Microsoft Hyper-V Network Virtualization and the BIG-IP System

By virtualizing their networks, service providers and enterprises can realize improvements in performance, agility, and scalability—and lessen the burden of management. Working with Microsoft System Center Virtual Machine Manager, the F5 BIG-IP system acts as a high-speed, service provider–class NVGRE gateway, while also delivering a host of essential application services.

White Paper

Introduction

Network complexity is increasing every day as service providers and enterprises attempt to manage both hybrid cloud networks and traditional data centers. Network virtualization can lessen this complexity by allowing these organizations to move applications and data seamlessly between traditional networks, public clouds, and private clouds. In addition, virtualization simplifies infrastructure management while maintaining the security and performance requirements that customers demand.

Organizations managing traditional data center architectures struggle to provide the level of on-demand services that today's business climate requires. By virtualizing the network, these organizations can solve several pressing business challenges. Network virtualization increases both data center agility and efficiency by simplifying the movement and provisioning of applications. Virtualization also satisfies the demands for simplified network management through self-service provisioning and automation. Finally, network virtualization reduces time to market—as well as speeding the processes of modification and customization—allowing enterprises and service providers to easily deploy new services and applications across the network.

Higher ROI through Network Virtualization

Through NVGRE (Network Virtualization using Generic Routing Encapsulation), your organization can now run multiple, overlapping tenant networks on the same physical switching fabric, thus providing dynamic, on-demand services within an agile infrastructure. Microsoft Hyper-V Network Virtualization (HNV) delivers policy-based, software-controlled network virtualization that eases the burden of management and enhances flexibility and scalability to deliver a higher ROI.

Organizations implementing network virtualization technologies require a gateway between their virtualized networks and traditional IPv4/IPv6 networks. F5 has developed a plug-in for Microsoft System Center Virtual Machine Manager (SCVMM) that allows the BIG-IP® system to act as a high-speed, service provider–class gateway while providing a robust suite of application services in an HNV environment.

Network Virtualization with Microsoft HNV

Many organizations are considering virtualizing their networks to simplify management and enhance performance and scalability.

Service providers and enterprises are constantly onboarding new tenant applications and workloads from different entities that could have conflicting or overlapping IP addresses. By decoupling the virtual networks from the physical network infrastructure—and removing the constraints of hierarchical IP address assignment from virtual machine provisioning—these organizations eliminate the labor of finding new and unused IP space or reallocating IP addresses.

Large enterprises and government agencies manage hundreds of distinct child networks across their organizations. Bringing these networks together in a traditional data center could cause IP address conflict and confusion, a problem that is removed in an HNV environment. In the case of acquisitions, an enterprise running a virtualized network can quickly and seamlessly onboard a whole new network and suite of applications belonging to the acquired company.

And unlike traditional VLANs, which can be difficult and labor-intensive to provision, deploy, and manage, HNV uses SCVMM to seamlessly automate the deployment of virtual machines throughout the virtual network.

Bridging the Virtual and Physical Networks

Organizations that want to virtualize their networks with HNV need a gateway between the virtual and physical networks. While the built-in Windows Server offers basic gateway functionality, it is limited in its ability to scale and it cannot offer the application services that service providers and enterprises require. In a highly efficient, scalable HNV environment, a gateway is just the beginning.

More than a Gateway

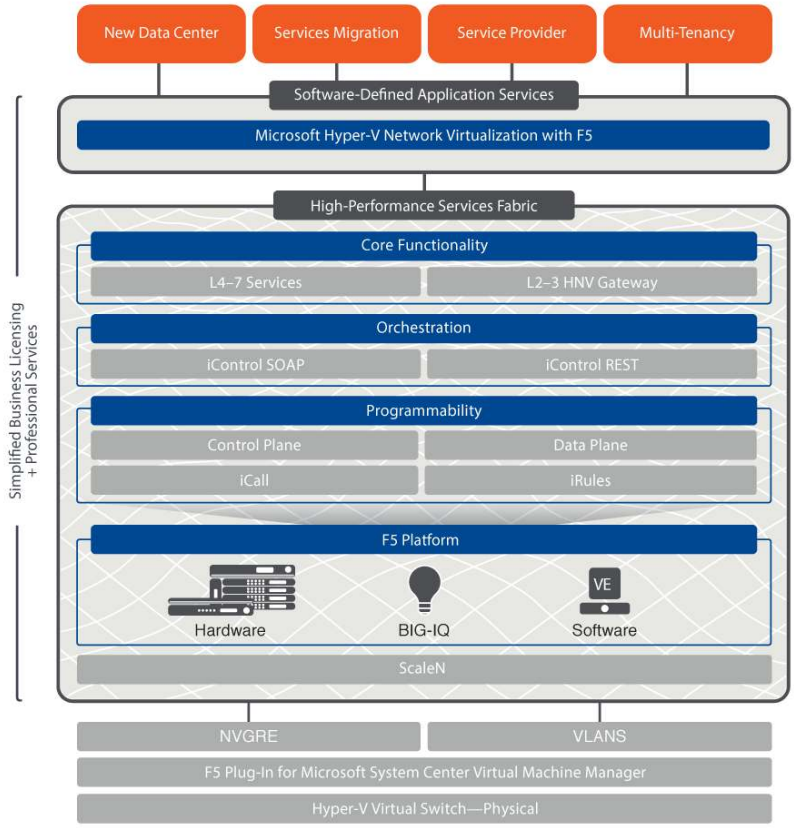
F5 has partnered with Microsoft to develop a high-speed, service provider–class, NVGRE gateway that allows the virtualized networks to communicate with customers' non-virtualized networks, Wi-Fi, and the Internet. In addition, an F5 plug-in allows SCVMM to instruct the BIG-IP system about network policy changes, which means that your organization can maintain a robust security posture, increase efficiency by managing network resources, and prepare for growth with seamless scalability.

An Agile, Secure, and Scalable Solution

As the command center and brains of the virtual network, SCVMM maintains a map of all the virtual machines and where they reside on the network. In the F5 and Microsoft HNV solution, SCVMM distributes this map and pushes out HNV policy to the BIG-IP system. Thus, you'll get the HNV gateway you want, along with powerful application services that can keep your virtualized networks running efficiently, allowing your organization to securely deliver applications to customers.

In a virtual network, visibility is key. Traditional devices such as web application firewalls and intrusion prevention systems that don't have visibility into the encapsulated packets are blind to the traffic—and become effectively useless in a virtualized environment. The powerful encapsulation/decapsulation engine built into the F5 solution allows the BIG-IP system to see inside the encapsulated packets and then apply granular security policies, perform global and local load balancing, accelerate applications, and more.

When evaluating a new architecture for the data center, maintaining consistency in services, network performance, and management is paramount. By deploying HNV with the BIG-IP system, you can ensure a consistent transition, while realizing additional benefits in provisioning, management, and scalability.



The F5 and Microsoft HNV solution allows the BIG-IP system to act as an NVGRE gateway while delivering application services.

Your organization can reap the many benefits of network virtualization through the F5 and Microsoft HNV solution:

- Simplify management by deploying and moving virtual machines without changing their IP addresses

- Onboard new tenant workloads and applications quickly and efficiently
- Improve network resource utilization with flexible placement of virtual machines
- Easily move workloads from data centers with minimal reconfiguration of infrastructure and policies
- Perform maintenance and upgrades without downtime of customer workloads
- Enhance the flexibility and scalability of network infrastructure
- Maintain required multi-tenant isolation and granular security policies

Conclusion

Network virtualization with Microsoft HNV offers many benefits to service providers and enterprises that need to manage disparate networks, workloads, and applications. The F5 and Microsoft HNV solution employs a plug-in that allows SCVMM to communicate directly with the BIG-IP system, thus providing the high-speed, scalable HNV gateway you need, while reducing the operational overhead of managing point solutions individually.

This communication between SCVMM and the BIG-IP system also makes it possible to deploy a host of traditional application services—including security policies, application acceleration, and load balancing—on the virtualized networks. By deploying the F5 and Microsoft HNV solution, you can realize improvements in provisioning, managing, and scaling your virtual networks—all while providing the application services that your customers want.

F5 Networks, Inc.
401 Elliott Avenue West, Seattle, WA 98119
888-882-4447 www.f5.com

Americas
info@f5.com

Asia-Pacific
apacinfo@f5.com

Europe/Middle-East/Africa
emeainfo@f5.com

Japan
f5j-info@f5.com