# Network Cloud Family
Akraino Release 2 Continued

Jeff Collins

PTL for Unicycle with OVS-DPDK Blueprint

& OVS-DPDK Feature Project

Network Cloud Unicycle Blueprint with OVS-DPDK

› New SPECIES to add OVS-DPDK support into existing Network Cloud Unicycle Blueprint Family

› Joint community effort by Ericsson and AT&T

› Integration with feature project to add OVS-DPDK support to Airship distribution

› Based on Dell PowerEdge R740XD Servers to deploy kubernetes (undercloud) and containerized Openstack platform (overcloud) using Airship

› VNF Orchestration using ONAP
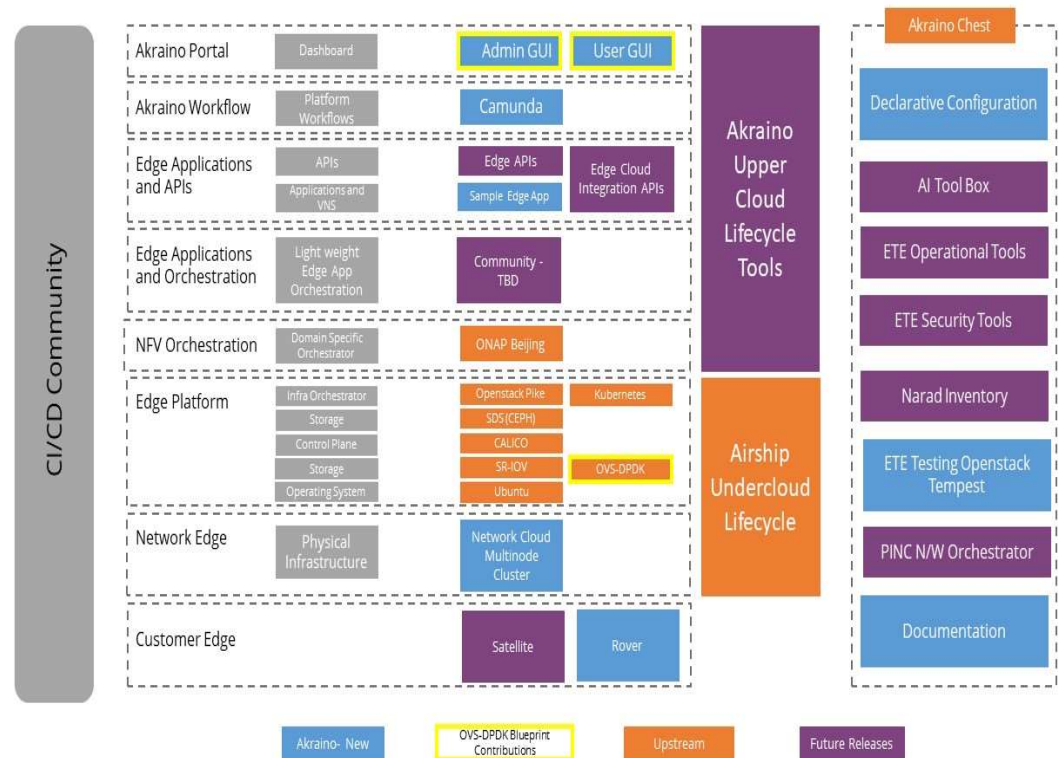
Packet Processing Options
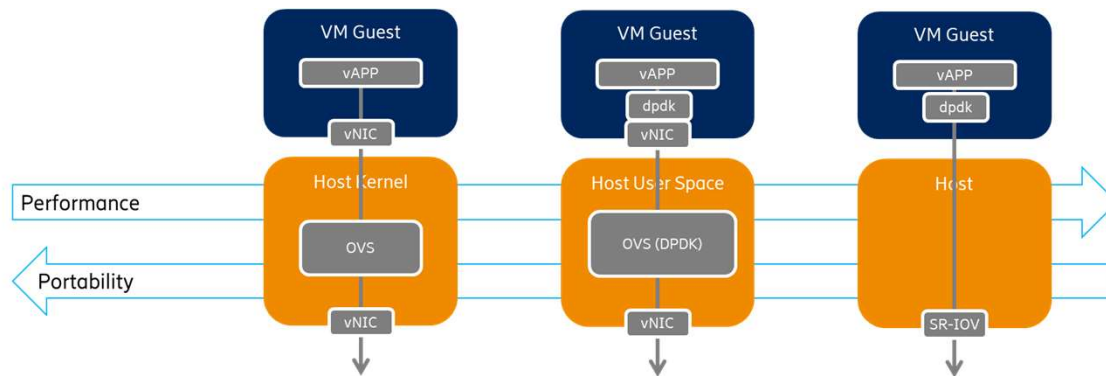
Interface from application	To VNIC via sockets (Linux kernel)	Direct to VNIC using DPDK	To physical NIC via virtual function (e.g., SR-IOV)
Comments	+ High portability - Poor performance	+ Good portability + Good performance for most use cases + Functionality in open source, outside the VM	+ Good performance for most use cases - HW dependency and vendor lock-in - Functionality pushed to VM

OVS-DPDK Software Stack

userspace

OVS
vswitchd
DPDK

Neutron

Nova

VM

VM

libvirt / qemu

K8s

Docker

kernel

NICs
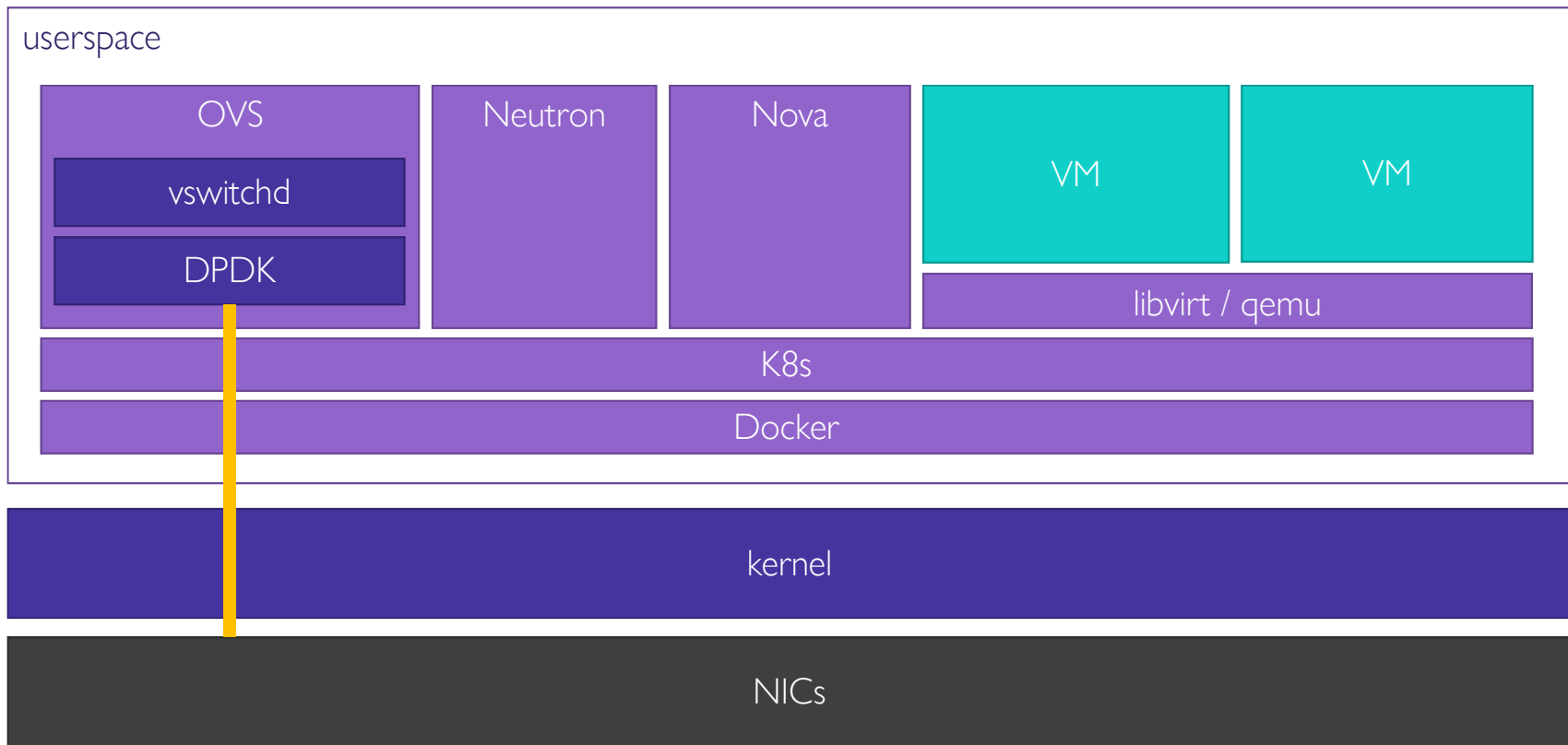
OVS-DPDK Core Components

openvswitch-vswitchd	openvswitch-db	neutron-ovs-agent	"other Neutron components"

› OpenVswitch
  › Functionality split in two pods

› openvswitch-db
  › OVSDB server and database

› openvswitch-vswitchd
  › DPDK-enabled userspace switch

› Neutron
  › Functionality spread across 10+ pods

› neutron-ovs-agent
  › Performs configuration of OVS
  › DPDK specific operations
    › Loading of kernel modules
    › Binding of NICs to DPDK
    › Creation of DPDK-enabled bridges
    › Adding of DPDK ports (NICs) to bridges
    › Configuration of IPs for overlay tunneling

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DPDK Configuration for OpenStack-Helm

openvswitch-vswitchd	openvswitch-db	neutron-ovs-agent	"other Neutron components"

› New configuration parameters

› New configuration parameters

Hugepage configuration

```
resources:
  enabled: false
  ovs:
    vswitchd:
      requests:
        memory: "128Mi"
        cpu: "100m"
      limits:
        memory: "1024Mi"
        cpu: "2000m"
        hugepages-1Gi: "1Gi"
        # hugepages-2Mi: "512Mi"
```

DPDK configuration

```
dpdk:
  enabled: false
  socket_memory: 1024
  hugepages_mountpath: /dev/hugepages
  mem_channels: 4
  lcore_mask: 0x1
  pmd_cpu_mask: 0x4
```

OVS agent configuration

```
ovs_dpdk:
  enabled: false
  driver: uio_pci_generic
  nics:
    - name: dpdk0
      pci_id: '0000:05:00.0'
      bridge: br-phy
      migrate_ip: true
      n_rxq: 2
      pmd_rxq_affinity: "0:3,1:27"
      ofport_request: 1
  bridges:
    - name: br-phy
```

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OVS-DPDK Contributions

› Extension of the Network Cloud blueprint

   › Additional DPDK-specific configuration

   › New set of templates to render DPDK configuration for Airship

› OpenStack Helm

   › Extension of helm charts for DPDK

   › Uplift of Ubuntu version and images (Xenial -> Bionic)

   › Documentation: DPDK specific configuration and troubleshooting guide

› Akraino Release 2

   › Uplift configuration to Airship v1.3 based on SR-IOV blueprint

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References

› Project wiki
  › https://wiki.akraino.org/display/AK/Support+of+OVS-DPDK+in+Airship

› Airship
  › https://www.airshipit.org/

› OpenStack-Helm
  › https://github.com/openstack/openstack-helm

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