

The Cloud in the Wild: How everyone is using Cloud !

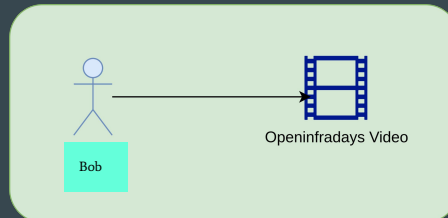


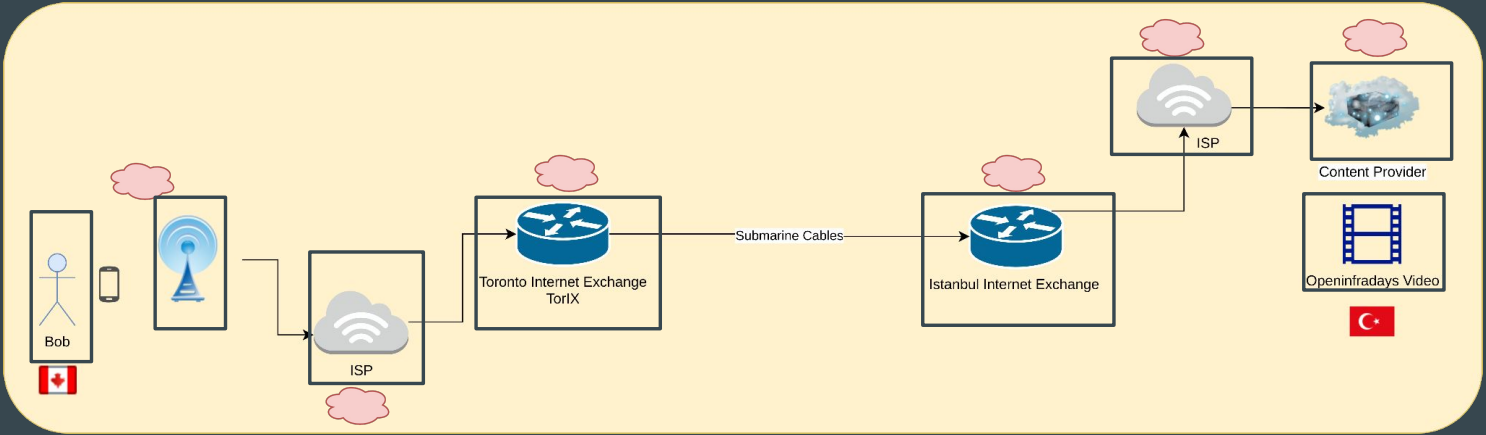
Mohamed Elsakhawy, PhD.

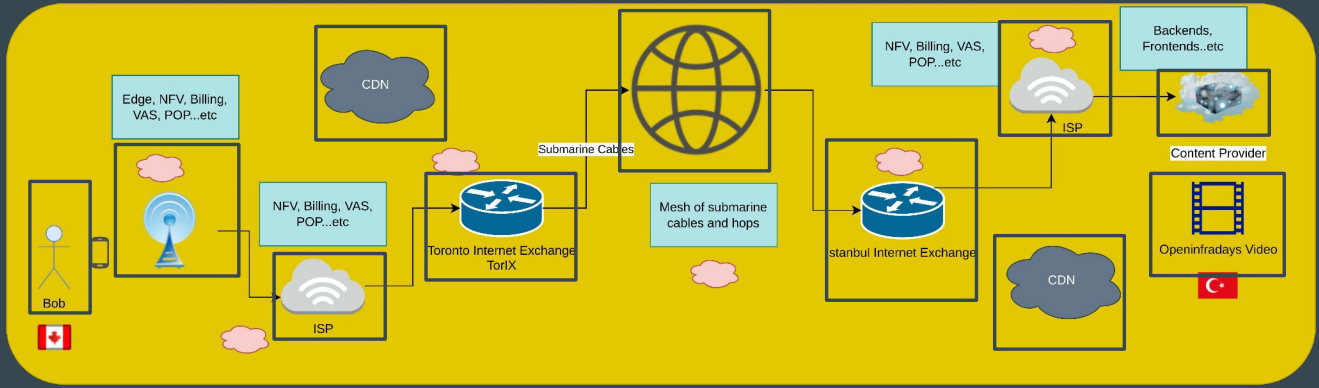
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Cloud Computing: Where is it ?

- Everywhere
- Imagine someone watching the OpenInfra video







More Hops = More Latency !

Industry Adoption of Openstack

- Massive presence in different sectors
 - Internet sector (Domain registrar's , VOIP, Hosting..etc)
 - Teleco
 - Finance
 - HPC, R&D sectors
 - CERN Openstack Clouds, Canada's NDRIO Clouds, Swedish SNIC Science Cloud
 - Academia

Challenges

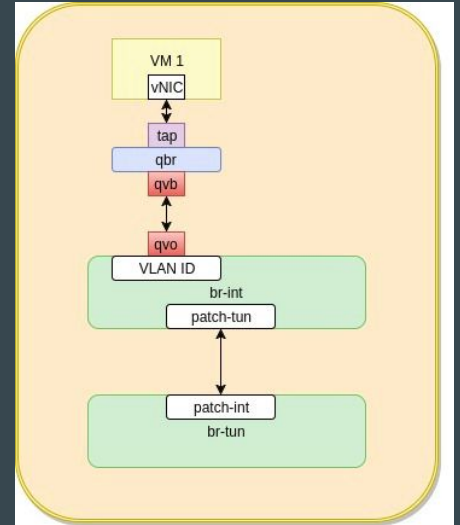
- Different sectors
 - A broad range of requirements
 - Not all are natively supported
 - **Performance metrics are diverse**
 - General purpose clouds
 - Purpose specific clouds (GPU, HPC, NFV...etc)
 - Different scales
 - Few servers to thousands (or tens of!)
 - Teleco
 - HPC
 - Different user-base
 - Expert users
 - Users with little tech background

Openstack's virtual networking

- The good old linuxbridge
 - Still used in production deployments
 - Featureset limitations
- Openvswitch
 - Rich featureset
 - Complex deployments
- OVN
 - A more native approach with minimal agents

A very useful comparison

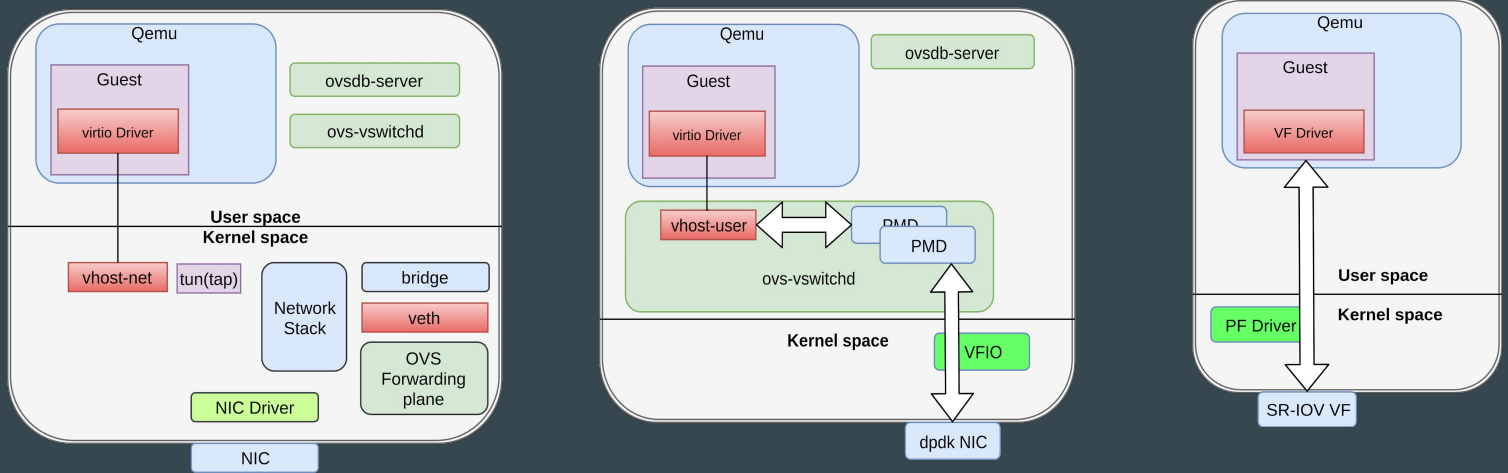
<https://docs.openstack.org/networking-ovn/latest/faq/index.html>



But Generic networking isn't for everyone !

- Low latency , high-throughput workloads
 - Ever tried deploying a virtual supercomputer in the cloud ?
 - Infiniband/ Omni-path
 - VOIP, NFV .etc
- Multiple paths
 - DPDK
 - SRIOV
 - Direct passthrough ?

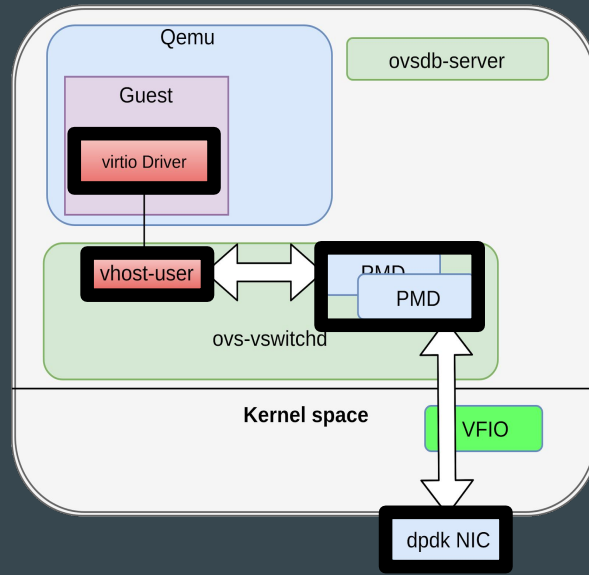
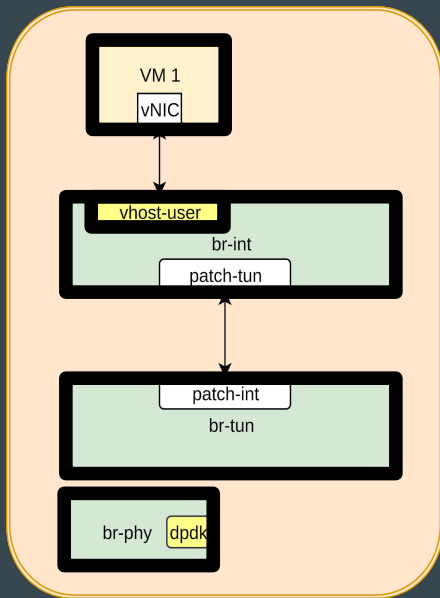
Generic Networking vs SRIOV and DPDK



SRIOV: Single-root input/output virtualization

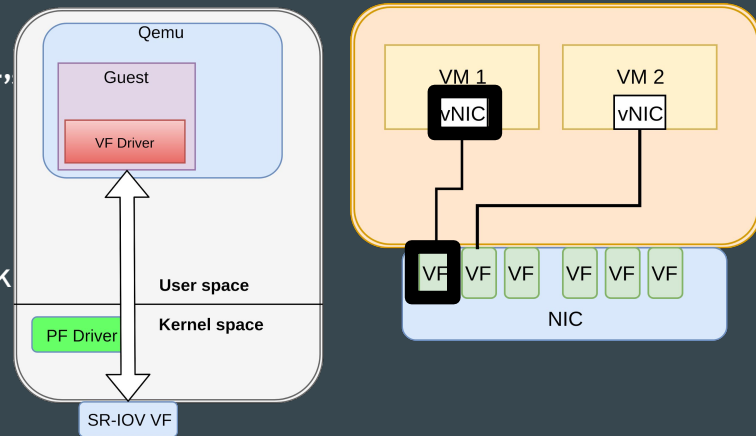
DPDK: Data Plane Development Kit

Layout of DPDK Enabled Openstack Deployment



Layout of SRIOV Openstack Deployment

- Virtualization of Input/Output devices
- Physical Functions "PF" vs Virtual Functions "VF"
- Single PF, many VFs
- VMs have direct access to VFs
- No host/switching overhead, i.e. no OVS
- VM communicates directly with physical network



Words of Advice

- Stay mainstream
 - Custom ad-hoc solutions will bite you, if not now then later !
- Be Modular
 - Build around components
- Know your use-case
 - Requirements now
 - And the future !
- Governance is very important
 - The cloud is not an infinite pool of resources
 - It can be flexible at accommodating requirements
 - At a cost !

Thank you !