Programmable Transport: Use Cases Emerge as Capability Improves

EXECUTIVE SUMMARY

In order to take full advantage of network function virtualization (NFV), operators will need to be able to dynamically set up and tear down carrier-class transport connections between their data centers, their customers and third-party cloud resources. They will need the network layer to respond appropriately as the function and application layers fluctuate to deal with rapid changes in customer behavior and requirements.

In the meantime, programmable transport is opening up new opportunities – more limited in scale – for operators. As well as using programmable transport to support their NFV initiatives, operators can also use programmability to create interesting new services and open up new market opportunities. These include not only the provision of enterprise bandwidth on demand, but intrinsically-linked network and cloud services that take cloud brokerage to the next level.

Operators are only just beginning to leverage the flexibility of network programmability. Early services based on programmable transport networks – such as bandwidth on demand and flexible data center interconnect – are emerging and will spread quite quickly in competitive markets as operators vie for customer accounts. In less competitive markets, operators will be slower to act, perceiving the risk that usage based billing will inevitably deliver less revenue than customer bandwidth deployments scaled to meet peak rate requirements.

Services will evolve in complexity as operators realize they can act as brokers delivering both the bandwidth and the cloud services in a joined up way that cannot be matched by cloud services companies unable offer on-demand, SLA-backed access to their facilities or by operators not providing usage-based access to third-party cloud infrastructures.

SDN is an important part of the mix as far as network programmability is concerned, but it is not the only game in town. Other protocols, such as Netconf and Yang, are increasing in importance when it comes to pushing control instructions down to network elements, such as switches and routers, and some vendors are backing other approaches, such as segment routing to control core network behavior.
Programmable Transport: Use Cases Emerge as Capability Improves examines SDN-enabled bandwidth-on-demand/NaaS solutions. It reviews what is available and practically doable now, offering insight into some of the services that have been launched. It considers what hurdles are still sitting in the way of achieving truly dynamic, multiservice, virtualized multivendor networks supported seamlessly with dynamic, automated bandwidth on demand, as well as what is capable of delivering carrier-class connectivity across operator domains, as and when required. Finally, the report compares the solutions offered from leading transport network and data center networking vendors, contrasts their approaches to the market and provides profiles of 12 key players.

In order to support bandwidth on demand, operators must make their networks intrinsically more programmable. They must give customers the facilities to buy services, turn them up, down or off, and to set quality thresholds and behavior patterns. Operators must be able to enforce behaviors in the network, with the level in the network determined by the types of service purchased. The following excerpt shows the possible evolution path for transport network programmability from a technology and functionality perspective.

**Figure 1: Evolution of Programmable Transport Networks**

![Evolution of Programmable Transport Networks](source: Heavy Reading)

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