

vSwitch offloading requirements analysis and standard

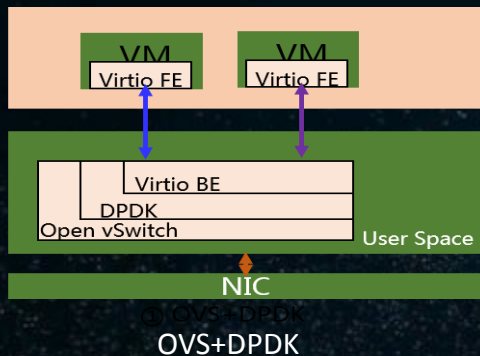
China Mobile
SHASHA GUO , YING LI

Agenda

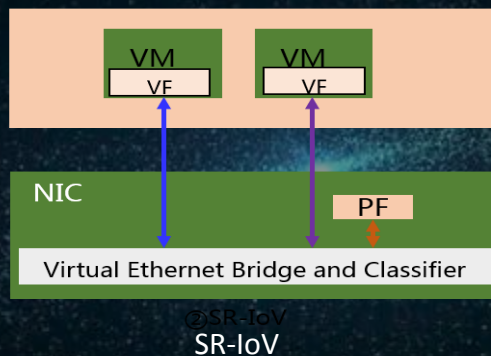
1. vSwitch offloading requirements standard background and analysis
2. Introduction of the standard

vSwitch offloading requirements standard background and analysis

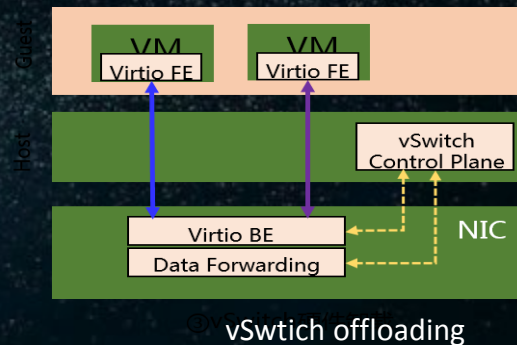
In NFV scenario, communication between virtual machines requires the support of virtualization devices, and currently there are three main ways below.



The OVS+DPDK scheme has a large CPU consumption, which will be further increased with the increase of bandwidth



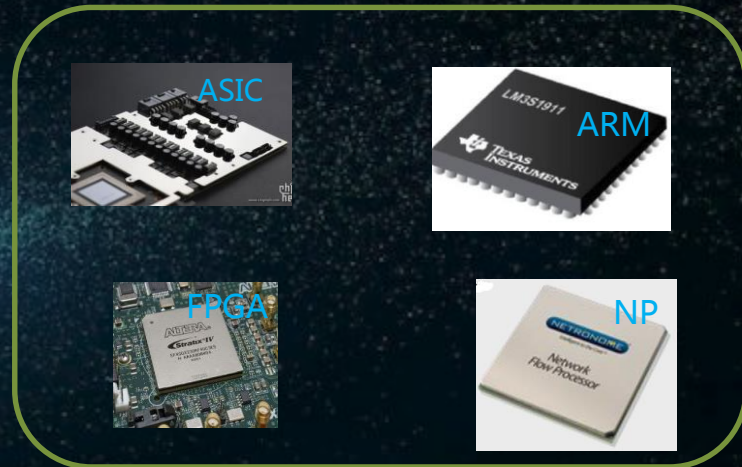
SR-IOV schemes have technical disadvantages in terms of driver binding, flexibility (hot migration) and networking with SDN



vSwitch hardware acceleration refers to the unloading of the vSwitch forwarding function to the accelerating network card, which provides the same flexibility while reducing CPU consumption and providing high forwarding performance

vSwitch offloading requirements standard background and analysis

Current industry actively vSwitch hardware acceleration technology research, which is relatively mature.



hardware

Hardware types: FPGA、SOC、NP、ASIC

FPGA: ecologically open, programmable

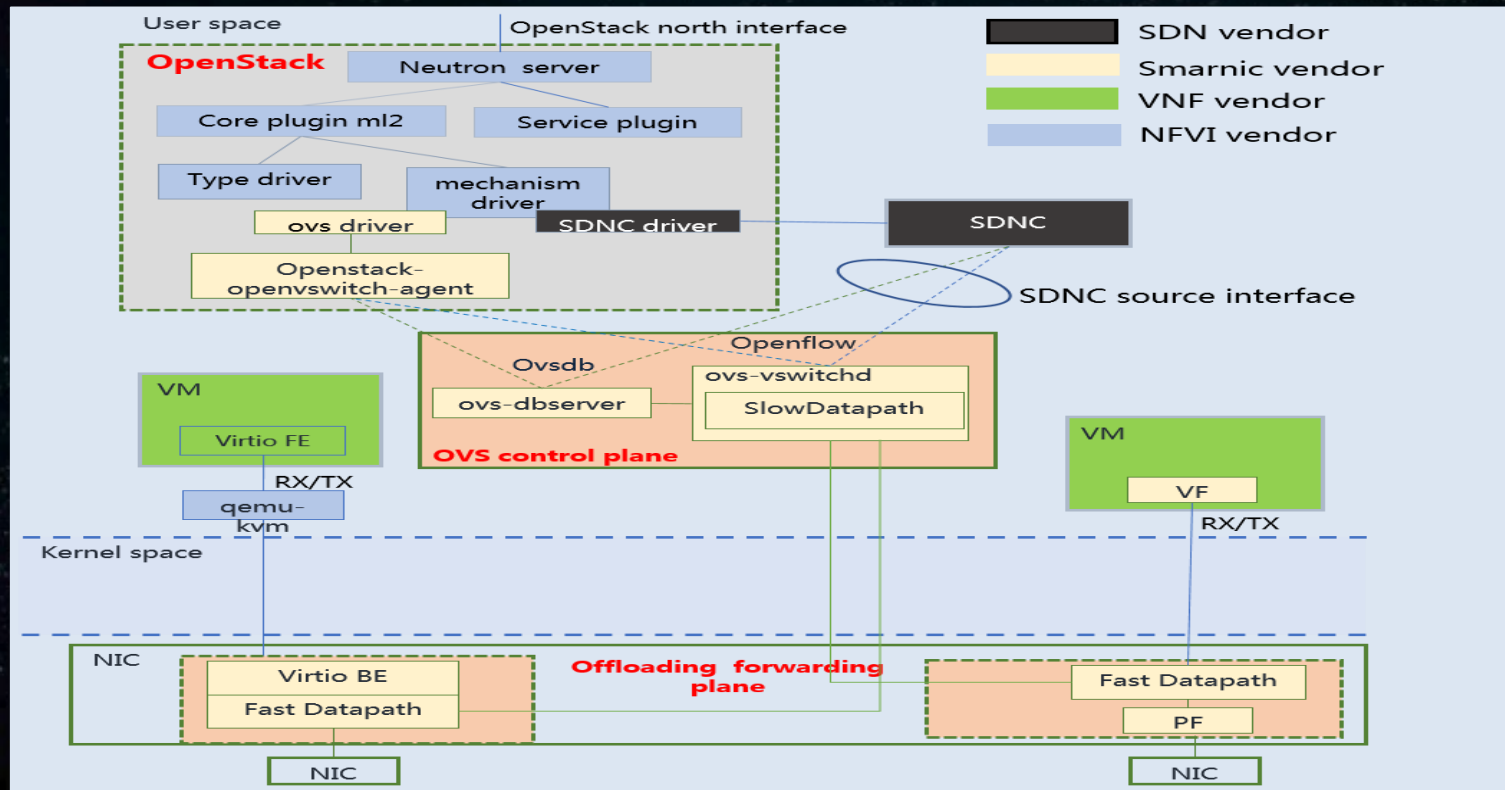
SOC: customized, terminal equipment

NP: Mainstream manufacturers have no roadmap

ASIC: Long production cycle, suitable for large-scale use of mature algorithms and applications

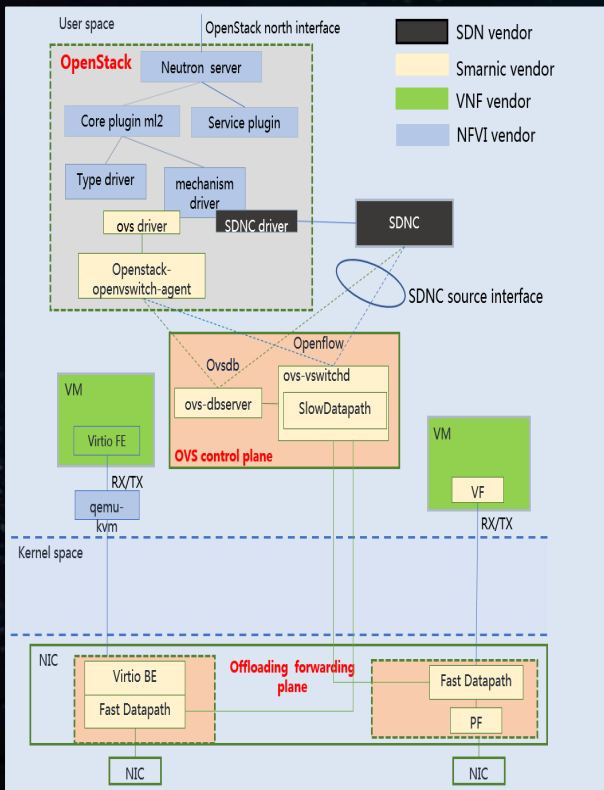
vSwitch offloading requirements standard background and analysis

vSwitch hardware acceleration decoupling scheme analysis.



vSwitch offloading requirements standard background and analysis

vSwitch hardware acceleration decoupling scheme analysis.



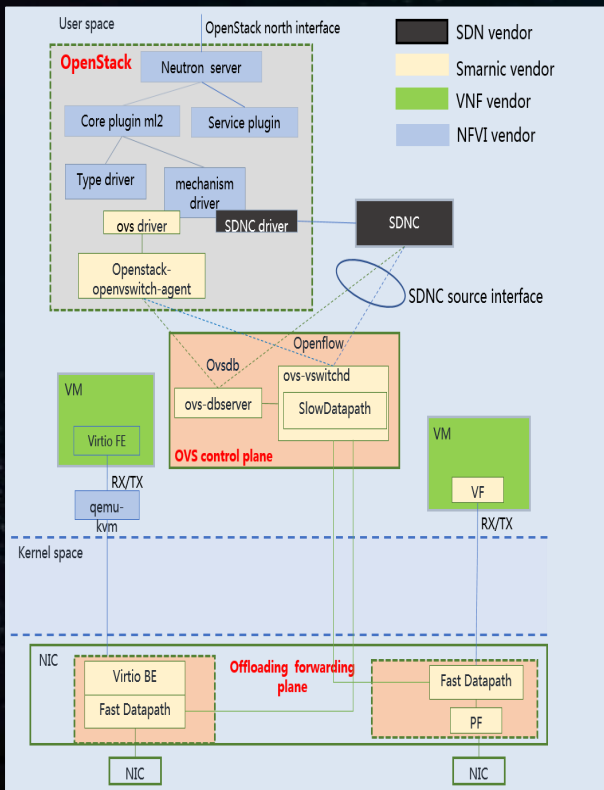
The main problems of unloading are to choose decoupling scheme, to pair with different manufacturers and how to promote the landing.

From the aspects of procurement mode, functional requirements, standardization difficulty and other aspects of decoupling analysis, the following two methods are found to be relatively good.

- ✓ NFVI&vSwitch function&Smarnic
 - Only need to be decoupled from the server, and the decoupling difficulty is small.
 - The procurement mode changes: hard and soft binding, and the virtual layer is required to be purchased together with the accelerated network card

vSwitch offloading requirements standard background and analysis

vSwitch hardware acceleration decoupling scheme analysis.

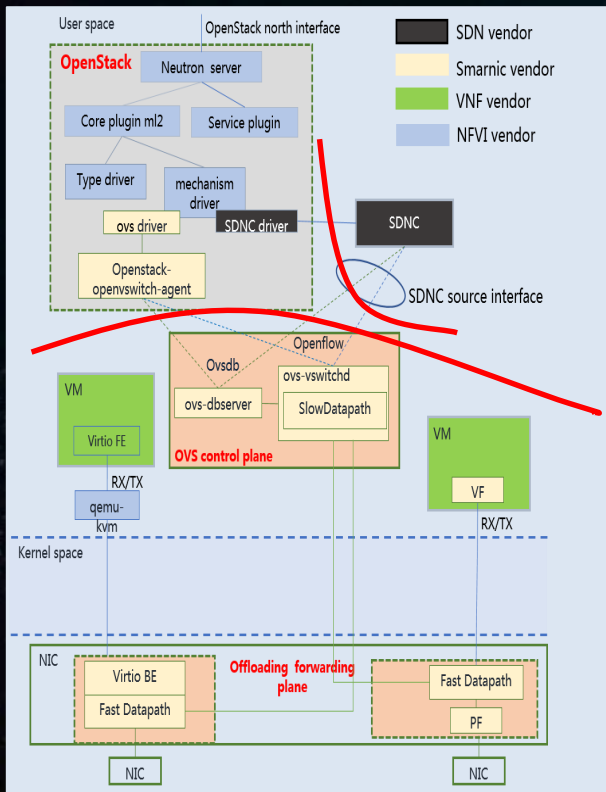


- ✓ NFVI, vSwitch function&smarnic(i)
 - Server network card integration, to solve the second and third layer network forwarding work, more in line with the NFV architecture
 - The vSwitch functions are implemented by the acceleration card manufacturers without the need to establish a protocol-level interface.
 - The acceleration card needs to do kernel version and other adaptation work to the virtual layer

From the aspects of procurement process, agile development, rapid deployment, simple operation and maintenance, it is suggested to adopt plan 5, that is, the decoupling scheme of vSwitch and Hypervisor, the vSwitch function is provided by the accelerated network card manufacturer, and the vSwitch is integrated by the virtual layer manufacturer.

vSwitch offloading requirements standard background and analysis

vSwitch hardware acceleration decoupling scheme analysis.



The decoupling scheme of vSwitch hardware acceleration and SDN needs to be considered as a whole. Under the fusion scheme of vSwitch unloading and SDN, the (i) decoupling scheme of the previous page, decoupling of SDNC and vSwitch, and the standardized OpenFlow and OVSDDB protocols.

Agenda

1. vSwitich offloading requirements standard background and analysis
2. Introduction of the vSwitich offloading requirements standard

Introduction of the vSwitch offloading requirements standard

Accelerate network card configuration requirements

index	Claim
size	Not higher than full height
Number of physical port ports	2
Physical port bandwidth	25G
Number of vNICs	64
PCIe	PCIe3.0 X16 or two X8 channels
Number of flow tables	64 k
Power consumption	Full load when < 75W

Introduction of the vSwitich offloading requirements standard

Functional requirement

- Network Isolation and Address Multiplexing
- MTU adjustable
- Multicast
- promiscuous mode
- port aggregation
- Support vNIC multi-queue
- Virtual machine migration
- Virtual machine data access

- VLAN transparent transmission
- supports IPv4 and IPv6
- Requires support for bandwidth-based bidirectional QoS.
- Traffic statistics and reporting
- SDN compatibility requirements
- Cyborg (optional)

Introduction of the vSwitch offloading requirements standard

Other requirement

- Performance requirements
- Reliability requirements
- Virtual layer compatibility requirements
- Alarm collection and management promiscuous mode

Introduction of the vSwitch offloading requirements standard

The details information about the standard you can find by the link below:

vswitch hardware acc tech requirements :

<https://gerrit.opnfv.org/gerrit/c/rocket/+/69340>

THANKS!

Q&A

guoshasha@chinamobile.com