

Virtualisation and Network Services

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Abstract: *Virtualisation is a technology in which an application, guest operating system or data storage is abstracted away from true underlying hardware or software. Server virtualisation is one virtualisation technology which uses a software layer called a hypervisor to emulate the underlying hardware. This includes the CPU's memory, I/O and network traffic. The guest operating system with true hardware is now doing so with software emulation of that hardware and the guest operating system has no idea it is on it's on virtualised hardware. While the performance of this virtual system is not equal to the performance of this operating system running on true hardware, virtualization works because most guest operating systems and applications do not need the full underlying hardware.*

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1. Manuscript Body

A virtual machine is a software computer that like a physical computer runs an operating system and applications. A computer platform is an underlying computer system on which application programs can run. A hypervisor is a function with abstract, isolates operating systems and applications from the underlying computer. Though initially meant for server virtualization, this virtualisation has spread to applications, networks, data and desktops. Types of virtualization include network, storage, server, data, application and desktop

Earlier services have been the direct product of cooperative behaviour of systems of network devices. The devices communicate with each other to learn network topology, status and the location of endpoints in a process called adaptive discovery. The purpose of the network is to build services and that should be true whether the network is virtual or real. Services divide into three basic categories – connection services, on network hosting services and end point services. Connection services move traffic among end points, hosting services are service offered on the network (websites and cloud) and endpoint services are things like firewall, dynamic host configuration that are usually at end point and appear to be a logical part of the connection services. Virtualisation creates a service triangle. One apex is the services that are used/purchased, another is the features, functions that create these services and third is the resources that support these features/functions. In traditional networking all three of these are linked into one by device-specific network services. In virtual networking, all three have totally dynamic relationships.

In real networks connectivity is created by a set of cooperating devices dedicated to the network. We build Ethernet networks from Ethernet switches and IP networks from routers. Virtual networking partitioned these real networks so that each partition appeared to be real thus hosting virtual networks on real networks. Virtualisation is a reduction in the number of network devices needed to provide services to consumers and businesses. Virtualisation moves away from proprietary implementation of service features in appliances/devices and instead towards software and an open feature model. All this could change how networks are built. As per OSI model, network has three

layers- physical, datalink and network. Most of the capex and opex costs are associated with levels 2 and 3 (Ethernet and IP) and virtual networking would replace these layers with cheap forwarding elements and server- hosted software components.

All the service drivers for virtual networking reduce to dynamism. We build networks in terms of connectivity and features and personalize network services to every workgroup, application, branch office or even user. Access to everything is explicit- one has to be joined to a resource to see it whether the resource is human or IT element. This is agile and optional as we can build a traditional open virtual network or build one that's totally access controlled and feature regulated. Combining virtual networks in branch offices and workgroups with virtual networks per application could allow enterprises to connect workgroups and users to applications only where allowed. It revolutionises notion of security. Collaborating teams even in different companies could share tools and information without actually connecting their company networks- only specific users would share specific tools and data.

References

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Author Profile

Jyoti Madabhushi, B.E, M.S. has got more than 25 years of work experience in IT industry with more than one and a half decade experience in project management. She has worked in various capacities from being a hands on technical person to project manager, program manager, portfolio manager to strategic business unit head mapping her portfolio to the changing trends in IT.