Orchestration barriers in networks

The networks of today need to deal with an array of new application requirements which were not present before. Some of those new requirements could be characterized as follows:

- End Points – Physical and virtual end-points, as against a simple physical termination

- Control – Distributed and centralized control architectures, as against a simple distributed only architecture

- Workload – Virtual workloads capable of migrating at will across different points of presence, as against a simple fixed workload with predictable traffic patterns

- Abstractions – Expected to provide abstractions at service level, as against an accepted practice of manually-intensive network resource level configurations

However, most OEMs offer solutions to the above via forklift upgrades of their existing networking gears, or via expensive software upgrades, that will force months of qualification cycles to prove the stability of the new software. Neither provide a viable option for the network operators to build SDN like orchestration system on their existing network, to deliver new services.

Separating orchestration layer from networks

With different business applications having different needs, and with varied ways of delivering services over the network, there is no single way of building flexible orchestration systems that can cater itself to every possible end application. With the limited programmable infra an existing network can offer, it is not very straight forward to structure new services based on what the network can natively offer. However, it is indeed possible to come up with meaningful abstractions for the legacy networks that will enable construction of orchestration applications catering to different business needs.

One needs to ensure that the abstractions that are being proposed adhere to some form of industry accepted standards, so that the investment that goes in building these orchestration systems are well protected, and stay independent of changes at network level.

Standard models for network abstractions

While there are many ways of abstracting network services and resources, the industry is migrating towards using YANG as a standardized modeling language. While it is good to have a popular choice of modeling language, it is also equally important to standardize on the actual models that are developed using this language. The initiatives happening in IETF and the Google-led OpenConfig forums help accomplish this, to come up with a single view of how network abstractions can be viewed, independent of vendors, devices or network operating systems. One can offer reasonable guarantees that any orchestration system that is built using interfaces defined by these standards based models is well insulated from changes that can happen in the network layer

While YANG is the popular choice for data and application behavior modelling, TOSCA is a popular choice for service template definition in the cloud orchestration world. Cross Domain Services can be expressed using TOSCA, and is widely adopted in the industry. The ETSI specifications for NFV MANO proposes standard data models for the various interfaces involved in managing and orchestrating NFV infrastructure, which can be expressed using YANG or TOSCA.

Symphony Suite – Orchestration enabler for multi-domain Networks

Nuviso's Symphony Suite of products deliver the ability to build SDN like orchestration systems for any type of network, without having to make software or hardware upgrades to existing networks. The suite offers standards based North Bound APIs that enables orchestration of both physical and virtual networks. The data models for physical networks are derived from IETF / OpenConfig yang specifications, and the data models for virtual/cloud networks are derived from the ETSI specifications. The platform is very agile and dynamic. Newer services can be added on-the-fly, thereby enabling upgrades without impacting existing network operations.
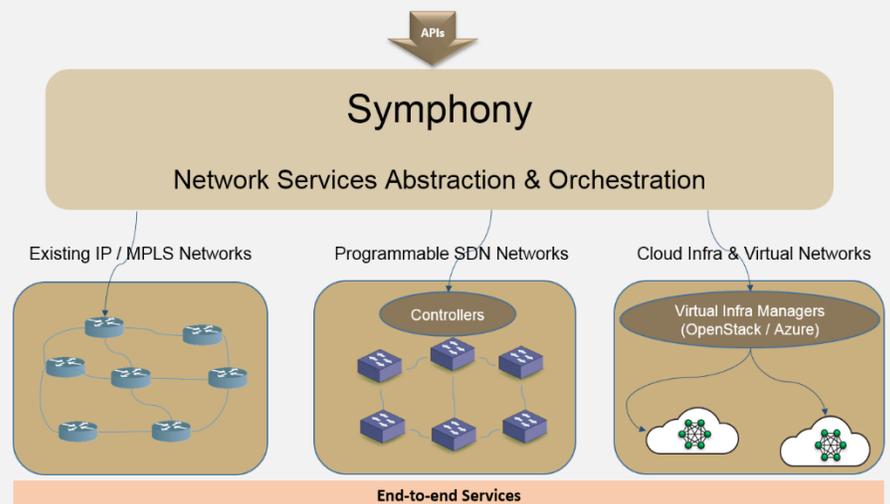
The Symphony Suite also supports rich set of configuration management functions. Using this, the operator can get insights into network configuration change data on a time-series basis, thereby resulting in a rich set of analytics that can aid further decision making progress.

In summary, the Symphony Suite enables seamless management and orchestration of the physical and virtual network domains through a single pane of glass.

Contact

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