



Connection Tracking (CT) - Open Virtual Switch (OVS) Offload

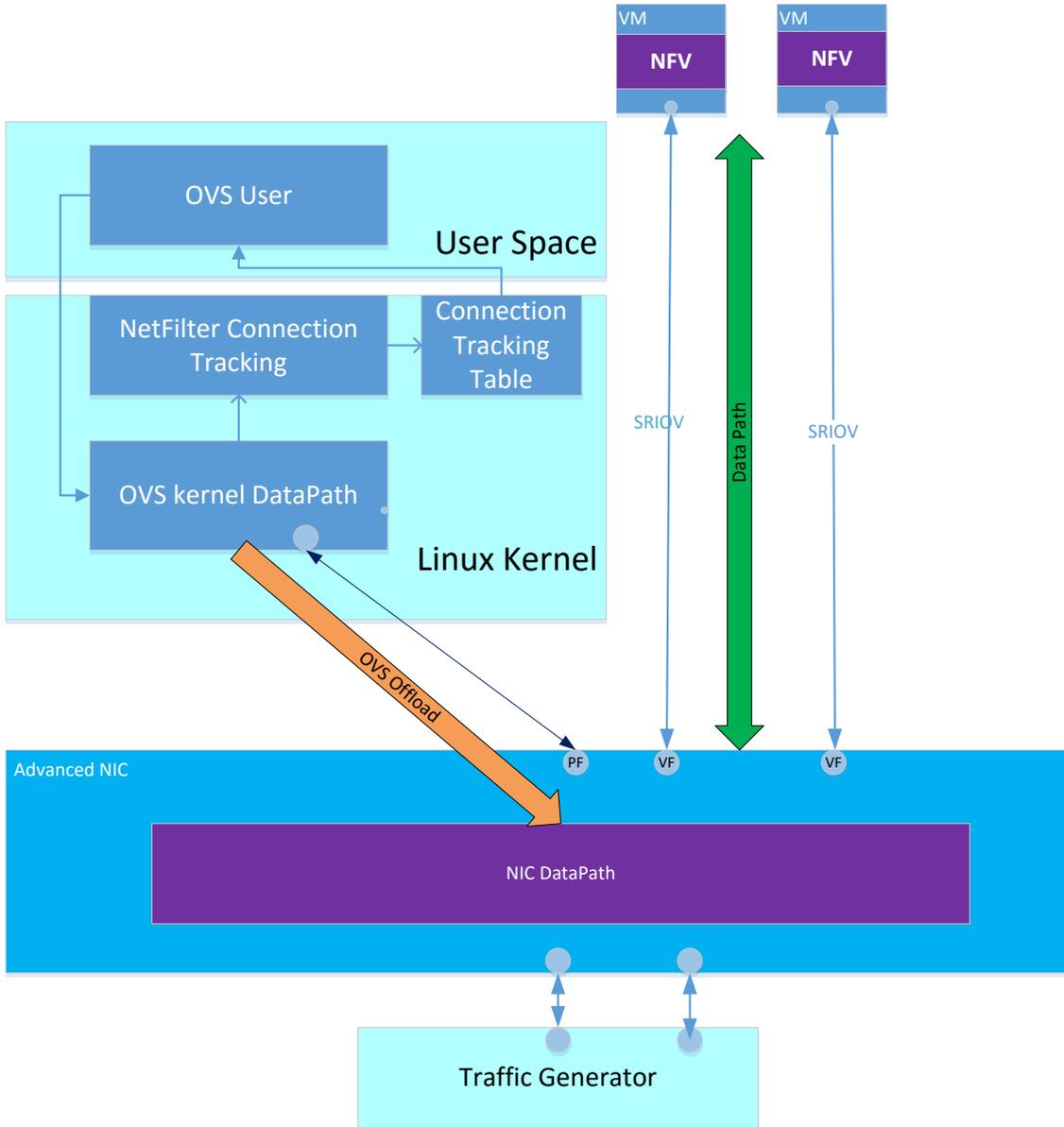
Abstract:

Today's Carrier Ethernet architecture is undergoing the biggest transformation since the beginning of the internet. Video, mobile and cloud usage is driving huge growth in traffic while the constantly changing traffic patterns requires ability to introduce new services quickly. This led the creation of Networking Function Virtualization (NFV), which defines the specifications for Virtualized Network Function (VNF).

VNF is a software implementation of a network function such as routing or firewall. Each such VNF runs in a virtual machine (VM). The VMs are created in a compute blade or in a high scale server – unusually called the host device. The VMs are located on top of the host's Hypervisor that uses Open Virtual Switch (OVS) to switch the data traffic to/from each VM/NFV and also to chain the traffic between them.

OVS is designed to operate under Linux Operating System and uses its kernel services to perform various operational-related functions. One of the frameworks that the kernel provides is NetFilter that offers various operations like packet filtering, Network Address Translation (NAT) and more. One of the important features built on top of the Netfilter framework is Connection Tracking (CT). CT allows the kernel to keep track of all logical network connections, and thereby relate all of the packets which may make up that connection.

When CT is used along with OVS, using an advanced Network Interface Card (NIC) to handle the connections can help to offload OVS.





Goals:

- Based on OVS kernel – using Mellanox TC API
- Need to use an advanced OVS version that is tied up with connection tracking
- VMs should be connected through VFs in advance and all traffic should pass through kernel in the “slow path”
- The 1st packet per flow will reach CT. If CT indicates "flow-established" on this flow and OVS decides that this flow should be offloaded - then the HW switch will be configured to forward this flow on “fast path” through SRIOV.
- In addition – HW switch will be configured to trap for this offloaded flow any TCP packets with the following flags set: FIN, SYN, RST – in order to detect termination or reset of the connection and to remove the fast path entry from HW.
- HW configuration will be done from vswitchd in user space or through the kernel.

Requirements:

Internet Networking Course

Guided by:

