Automatisation d’un Cloud Hybride avec Nuage Networks

dom.schaeffer@nuagenetworks.net
Senior Consulting Engineer
Our Mission

Make Networking as instantaneous and readily consumable as compute

- **Open**: Preserve choice, new Services
- **Boundary-less**: Networks, not islands
- **Policy-Driven**: Automation, Security & Visibility
Business drivers

- **CaPex**: Leverage Economies of Scale with x86 & Virtualization Technologies
- **OpEx**: Enable Automation & Templating
- **TTM**: Accelerate Your Business with Datacenter SDN & Branch Office Software Defined WAN (SDWAN)

**Business drivers**

- **DC-SDN**
- **SD-WAN**

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Nuage Networks: SDN solutions

VCS (Virtualized Cloud Services)

VNS (Virtualized Network Services)

Nuage Networks Virtualized Services Platform (VSP)

Virtualized Services Directory (VSD)
- Network Policy Engine – abstracts complexity
- Service templates and analytics

Virtualized Services Controller (VSC)
- SDN Controller, programs the network
- Rich routing feature set

DC-SDN (Datacenter SDN) Feature Set
Virtual Routing & Switching (VRS)
- Distributed switch/router – L2-4 rules
- Supports leading hypervisors and base metal assets
- Virtual (VRS) and Physical (VSG) form-factors

SD-WAN Feature Set
Network Services Gateway (NSG)
- Physical or Virtual SD-WAN Edge for Branches
- L2-L4 Switch/Routing with Advanced Functions
Nuage Virtualized Cloud Services


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Nuage Networks: SDN Features

**NETWORKING**
- L2 VPN & L3 VPN
- VM & CONTAINER SUPPORT
- QoS & NAT/PAT & DHCP

**AUTOMATION**
- POLICY-DRIVEN NETWORKING
- DYNAMIC PROGRAMMABILITY
- CENTRALIZED TEMPLATING

**CONTROL**
- CENTRALIZED POLICY
- SDN TRAFFIC STEERING
- SDN SERVICE CHAINING

**SECURITY**
- GRANULAR STATEFUL FIREWALL
- ANALYTICS
- LOGS & AUDITS
Policy-Driven Virtualized Networking across any environment
Same policies used across any endpoint
Secure Hybrid Cloud Interconnect

Using Nuage Networks NSG solution (Full mesh to other sites)

- Enables
  - Secure mesh of connectivity between sites
  - Full intra and inter-Region VPC peering
  - Dynamic exchange of routing info between sites
  - Visibility and control of traffic flows between sites
**Nuage Architecture Components involved**

**How does it work?**

- **VSD** for overall end-to-end service management and provisioning
- **In the DC**
  - **VRS** – Manages forwarding and security between hypervisors and gateway (VXLAN based)
  - **VSC** – Programs connectivity between VMs
  - **NSG-BR** – Border Router demarcating private DC and public (Secure) connection: it translates VXLAN -> IPSeC and links public to private domains
  - **VRS** – Performs local L2-L4 functions for tenant networks, and sets up VXLAN tunnel
- **In Public Cloud**
  - **NSG-AMI** – Acts as default gateway within the VPC and initiates the IPSeC tunnel to the DC or to other VPCs
  - **VSC** – Programs connectivity between NSGs
The Role of Border Router

- **Role of Border Router**
  - Is part of encrypted mesh between NSGs
  - Cross-connects private and public networks
  - Provides application control and visibility that are used between the DC and public cloud

![Diagram showing the role of a border router](image)
Internals of the NSG-AMI

- **Nuage-Interworking**
  - VSC programs NSG with
    - Prefixes from other sites
    - Encryption group-keys
    - Traffic/Application Policies
  - NSG reports back statistics and application information

- **VPC-Interworking**
  - NSG attracts all outgoing traffic
  - NSG polices and encrypts traffic before sending to public (other NSG)

![Diagram showing NSG-AMI internals]

Public

VSC

R

Default route-table: 0/0 Next-hop NSG-LAN-IF
Secure Hybrid Cloud Interconnect

Application Insight example

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<th>filters</th>
<th>Domain</th>
<th>APMGroup</th>
<th>Application</th>
<th>L7Classification</th>
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</table>
Secure Hybrid Cloud Interconnect

VSD Domain Topology example
Hybrid Cloud Management

Using VSD as unified policy layer for private and public cloud

- Enables
  - Single pane of glass for networking design
  - Single pane of glass for security definition
  - Full auditing capabilities between actual and intent

* Planned for future
Hybrid Cloud Management

VPC and Subnet Design

- VSD acts as Front-end to VPC Design
  - Discovery phase
  - Sync Phase
- Manages
  - VPC design
  - Subnet design
  - ACL design
Hybrid Cloud Management

ACL-Design

Ingress Security Policies

- VPC Ireland-VPC1 (vpc-7e53311... vpc-7e53311a)
  - Allow IP Traffic by Default
  - Allow non IP Traffic by Default
  - Allow Address Spoofing

- VPC Ireland-VPC2 (vpc-f89be1e... vpc-f89be1e9)
  - Allow IP Traffic by Default
  - Allow non IP Traffic by Default
  - Allow Address Spoofing

- N-ACL acl-42722025 for VPC Ireland... acl-42722025
  - Allow IP Traffic by Default
  - Allow non IP Traffic by Default
  - Allow Address Spoofing

- N-ACL acl-300655c4 for VPC Ireland... acl-300655c4
  - Allow IP Traffic by Default
  - Allow non IP Traffic by Default
  - Allow Address Spoofing

Security Policy Entries

- VPC vpc-168ccae69 SG sg-ebb1-dbe4 to CIDR 0.0.0.0/0 Ingress rule for protocol 0, destination
  - BlueType IP/4 - 0.0.0.0/32, Protocol Any, DSCP Any
  - vpc2-default-sg

- VPC vpc-168ccae69 SG sg-e9f74de to CIDR 0.0.0.0/0 Ingress rule for protocol 0, destination
  - BlueType IP/4 - 0.0.0.0/32, Protocol Any, DSCP Any
  - vpc2-nwmgmt-sg

Layer 3 Domains

- L3 DOMAIN TEMPLATES
  - AWS-Enterprise-region-template
    - No description given

- MY L3 DOMAINS
  - eu-southeast-1
    - No description given
  - eu-central-1
    - No description given
  - eu-west-1
    - No description given
  - us-west-1
    - No description given

L3 DOMAINS SHARED WITH ME
Market success

- 60+ wins & deployments
- 150+ trials/pilots successfully completed
- Across hyper-scale enterprises, cloud providers & service providers
- Major wins across all regions, to name a few: BBVA, SFR (Numergy), Santander, Betfair, Bloomberg, UPMC, CTCC, MyRepublic, Telus
A strong partner Ecosystem

Industry Solution Partner of the Year - 2015
Honoring a Red Hat partner who has significantly impacted the industry with Red Hat solutions.

Red Hat Honors 2015 North American Partner Award Winners
Award recipients recognized for delivering innovative open source solutions
Conclusion

- **Integrated & certified** joined solutions with Red Hat

- **Enabling** Private/Public/Hybrid clouds:
  - Augmented Security within the Datacenter
  - Seamless Mobility of workloads
  - Increase Network performances

- Reduce OPEX, Faster deployment & optimized CAPEX
Thanks!
See you at the Nuage booth next week in Barcelona!
Thanks !