VXLAN Bridges Virtual and Physical Networks to the Cloud

Inside

VXLAN

A new network technology developed by Arista and VMware that enables stateful VM mobility, within the data center beyond L3 boundaries. This increases the agility of applications and enables workloads to be deployed to better meet the business needs.

Why?

By overcoming the need of flat, layer 2 networks, customers are able to take advantage of more scalable, proven layer 3 technologies within their Data Center without sacrificing crucial application mobility. Arista's support and implementation of VXLAN promises greater scale, service integrations, accounting visibility and demand management without restricting device interoperability or workload mobility.

Who Cares?

Virtualization and Network administrators who want to increase the scalability or mobility of their virtual architectures between data centers and/or between routed domains while retaining full workload portability.

Arista and VMware have co-authored a new standard in cloud networking: the Virtual eXtensible LAN (VXLAN). VXLAN is a tunneling mechanism that runs between virtual or physical switches and enables applications to be deployed and moved between any server within the Data Center regardless of IP subnet or physical host location. This enables IT departments to dynamically scale network architectures to support capacity on demand and workload mobility regardless of geography and existing IP addressing. VXLAN also overcomes scalability and segmentation limitations which exist within today's data center protocols such as TRILL, Spanning Tree, and others. Unlike other network virtualization overlay models, VXLAN uses proven IP protocols and requires no change to the underlying IP architecture or existing data center infrastructure.

What is VXLAN?

VXLAN is a network encapsulation and segmentation protocol enabling applications to be deployed on any server, on any network, at any time. It accomplishes this by encapsulating the application's MAC and IP packets within a UDP header and utilizing IP multicast groups to emulate broadcast domains. VXLAN encapsulation and decapsulation is done at the Virtual Tunnel End Point (VTEP) located at the virtual or physical edge of the network. Because VXLAN networks are not bound by IP subnets or L2 boundaries, VXLAN can utilize the existing L3 network topology. Large Layer 2 broadcast and failuredomains can be eliminated and traded for more stable L3 networks supporting greater scale, better multi-pathing and milli-second convergence. In addition, previous scalability limitations due to MAC address table exhaustion and limited VLAN tags are replaced with the VXLAN header allowing for up to 16 million customer segments.

## What is Arista doing to enhance VXLAN?

A major benefit of VXLAN is that it seamlessly integrates on top existing IP networks without the hassle of major upgrades or infrastructure replacement. From a physical network perspective, VXLAN requires both IP routing and IP multicast to be deployed. Arista's EOS supports robust Layer 3 protocols and PIM support across the entire networking portfolio. With many Arista switches supporting in excess of 40,000 IGMP groups, VXLAN scale is far greater than current VLAN tags for larger scale and multi-tenant data centers.

Arista is also supporting VXLAN gateway functionality by offering VXLAN encapsulation and decapsulation capabilities in hardware. This support for hardware VTEP, or virtual tunnel end point, capabilities will extend the reach of VXLAN enabled networks to non-virtualized hardware and appliances and allow for interoperability between the VXLAN and non-VXLAN world without re- designing network infrastructure or restructuring applications.

VMtracer for VXLAN - Critical Physical, Virtual and Cloud Visibilisty

VMTracer provides visibility, real time accounting and network automation through Arista's Extensible Operating System (EOS). These functionality's are vital when managing and troubleshooting VXLAN tunneled networks. In real-time Data Center production environments, VMs are being deployed dynamically, vMotion and VM-FT are used as an integral part of change control and IT business continuity is expected. The addition of VXLAN visibility to Arista's VMtracer product suite gives networking and server admins the necessary tools for management, audit and troubleshooting of these dynamic cloud Data Centers.

VM Tracer with VXLAN Extensions within the Arista EOS framework is designed to provide the real-time and historical audit capabilities along with virtual network integration that guarantees visibility and troubleshooting are simpler and more effective within the virtual, physical and tunneled cloud environments..
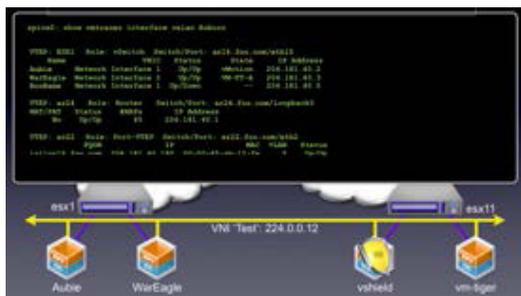
The perennial challenge of any encapsulation technology is troubleshooting and management visibility into traffic patterns for provisioning. Because all packets are UDP encapsulated, most host attributes including MAC and IP addresses are hidden. Since VM's are constantly moving around, this visibility into the hosts identity as well as host location and network attributes is vital for maintaining and operating a virtualized data center. Arista is adding VXLAN support to VM Tracer, Arista's unique offering that directly mounts the vSphere API from each participating switch and enables full VM auto-discovery and auto-provisioning. Arista's VM Tracer with VXLAN will enable the network administrator to know and discover:

- The total list of network segments that have been created

- Which hosts are participating in a given network segment

- Which network segments are active on a given switch

- The relationship between physical addressing and virtual addressing

- Which multicast addresses are being used, in real time, for which segments

- Which virtual machines are generating significant network traffic such as vMotion or VM-FT on each segment

Arista VM Tracer with VXLAN Extensions is designed to work natively with VXLAN system to ensure any VM can be deployed on any server, at any time, and automate the network provisioning the use of open APIs and integration with Arista's EOS.

Summary

The introduction of VXLAN has revolutionized cloud and virtual machine deployments. By removing locality and IP subnetting restrictions, the idea of deploying any application, any where is a reality and can be achieved without forklift upgrades, re-designing the network or altering the application. Arista's support for VXLAN gateway is what makes bridging the physical and virtual worlds possible and enables a truly programmable, automated cloud. By enhancing the VM Tracer feature within Arista EOS gives the necessary visibility into the tunneled network required for management and troubleshooting. VXLAN along with open APIs supported through EOS are the building blocks to cloud and the Arista Software Defined Cloud Networking.

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