Solution Requirements

1. Create Network Services On-demand in multi-layer data center network

2. Orchestrate L2-L7 service chain with "Best-of-Breed" vendor devices in every layer

3. Service-chain must leverage both physical and virtual devices

4. Network services must provide the option to dynamically modify network functions and properties

Solution

- Anuta Networks comprehensive orchestration solution provides complete network services life cycle management for L2-L7 service chain and delivers them on-demand

Benefits

1. Customers can offer Network-As-A-Service to generate new revenue stream and to drastically reduce CapEx and OpEx

2. Use "Best of Breed" vendor devices like F5 ADCs to support their business needs

3. Protects customers' investments as the solution leverages both physical and virtual devices for delivering network services

4. Dramatically increases productivity as the network services can be modified

Accelerate Application Delivery with F5 and Anuta Networks

Introduction

Anuta Networks' NCX is a proven industry leading solution designed for large service providers and enterprises looking to deploy cloud services. It virtualizes existing multi-vendor network infrastructures, and integrates with variety of cloud portals such as vCloud Director, OpenStack etc to allow customers to do dynamic self-service network provisioning.

Extending this capability beyond traditional layer 2-3 services, Anuta has partnered with F5 to simplify and deliver the advanced network services from layer 4-7 leveraging both physical and virtual devices. Utilizing the F5's iControl API, Anuta has simplified deployment of F5 network and application services.

Customer Requirements

1. **Create Network Services On-demand in multi-layer Data Center Network:** Both Enterprise and Service Provider data centers are designed in multi-layer manner starting with WAN Edge, Core, Distribution, Services, Access, and Virtual Access. Creation of service chain manually across multiple layers of devices introduces significant delay, inefficiency, and errors. Enterprise IT being a service delivery organization it wants to offer network infrastructure as a service. Similarly, Cloud Service Providers (CSP), to generate new revenue stream, they want to offer Network-As-A-Service (NaaS) just like compute and storage services are offered.

2. **Support Best-of-Breed Vendor Devices:** Customers preferred choice is to use "best-of-breed" devices in their business critical network infrastructure. For example, when it comes down to Application Delivery Controller (ADC) many enterprises and Cloud Services Providers have chosen F5 Networks products such as BIG-IP or VIPRION devices. Although the best-of-breed solution strategy is certainly the right approach it does pose a challenge for the IT networking team in terms of developing expertise across different vendors and technologies in multi-layered network infrastructure.

3. **Support Multiple Form Factors:** Customers have been enjoying the benefits of Server and Storage virtualization for the past few years. To reap the benefits of network virtualization they are moving towards virtual appliances such as F5's virtual ADC (LTM-VE). At the same time, they want to continue to leverage the physical network infrastructure as they have already invested millions of dollars. Leveraging both physical and virtual appliances require significant virtualization expertise and does bring additional deployment complexities in an already complex network environment. Hence, they are looking for an orchestration solution that has the ability to deliver end-to-end service-chaining tying both physical and virtual devices.

4. **Modify Network Services Dynamically:** After delivering a network service to customers, the current manual method is extremely time consuming and inefficient to make any changes to existing network services. So, the new network services orchestration solution must provide the facility where the users (/customers) of network service infrastructure be able to make changes by themselves.

The Combined Solution

Anuta Networks had partnered with F5 Networks to simplify the complete network services delivery, to satisfy the above listed customer requirements, and beyond. The joint solution supports all flavors of F5's ADC products to deliver network services. Based on the business need such as compliance, security, and performance customers may choose to deploy a multi-tenant ADC using virtual contexts, route-domains, or LTM-VE on VIPRION or BIG-IP appliance.

Figure-1: Anuta's NCX Network Service Solution Delivery process

Discover Network Devices → Construct Network Topology → Design Network Services → Orchestrate Network Services → Manage Network Services

Accelerating Application Delivery Deployment

Automatic Discovery and Construction of Network Topology: As soon as NCX is deployed in the network, it starts to discover the network devices using protocols such as CDP, LLDP, and SNMP. As part of the discovery process it also models and abstracts the underlying network devices. At the end of discovery process it automatically draws the physical network topology diagram.

Design, Deliver, and Update Network Services on-demand: NCX enables the network architect to design object oriented services with Service Designer. Exposing different network functions into the Service Designer allows customers to continue to adopt best of breed technologies in various portions of their network while greatly reducing the administrative burden through complete automation and orchestration across the multi-layer network.

Upon tenants' request for a new network service, Anuta NCX orchestrates the heterogeneous setup which can automate hundreds of steps previously performed manually. Finally, Anuta NCX monitors the performance, health, and availability of the service end-to-end across the disparate physical devices and maps any problems back to the logical services and tenants that are impacted.

Anuta's Dynamic Network Services solution allows the end customer to make changes to their network service on-demand. For example if end customer adds a new server to an existing server farm any changes that are needed on ADC can be done by themselves using the easy to use home-grown portal or via NCX portal.

The solution allows two identical network services to use two different methods of deployment. For example, using the Service Designer the network service can be designed such that one service may use LTM-VE and the other network service could be orchestrated using route-domain on BIG-IP or virtual contexts on VIPRION.

Figure-2: NCX's Network Service Design using virtual appliance for ADC
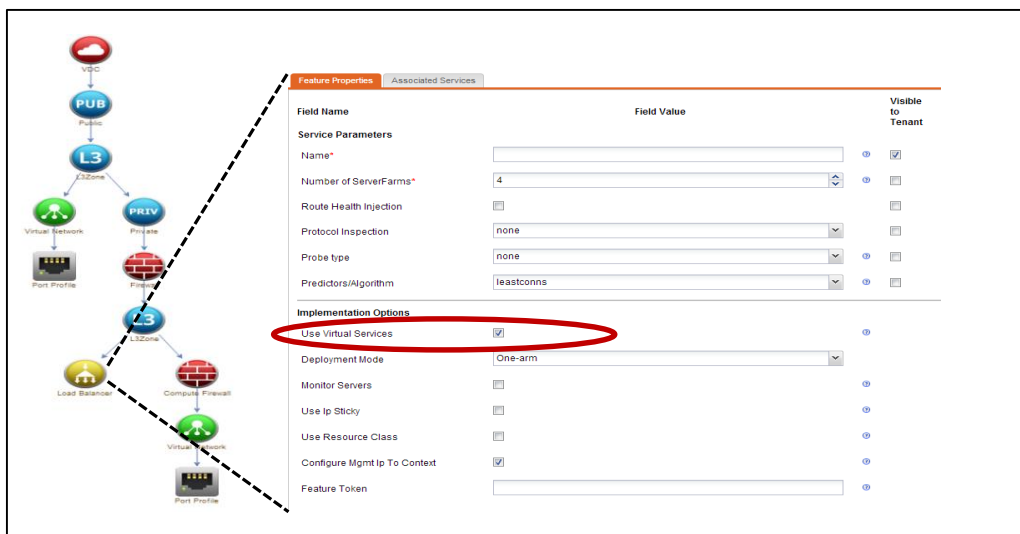
The below diagram depicts the L2-L7 service chain created by NCX that uses all virtual network devices. For Application Delivery the solution is using F5's LTM-VE.

Figure-3: NCX's orchestrated end-to-end (L2-L7) service chain using F5 LTM-VE
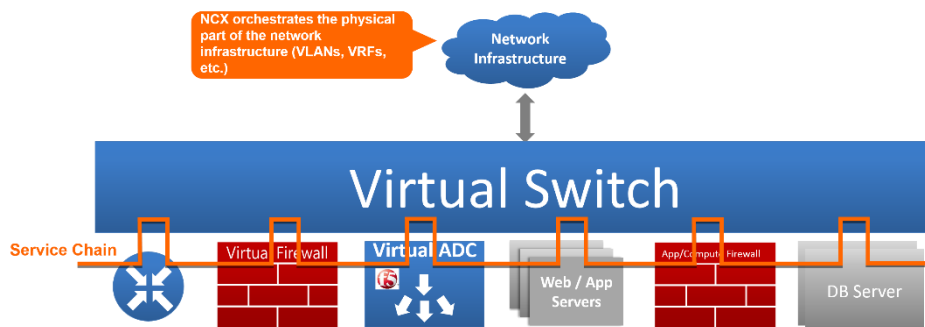
The figure-4 depicts the L2-L7 service chain created by NCX where all the network devices are physical. For Application Delivery the solution uses F5's BIG-IP appliance.

The Figure-5 depicts the L2-L7 service chain created by NCX in a hybrid network environment where some devices are physical and others are virtual. In this example diagram, the ADC is F5's LTM-VE.

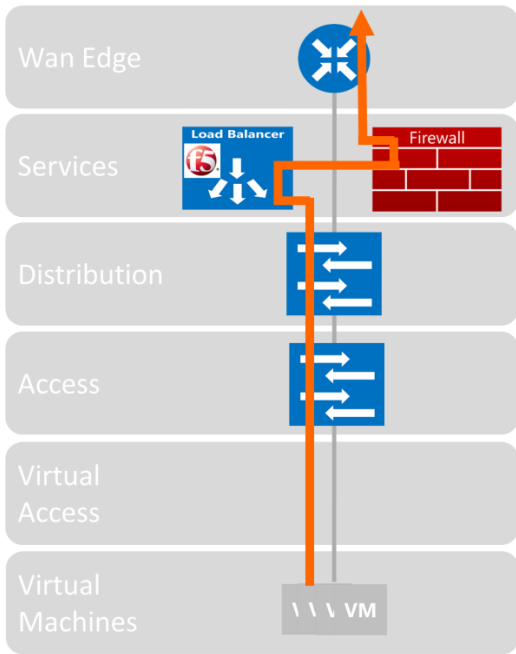**Figure-4: NCX orchestrated L2-L7 service chain using F5 BIG-IP in All physical topology**
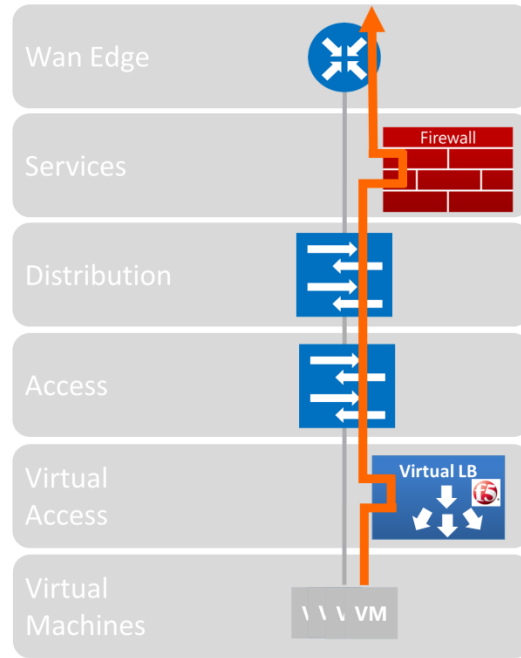

Figure-5: NCX orchestrated L2-L7 service chain using F5 LTM-VE in Hybrid topology

Summary: Anuta's NCX integration with F5 truly enables customers to provision multi-tenant network services on-demand, using best-of-breed vendor devices in a multi-tiered data center network while fully protecting their investments. Combined with dynamic network services capability, the on-demand network services dramatically increases productivity and drastically reduces both CapEx and OpEx.

About F5 Networks

As the global leader in Application Delivery Networking, F5 makes the connected world run better. In fact, you've probably relied on F5 products dozens of times today and didn't even know it. F5 helps organizations meet the demands that come with the relentless growth of voice, data, and video traffic, mobile workers, and applications—in the data center and the cloud.

About Anuta Networks

Anuta Networks, Inc. is the industry-first provider of end-to-end network services virtualization solutions for all cloud deployments. The Company's cloud service delivery solutions help organizations of all sizes accelerate the transition to cloud computing for improved business agility. Anuta Networks' partnerships with industry leaders such as Cisco Systems, VMware and many others further enable customers and service providers to rapidly transform their network services in agile cloud deployments. Anuta Networks was founded in 2010 by industry veterans with deep expertise in data center, virtualization, and network and enterprise systems management. The Company is headquartered in Milpitas, California, and with R&D operations in Bangalore, India.

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