

Network virtualization

Enabling novel business models in a dynamic market

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Network virtualization: Enabling novel business models in a dynamic market

Network virtualization will be a key enabler to help operators deliver a wide variety of quality services for end users, explore new business models and drive down costs.

The focus of the communications business has undergone a fundamental shift, with network basics such as coverage and availability no longer enough to differentiate operators in an increasingly crowded and dynamic marketplace. Users today expect an excellent on-line experience every time, across a wide range of services and devices. Operators have therefore broadened their focus from owning and operating networks to include the delivery of a superior customer experience.

At the same time, the boom in data traffic volumes is putting more pressure than ever on operators to invest in network capacity while driving down the cost per delivered bit.

And it's not just the volume of traffic that's changing. Shifting traffic patterns are also making demands on today's networks. For example, the needs of enterprise

customers are more dynamic and unpredictable from an operator's perspective. An enterprise may require a high bandwidth for a limited time span, or may want to add or withdraw new locations within their WAN, for instance. This creates a range of different demand patterns and service level agreements (SLAs) on the same network.

All this is leading to more innovation in business and operational models among network operators, with novel approaches such as wholesale, network sharing and outsourcing gaining traction.

What is network virtualization?

Network virtualization is a game-changing approach that enables operators to meet all these evolving demands, giving them the ability to scale network capacity on-demand and adopt a range of innovative business models.

Virtualization essentially uncouples the network hardware and software by introducing a virtual resource manager layer to mediate between the network elements and the software-based network controllers. This technology is also frequently referred to "software-defined networking (SDN)".

In this set-up, each virtual network has its own virtual network controller and can independently specify the end-to-end quality of service (QoS) and quality of experience (QoE) it expects for its different customer segments. The resource manager can automatically shift resources between services on-demand to meet capacity requirements. Resource allocation can be extremely agile, enabling, for example, an operator to access extra resources to cover a major event.

Supporting new business models and new value-chain positions

Network virtualization technology can help operators differentiate their offerings while developing new business models. By uncoupling the network hardware and software, virtualization enables operators to customize their networks to provide different SLAs to suit a range of potential partners and end users.

Take the example of online gaming. Gaming services are highly sensitive to latency and other QoS issues. Gamers therefore need a guaranteed level of service from their providers to enjoy a real-time interactive experience. Operators could offer appropriate SLAs by partnering

with the games developer through a fully optimized infrastructure, with IT resources positioned as close as possible to users. The developer can then buy connectivity as a service from the operator, complete with the appropriate SLA.

In addition, the evolving business ecosystem in this virtualized environment will enable different players to position themselves in a variety of possible new roles.

- Mobile/fixed network operators
- Network as a service providers
- Virtual mobile/fixed network operator
- Virtual wholesalers
- Exchange brokers
- Resellers
- Virtual network providers
- Resource providers

Build for the future – networks merge with data centers

Most of us are familiar with the use of cloud services for data storage and IT services, but users also need connectivity in order to access these services. Network

virtualization makes this connectivity easier, since it allows operators to set up multiple channels over the same infrastructure and use whichever network layer is the most appropriate to deliver the required QoS to suit a particular service and customer.

The concept of cloud-based services could also be applied to network virtualization by centralizing network resources in one or more data centers. In other words, connectivity can join data and services in the cloud.

As we have seen, some applications are especially sensitive to factors such as latency, which can be minimized by locating the content or the service close to the end user. The deployment of several physically-dispersed data centers within the cloud would enable operators to address this.

Some operators are already offering their own cloud-based services, such as AT&T, Deutsche Telekom, BT and Verizon. The network and data center effectively merge as a holistic offering for anyone who wants to deploy new services. Services targeting enterprise customers are leading the way on this, with the concept yet to take off in a big way for consumer services.

Network sharing benefits everyone

Operators are under increasing pressure to scale, run and manage their networks more efficiently, as well as extracting more value from them. They are looking for ways to share network infrastructure in order to control their costs. Network virtualization enables operators to share mobile access, backhaul and transport network resources, while still competing via service differentiation.

From a total cost of ownership (TCO) perspective, two operator partners can enjoy overall savings of 40% through sharing.

Of course, network sharing often means working in partnership with natural competitors, so it can make sense to bring in a trusted third party to operate the shared network under a managed services agreement. In fact, bringing in a specialist can also be so beneficial that it can shave a further 10-15% off operating costs.

Network virtualization reinforces these benefits, because it gives each operator with a stake in a shared network full control over their portion of the resources. The ability to manage their own resources independently in turn enables the partners

to differentiate effectively from one another, even in a shared environment.

Although the drivers for network sharing may be most obvious in mobile networks, many of the benefits of network sharing and virtualization can extend beyond the radio access network (RAN). In transport and backhaul, as well as fixed broadband, operators can opt to share infrastructure. Next generation optical access (NGOA) networks, for instance, enable the sharing of fiber access with individual wavelengths

being allocated to customers to create a virtual optical access network.

Conclusion

The communications industry has always been fast-moving and unpredictable, but some things are certain. We live in an “anytime, anywhere, any service” world of growing user expectations and ballooning traffic volumes. These developments demand major network investment, as do the arrival of new, faster technologies such as LTE and beyond.

At the same time, operators need to drive down the cost per bit, and that calls for innovative solutions such as network sharing, cloud-based operations and radically increased automation.

Network virtualization will be a key enabler for operators looking to meet any or all of these demands however the communications market develops over the next few years.

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