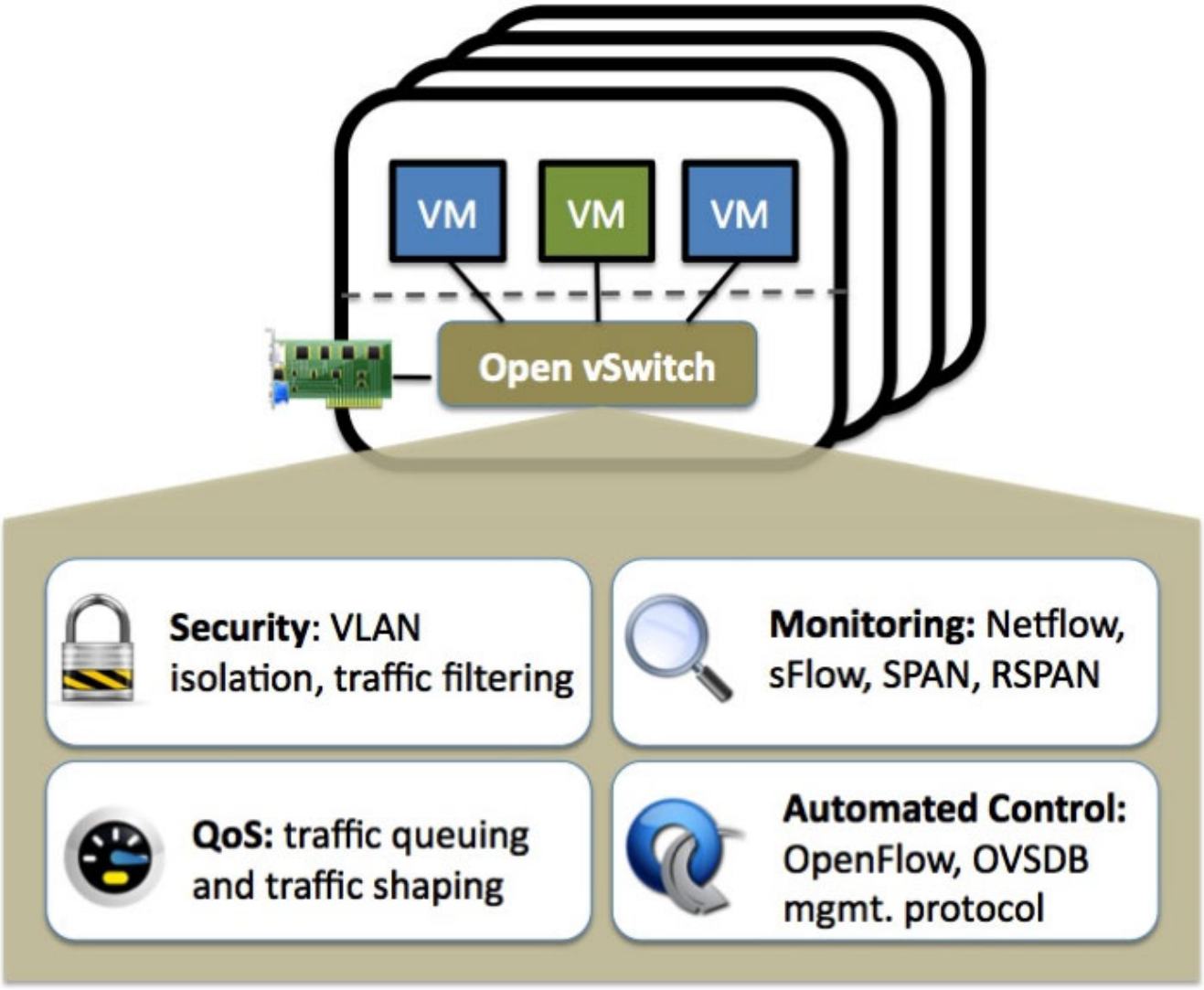
What is Open vSwitch (OVS)?

In order to define what Open vSwitch (OVS) (https://www.sdxcentral.com/projects/open-vswitch/) is, it's extremely important to first understand virtual switching and the new network access layer with in the data center. In the past, servers would physically connect to a hardware-based switch located in the data center. When VMware (https://www.sdxcentral.com/nfv-sdn-companies-directory/vmware/) created server virtualization the access layer changed from having to be connected to a physical switch to being able to connect to a virtual switch. This virtual switch is a software layer that resides in a server that is hosting virtual machines (VMs). VMs, and now also containers, such as Docker (https://www.sdxcentral.com/nfv-sdn-companies-directory/docker-inc/), have logical or virtual Ethernet ports. These logical ports connect to a virtual switch.



(https://www.sdxcentral.com/wp-content/uploads/2014/09/open-vswitch-sdn-virtualization.jpg)

There are three popular virtual switches: VMware virtual switch (https://www.sdxcentral.com/products/vmware-vsphere-distributed-switch/) (standard & distributed), Cisco Nexus 1000V (https://www.sdxcentral.com/products/cisco-nexus-1000v-switches-for-vmware-vsphere/), and Open vSwitch (OVS).

Open vSwitch was created by the team at Nicira, that was later acquired by VMware. OVS was intended to meet the needs of the open source (https://www.sdxcentral.com/flow/sdn-nfv-open-source/) community, since there was no a feature-rich virtual switch offering designed for Linux (https://www.sdxcentral.com/nfv-sdn-companies-directory/linux-foundation/)-based hypervisors, such as KVM (https://www.sdxcentral.com/resources/open-source/what-is-kvm/) and XEN (http://www.xenproject.org/). OVS has quickly become the de facto virtual switch for XEN environments, and it is now playing a large part in other open source projects (https://www.sdxcentral.com/nfv-sdn-open-source-projects-directory/), like OpenStack (https://www.sdxcentral.com/resources/open-source/what-is-openstack-quantum-neutron/).

OVS supports NetFlow, sFlow, port mirroring, VLANs, LACP, etc. From a control and management perspective, Open vSwitch leverages OpenFlow (https://www.sdxcentral.com/resources/sdn/what-is-openflow/) and the Open vSwitch Database (OVSDB) (https://www.sdxcentral.com/resources/open-source/what-is-ovsdb/) management protocol, which means it can operate both as a soft switch running within the hypervisor, and as the control stack for switching silicon. Other important ways OVS is incorporated in software-defined networking (SDN) (https://www.sdxcentral.com/flow/sdn-software-defined-networking/) include:

- OVS is critical to many SDN (https://www.sdxcentral.com/resources/sdn/what-the-definition-of-software-defined-networking-sdn/) deployments in data centers because it ties together all the virtual machines (VMs) within a hypervisor instance on a server
- It is the first entry point for all the VMs sending traffic to the network and is the ingress point into overlay networks running on top of physical networks in the data center
- Using OVS for virtual networking is considered the core element of many datacenter SDN deployments and the main use case is multi-tenant network virtualization (https://www.sdxcentral.com/flow/network-virtualization/?utm_source=pink_ball&utm_medium=link&utm_campaign=links&utm_content=network-virtualization://)
- OVS can also be used to direct traffic between network functions (https://www.sdxcentral.com/flow/nfv-network-functions-virtualization/?utm_source=pink_ball&utm_medium=link&utm_campaign=links&utm_content=nfv-network-functions-virtualization) in service chaining use cases

OVS differs from the commercial offerings from VMware and Cisco (https://www.sdxcentral.com/channel/cisco/). One point worth noting about OVS is that there is not a native SDN Controller (https://www.sdxcentral.com/resources/sdn/sdn-controllers/) or manager, like the Virtual Supervisor Manager (VSM) in the Cisco (https://www.sdxcentral.com/channel/cisco/) 1000V or vCenter in the case of VMware's distributed switch. Open vSwitch is meant to be controlled and managed by third party controllers and managers.

For example, it can be driven by using an OpenStack plug-in (https://www.sdxcentral.com/openstack-neutron-quantum-plug-ins-comprehensive-list/) or directly from an SDN Controller (https://www.sdxcentral.com/resources/sdn/sdn-controllers/sdn-controllers-comprehensive-list/), such as OpenDaylight (https://www.sdxcentral.com/resources/sdn/opendaylight-project/). This doesn't mean an SDN Controller (https://www.sdxcentral.com/resources/sdn/sdn-controllers/open-source-sdn-controllers/) is necessary; it is possible to deploy OVS on all servers in an environment and let them operate with traditional MAC learning functionality.

Additional Open vSwitch Resources:

Why Open vSwitch? (http://git.openvswitch.org/cgi-bin/gitweb.cgi?p=openvswitch;a=blob_plain;f=WHY-OVS;hb=HEAD)

Open vSwitch List of Features (http://openvswitch.org/features/)

What is Network Functions Virtualization (NFV)? (https://www.sdxcentral.com/resources/nfv/whats-network-functions-virtualization-nfv/)

What is Network Virtualization? (https://www.sdxcentral.com/resources/network-virtualization/whats-network-virtualization/)