EOS CloudVision® OpenStack Integration

Single Point of Integration

Arista's CloudVision platform provides a set of services that simplifies monitoring, management and integration in the OpenStack Cloud. It provides a network services abstraction layer that decouples Openstack from the physical data center infrastructure thereby providing software and hardware version independency. This abstraction also improves controller scaling, using only one touch point to control all Arista switches in the data center.

Open and Programmable Infrastructure

At the Core of this integrated solution is the Arista Extensible Operating System (EOS) providing the industry's most advanced network operating platform. EOS combines a modern-day software architecture, an open foundation for development with an unmodified Linux kernel, and a stateful publish/ subscribe in-memory database model to provide a real-time, programmatic, and automated model for cloud networking.

Automated and Agile

Arista ML2 mechanism driver enables Openstack neutron to automatically provision Arista switches through CloudVision as and when new or existing tenants are created or modified.

Building a private, public or hybrid OpenStack cloud requires virtual and physical network infrastructure that is programmable, agile and resilient. Arista EOS CloudVision® delivers a highly scalable and automated infrastructure for an OpenStack environment. By leveraging Arista's robust and resilient underlay infrastructure and CloudVision platform, customers will be able to drastically speed business services, mitigate operational complexity, and reduce costs. Arista's Openstack ML2 driver and Layer 3 Service plugin offer a fully automated and programmatic Openstack cloud solution along with necessary visibility into virtual and physical infrastructure.

Arista CloudVision and OpenStack Integration

OpenStack is a leading open source solution for both public and private cloud deployments. The OpenStack solution is composed of a number of individual projects to address various components of a cloud. Neutron is an OpenStack project to provide "Network as a Service". By leveraging the programmability of EOS and the open APIs of Neutron, customers can deploy a network infrastructure that is automated and orchestrated through OpenStack APIs or dashboards.

Arista CloudVision has extensive integration with the OpenStack Neutron project, giving customers a powerful network platform on which to run OpenStack deployments. The Arista ML2 driver and Layer 3 service plugin, allows operators to automatically provision tenant networks across the physical infrastructure for the highest performance OpenStack networking environment over VLAN and VXLAN based
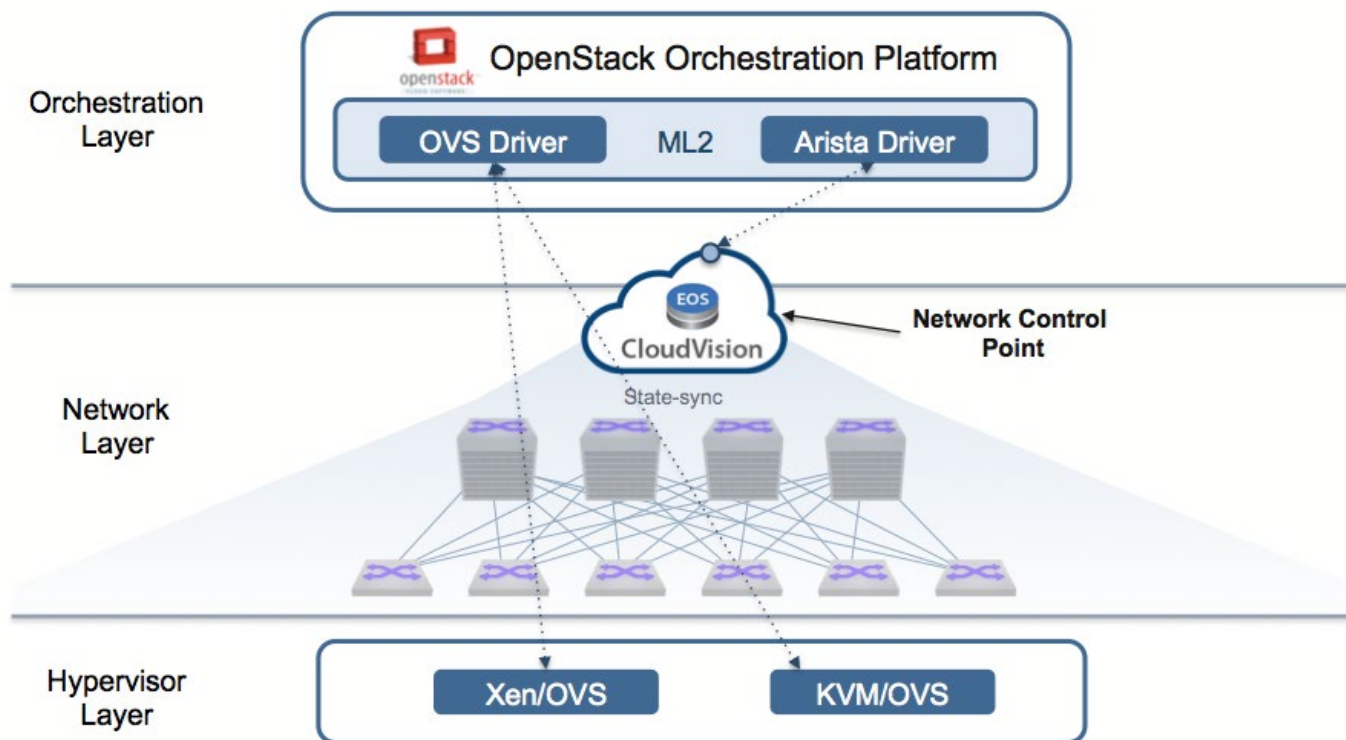
fabrics, while getting enhanced visibility into how the virtual tenant networks map onto the physical infrastructure.

In addition, the Arista CloudVision platform provides network-wide visibility and single point of integration between Neutron and the physical network. Using CloudVision as the integration point allows for details of and changes in the network topology to be abstracted away from OpenStack. If a switch is added to or removed, no configuration change is required on Neutron. CloudVision provides software and hardware version independency for certification. Since CloudVision runs the same EOS as any other Arista switches, customers need to only certify the CloudVision version with OpenStack.

The Arista ML2 mechanism driver enables Neutron to automate VLAN provisioning on Arista switches. As VM instances are created on compute nodes, CloudVision will automatically configure the appropriate Top of Rack (ToR) switch to allow the required VLAN. This works in parallel with the virtual switch driver (such as OVS) that configures the virtual switch on the hypervisor host, and provides tight integration between network and compute provisioning.

With the Arista layer 3 service plugin, customers can choose to use Arista switches as high performance, hardware-based router. The plugin serves as a replacement for the existing Neutron layer 3 service plugin and will create switched virtual interfaces (SVIs) when a virtual router is created in Neutron. Once configured, the hardware switch becomes the default gateway for the virtual machines, and all routing can be done in hardware, instead of at the Neutron network node. In a multi-link aggregation (MLAG) environment, the switches can be configured to use Virtual ARP

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(VARP) for redundancy.

In a layer 3 leaf-spine deployment where layer 2 VLANs need to stretch across racks, VXLAN can provide Layer-2 connectivity over the Layer-3 network. With hardware VTEP support on Arista switches, a VXLAN network can be predefined between the leaf switches. This allows the standard ML2 VLAN driver to configure VLANs on the trunks between the switches and compute nodes, but use VXLAN tunnels between racks. Using this model, VXLAN encapsulation is done at wire speed in hardware on the ToR switch, removing the CPU performance penalty from using software VTEP.

The Arista OpenStack solution provides a number of ways for administrators to orchestrate their switches. The ML2 plugin automates the provisioning of VLANs on Arista switches and can optionally be combined with an Arista VXLAN overlay to provide the functionality across a layer 3 core. With the Arista layer-3 service plugin, a hardware switch can serve as the routing gateway, even in a VXLAN environment where VXLAN routing is required. Providing these capabilities within the OpenStack solution is a significant achievement for integration with physical network devices. Arista has consistently led the way in providing new and open functionality to the OpenStack community, and has an extensive set of features designed to address the needs of scaling an OpenStack cloud.

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