Use Case Brief

BORDERLESS DATACENTERS

Today's cloud service providers must maintain consistent levels of service for each end user or customer, independent of physical location and hardware. This brief describes how Nuage Networks delivers unified and consistent networking across and among disparate datacenter configurations.
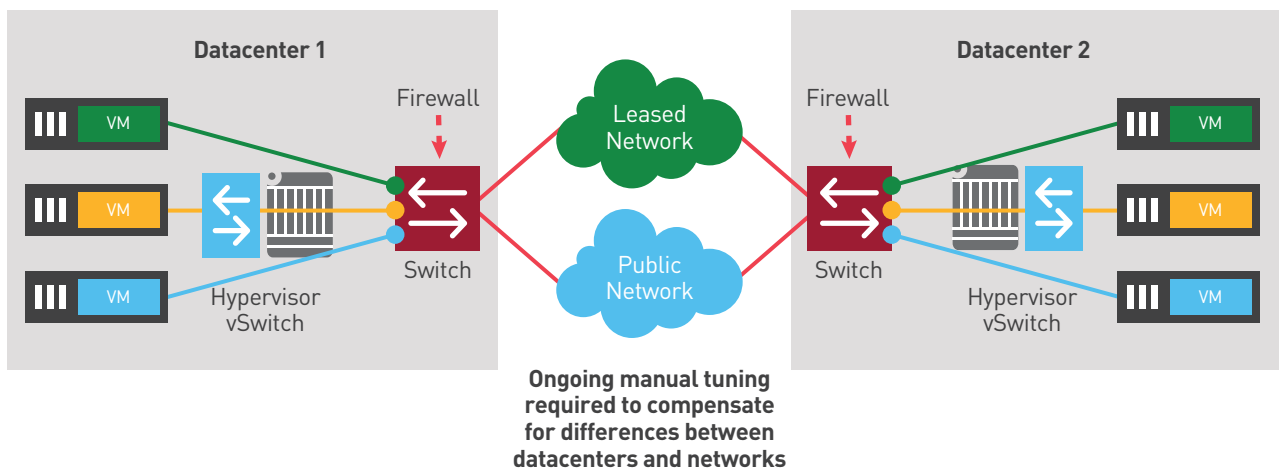
nuagenetworks
From Nokia

Challenges

Service providers can often standardize services within a single datacenter. However, multi-datacenter IT environments challenge legacy networking:

- **Disparate environments:** Service providers typically have multiple datacenters that must be managed efficiently and consistently despite having different build-outs and, often, origins in different companies with varying standards and practices.

- **Poor mobility:** Virtual machines (VMs) and applications are not readily portable among datacenters.

- **Manual tuning:** To deliver consistent networking services across datacenters, a great deal of manual tuning is typically needed on an ongoing basis.

These challenges are depicted in Figure 1.

FIGURE 1. Datacenter and network silos

Ongoing manual tuning required to compensate for differences between datacenters and networks

Setup: 6 initial definitions of policies and connections ● ● ● ●
Tuning: Manual and Ongoing
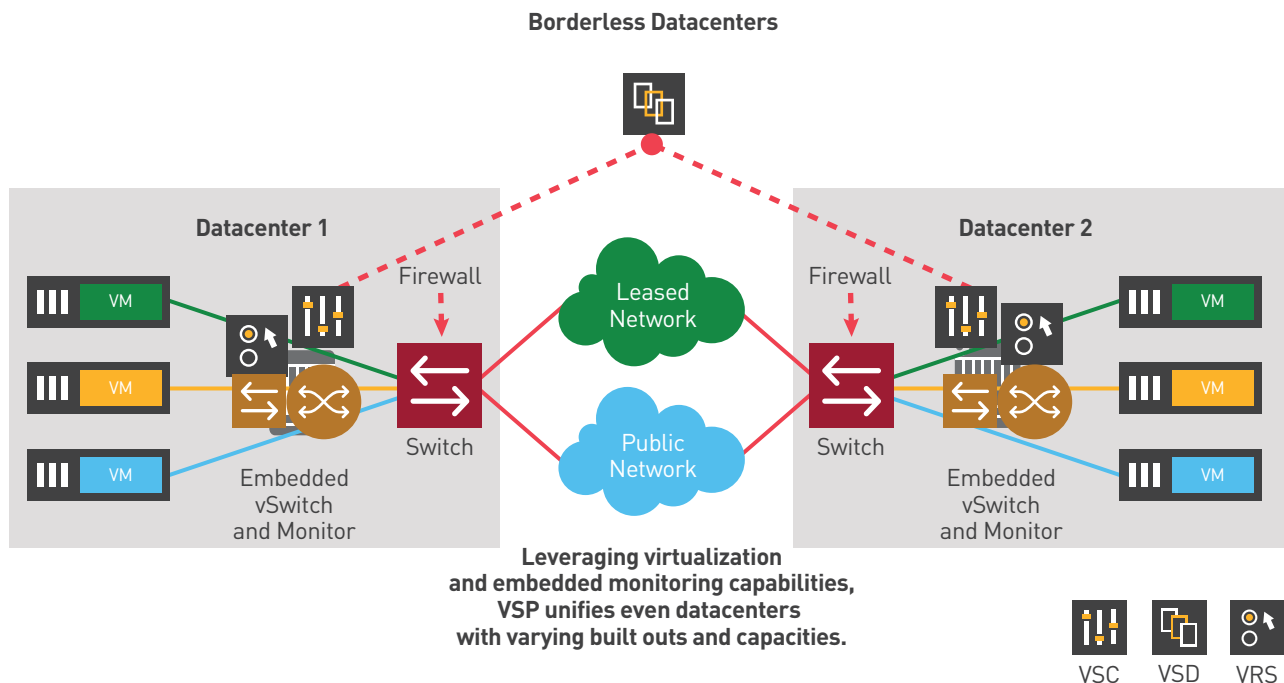**Inter-datacenter:** 4 changes/VM motion plus Policies plus Tuning

How We Help You

Nuage Networks Virtualized Services Platform (VSP) has been architected to be a non-disruptive overlay for all existing virtualized and non-virtualized network resources. No purpose-built networking hardware is required since all components are virtualized. In a way that is similar to how cell phones preserve their attributes while in roam mode, Nuage Networks VSP preserves the network attributes (required network settings including security) no matter where the workload is placed. By replacing the tie to the physical network element with a set of required network attributes, Nuage Networks VSP provides full network roaming capabilities for your workloads.

Network virtualization removes physical hardware complexity to level-set networking within and across datacenters. Centrally defined policies control overall resource allocation, security and other specifications even on varying hardware and software configurations.

As shown in Figure 2, the Virtual Services Directory (VSD) manages network provisioning and security policies and communicates with one-to-many Virtual Services Controllers (VSCs) via the control plane (as indicated by the dotted lines). Each VSC provides control plane coordination among one-to-many Virtual Routing and Switching (VRS) components. Each policy is interpreted by the VRS data plane component to automate network provisioning for VMs and applications. Since the VRS includes both an embedded virtual switch (vSwitch) and a firewall, datacenter mobility and security capabilities are maximized.

FIGURE 2. Removing network boundaries within and among datacenters

Borderless Datacenters

Leveraging virtualization and embedded monitoring capabilities, VSP unifies even datacenters with varying built outs and capacities.

Setup: 1 initial definition of policies and connections ●
Tuning: Automatic and automated
Inter-datacenter: 0 initial + 0 changes/VM motion

Nuage Networks facilitates workload mobility as VMs move with all metadata (network and security settings) needed to operate. Leveraging a single master policy, VMs can be moved either within the datacenter or across datacenters in a completely automated fashion. No network or security provisions need to be redefined. Nuage Networks VSP ensures the VM's metadata are preserved and moved with the application or VM. Then, when the application or VM boots, Nuage Networks VSP is triggered and takes the appropriate action(s). Via Nuage Networks VSP's Service Chaining automation capabilities, multi-step authorizations (such as enabling cascading security checks down multiple firewalls) can be performed.

Embedded monitoring capabilities provide real-time performance data. Flexible policies utilize the VM's metadata and the performance data to calculate the right level of network resource needed for the VM in its new location. By unifying the entire network environment into a coherent, manageable whole, Nuage Networks truly creates borderless datacenters.

How this Approach Changes the Game

This innovative approach provides game-changing functionality for borderless datacenters. A few capabilities are highlighted below.

- **Complete UI-driven Self-service:** End users can literally control every aspect of their virtualized environment via their choice of user interface (such as a CMS interface, Nuage Networks VSP, or an in-house interface). This capability both increases customer control and enables datacenters to handle staggering volumes of customers, virtual machines, and request volumes.

- **Fully Automated Elasticity:** With complete end-to-end automation, VMs can be provisioned within seconds and new hardware can be added to the cloud within minutes.

- **High Security within the Datacenter:** Legacy security approaches focus on external threats rather than threats within the datacenter. Nuage Networks VSP's built-in security, including a default "Zero Trust" model, operates at the VM and virtual network levels. By protecting the datacenter at the first connection point to the network for VMs and applications, full security and isolation is provided within the rack, within each customer's operations, and within the datacenter.

- **Full Multi-tenant Isolation:** By removing the constraints imposed by legacy and hypervisor-based networking, Nuage Networks VSP enables full network isolation by tenant (customer/customer department). As a result, resource demands made by one tenant do not impact others. Further, Distributed Denial of Service (DDoS) attacks against one tenant do not compromise the performance of other tenants.

- **Scale-out Resource Model:** Nuage Networks scales out via federated controllers to present a unified network fabric to any size cloud. A unified fabric enables a number of private clouds capabilities including consistent network service independent of underlying hardware, full workload portability among datacenters, and full programmability for future services.

- **Predictable Cloud SLAs:** Leveraging Nuage Networks VSP's capabilities, public clouds are able to provide predictable Service Level Agreements (SLAs). Nuage Networks VSP virtualizes the network to provide consistent, committed performance that is independent of the underlying server and network hardware. Further, SLAs can be defined for different levels of service.

- **Full support across CMS systems and Hypervisors at Scale:** Nuage Networks VSP's support across CMS stacks and across hypervisors at scale is the foundation for a large-scale private cloud. These capabilities not only reduce infrastructure complexity but also provide the feature set necessary for efficient consolidation across the enterprise.

Benefits

- **Consistent network resources:** Nuage Networks provides consistent network resources and security even for disparate datacenter configurations.

- **Unified management:** With full management support across Cloud Management Software stacks, hypervisors, hardware and more, the entire environment can be managed effectively and efficiently.

- **Fast absorption:** A newly acquired or consolidated datacenter can be quickly integrated into the unified network without requiring upgrades.

Why Our SDN is Unmatched for Borderless Datacenter Networking

Nuage Networks is the best software defined networking choice for Borderless Datacenters. Our products include network unification and consistency capabilities that cannot be matched by any other vendor.

Level-sets networking even on disparate hardware

Our SDN products use a unique policy-based approach to provide consistent network resources independent of the underlying hardware configurations.

Enables you to efficiently balance workloads

Our policy framework ensures automated, secure and reliable balancing and mobility of datacenter workloads.

Relies on security that is consistent and provable

Since datacenter security is policy-based, when VMs move they retain the same security settings. All security parameters are logged for auditing.

nuagenetworks
From Nokia