad range of L0 to L3 services. These combine powerful abstraction capabilities to create the services with real-time control of underlying network resources to provision them. The templates are customizable, and CRUD controls are available to update and modify services, as needed, to respond to evolving customer needs.

Muse uses real-time SDN connection control with cutting-edge path computation (PCE) algorithms to provide high-performance data paths between endpoints, and makes it easy to specify backup paths in the event of failures for service guarantees. Services are verified automatically prior to activation.

A key input to path computation is link utilization. All links are monitored on a daily basis, and any link that crosses a pre-defined utilization threshold is filtered out for additional use. Specifically:

- Muse gathers link utilization data on a daily basis, and on a customer-definable moving average basis, stores the average utilization value of each link.
- For each Service Template, in the PCE Profile, users can define utilization thresholds for two CIR values. For example,
  - For B2B services of up to 10Mbps, do not use links utilized over 90%
  - For B2B services of over 10Mbps, do not use links utilized over 70%
- The CIR and utilization percentage are configurable in the service templates, and can be different for different services
- During provisioning, Muse's PCE only selects links that do not exceed the utilization thresholds.

### 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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Contact us to learn more about Ribbon solutions.