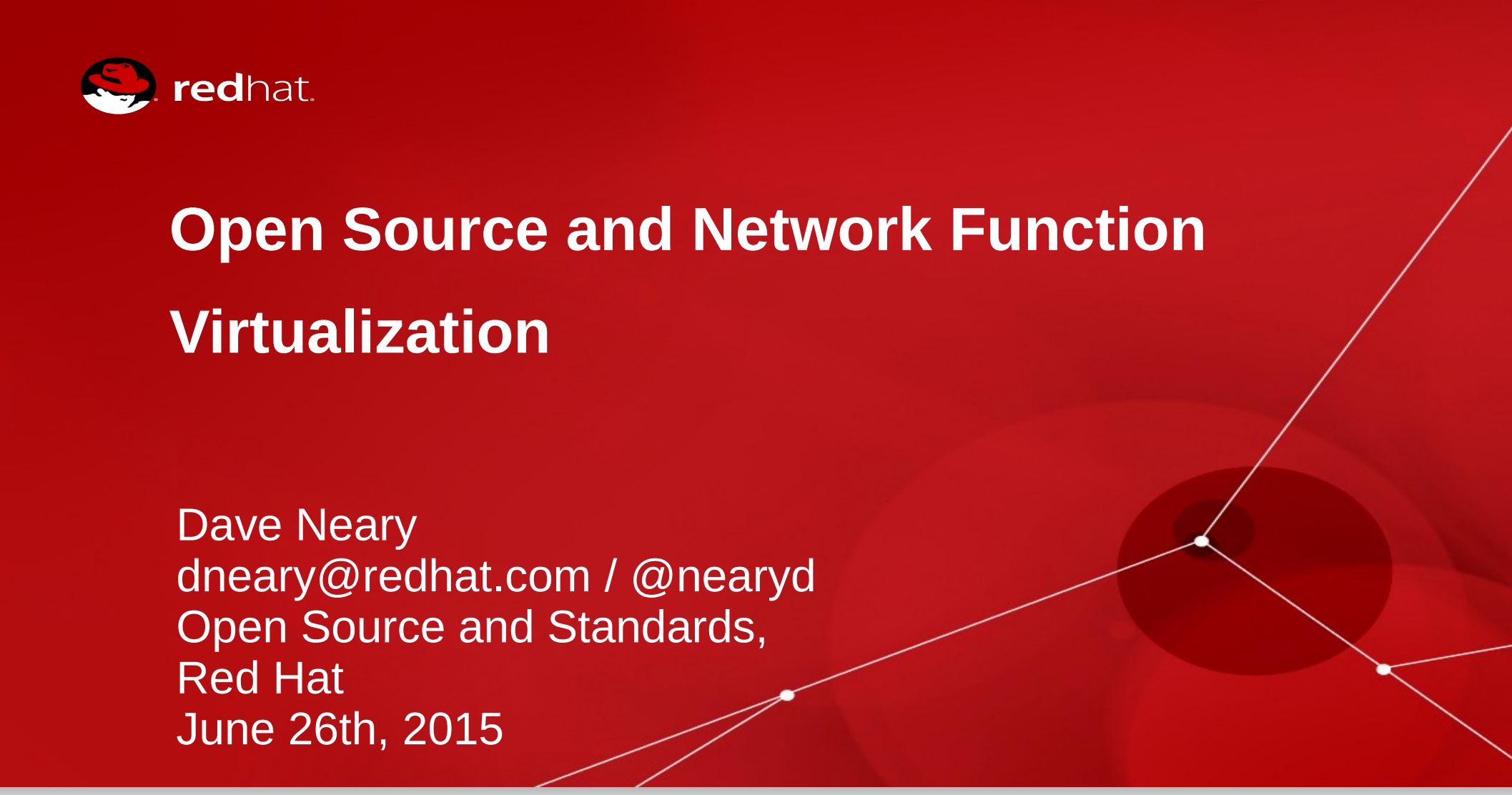


Open Source and Network Function Virtualization

Dave Neary
dneary@redhat.com / @nearyd
Open Source and Standards,
Red Hat
June 26th, 2015

Agenda

1. What is NFV?
2. Why are telcos investing in NFV?
3. Open source for NFV
4. Filling in the gaps

1. What is NFV?

What is NFV?

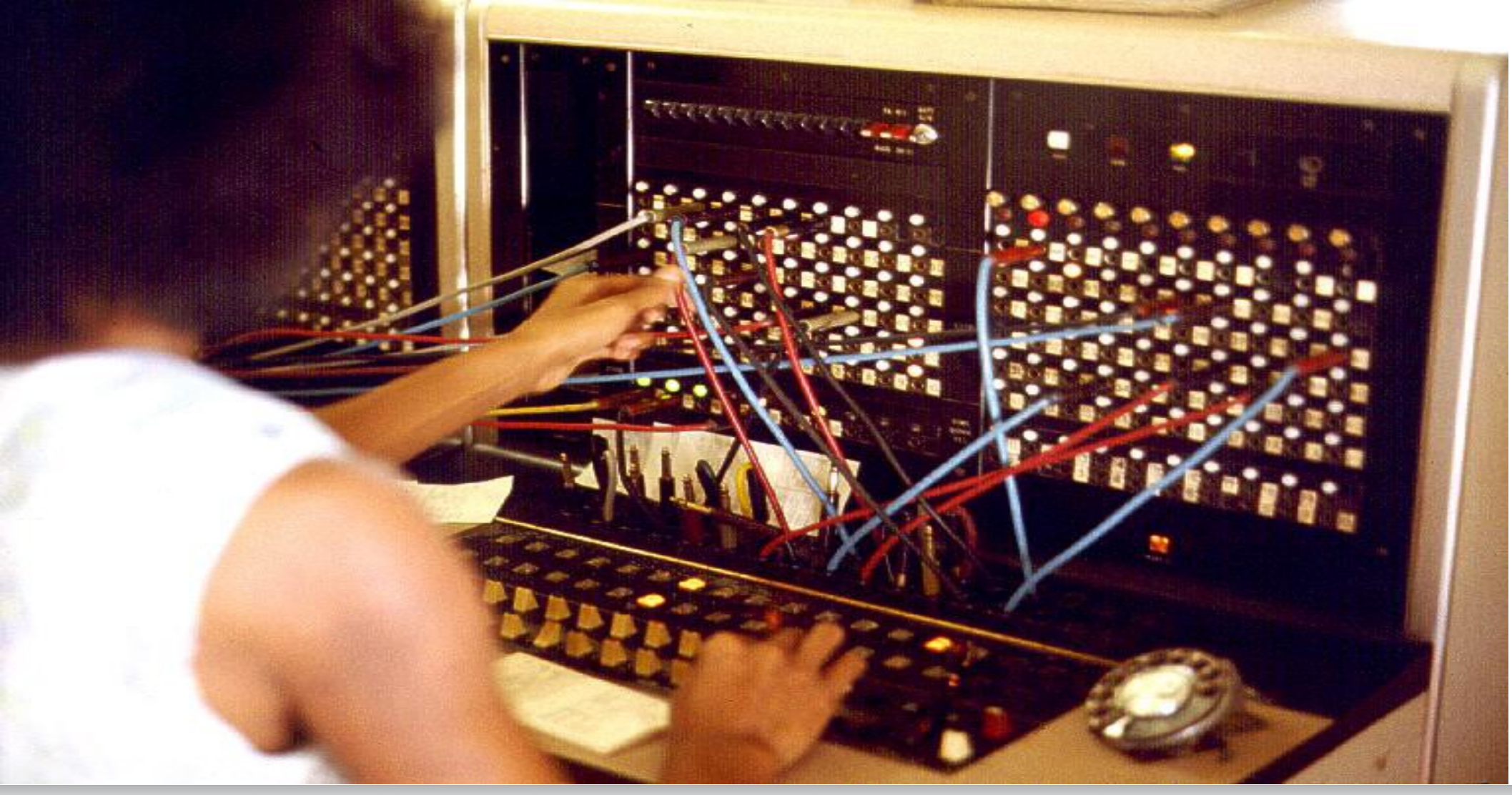
“NFV is a network architecture concept that proposes using IT virtualization related technologies to virtualize entire classes of network node functions into building blocks that may be connected, or chained, together to create communication services”

Wikipedia:
http://en.wikipedia.org/wiki/Network_Functions_Virtualization

What is NFV, in simple terms?

Telcos are replacing specialized hardware with VMs running on commodity hardware

2. Why do telcos care?

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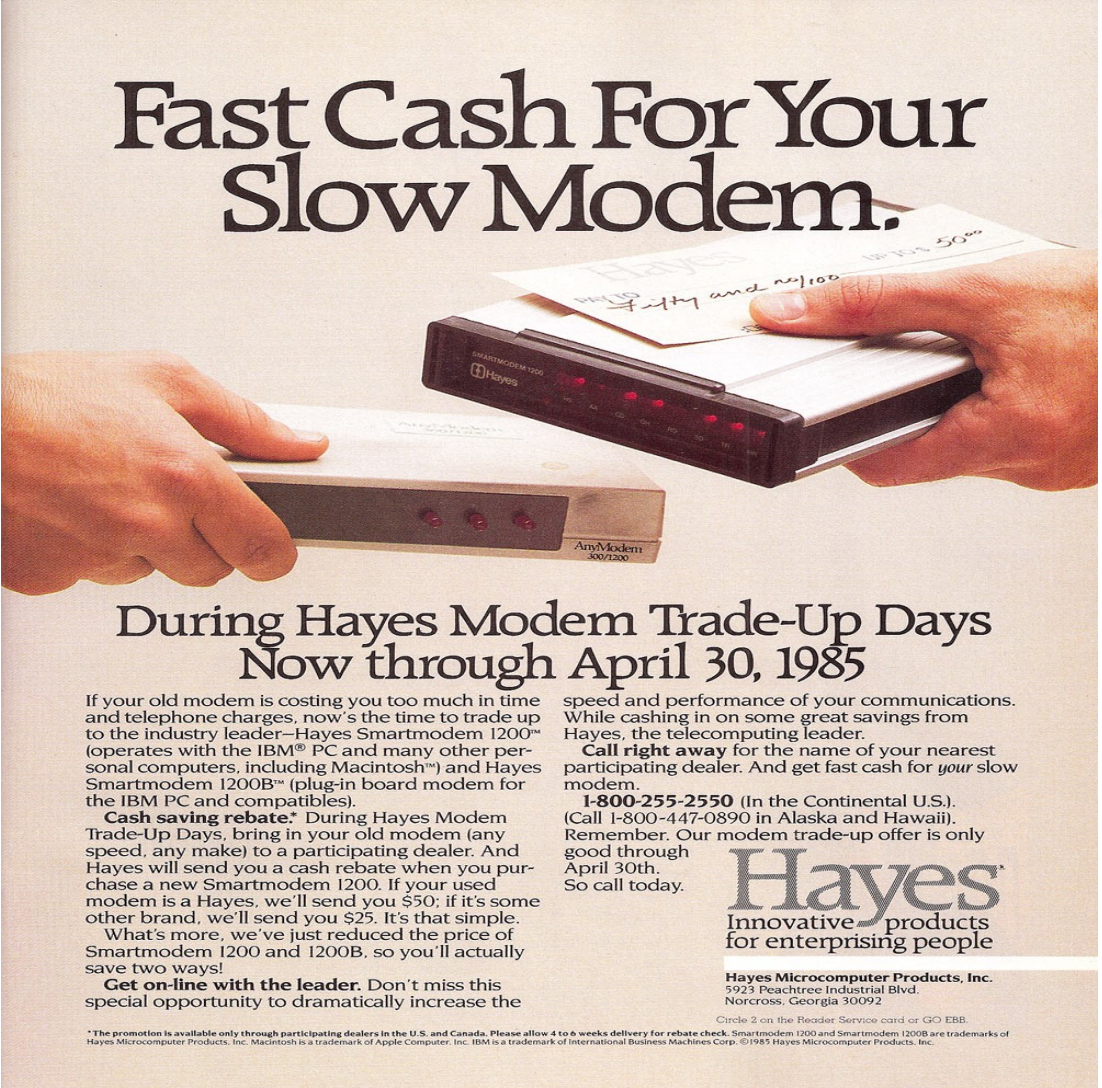

Fast Cash For Your Slow Modem.
During Hayes Modem Trade-Up Days
Now through April 30, 1985
If your old modem is costing you too much in time and telephone charges, now's the time to trade up to the industry leader—Hayes Smartmodem 1200™ (operates with the IBM® PC and many other personal computers, including Macintosh™) and Hayes Smartmodem 1200B™ (plug-in board modem for the IBM PC and compatibles).
Cash saving rebate.* During Hayes Modem Trade-Up Days, bring in your old modem (any speed, any make) to a participating dealer. And Hayes will send you a cash rebate when you purchase a new Smartmodem 1200. If your used modem is a Hayes, we'll send you $50; if it's some other brand, we'll send you $25. It's that simple.
What's more, we've just reduced the price of Smartmodem 1200 and 1200B, so you'll actually save two ways!
Get on-line with the leader. Don't miss this special opportunity to dramatically increase the speed and performance of your communications. While cashing in on some great savings from Hayes, the telecomputing leader.
Call right away for the name of your nearest participating dealer. And get fast cash for your slow modem.
1-800-255-2550 (In the Continental U.S.). (Call 1-800-447-0890 in Alaska and Hawaii). Remember. Our modem trade-up offer is only good through April 30th. So call today.
Hayes
Innovative products for enterprising people
Hayes Microcomputer Products, Inc.
5923 Peachtree Industrial Blvd.
Norcross, Georgia 30092
Circle 2 on the Reader Service card or GO EBB.
*The promotion is available only through participating dealers in the U.S. and Canada. Please allow 4 to 6 weeks delivery for rebate check. Smartmodem 1200 and Smartmodem 1200B are trademarks of Hayes Microcomputer Products, Inc. Macintosh is a trademark of Apple Computer, Inc. IBM is a trademark of International Business Machines Corp. ©1985 Hayes Microcomputer Products, Inc.


NOKIA
NOKIA
NOKIA
22:18
08-01-2006
ERICSSON

Telco services - access

- Dial-up
- ISDN
- ADSL
- Cable
- Fibre optic
- 3G/4G
- Satellite

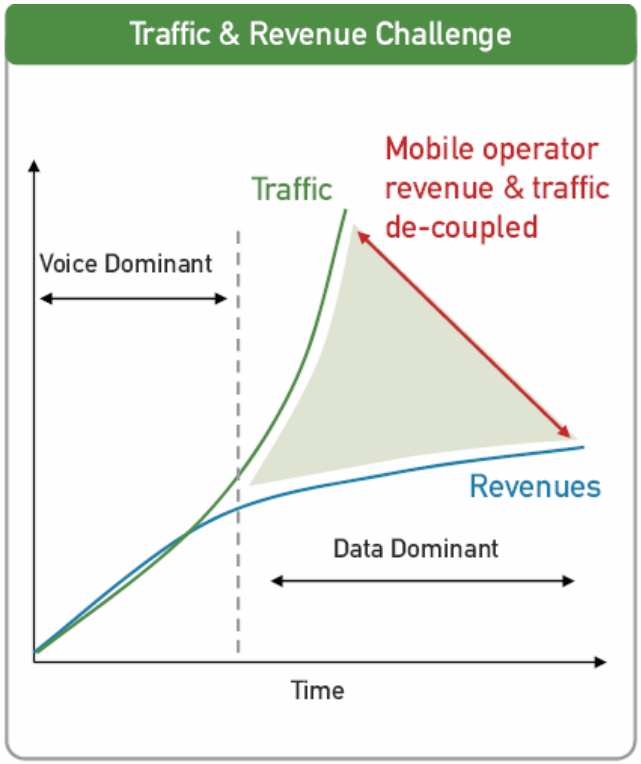
Telco services - applications

- Voice
- Internet/data
- Live TV/streaming
- VOD
- DVR
- TV Guide
- SMS/MMS
- Games
- VoIP
- Voicemail
- Premium services
- ...

Telcos provide more services today than ever before

Telco industry more competitive than ever

- Costs dominated by data usage
- Customers expect more data for less
- Demand for new services increasing



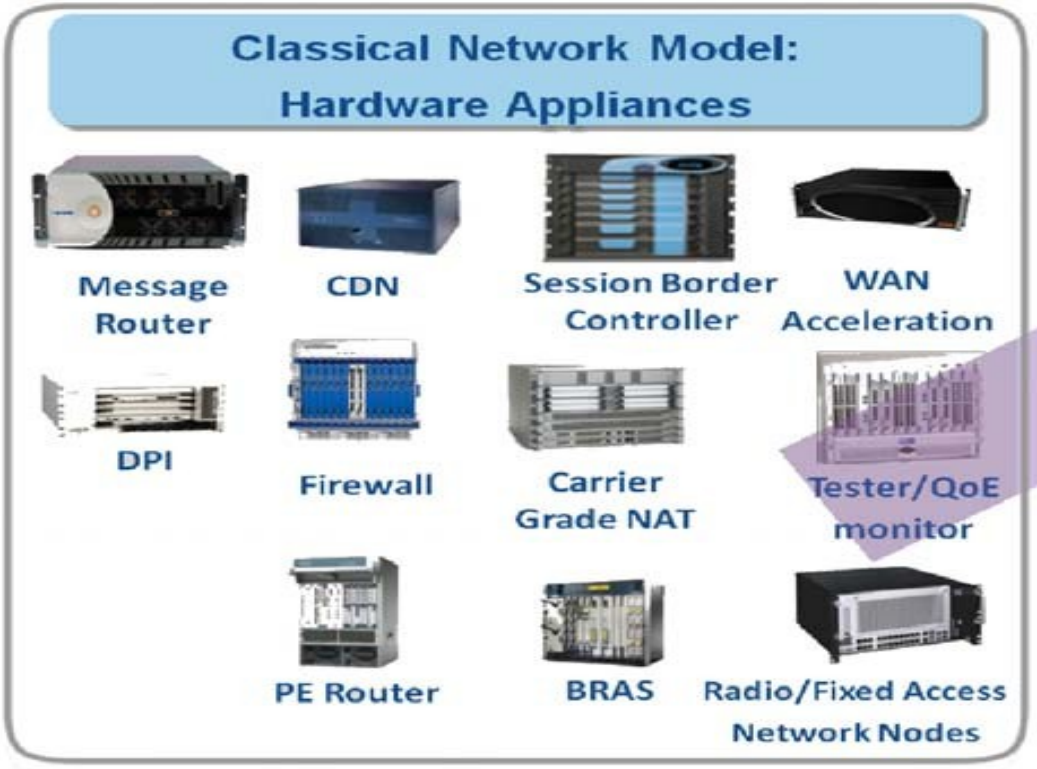
The promise of NFV

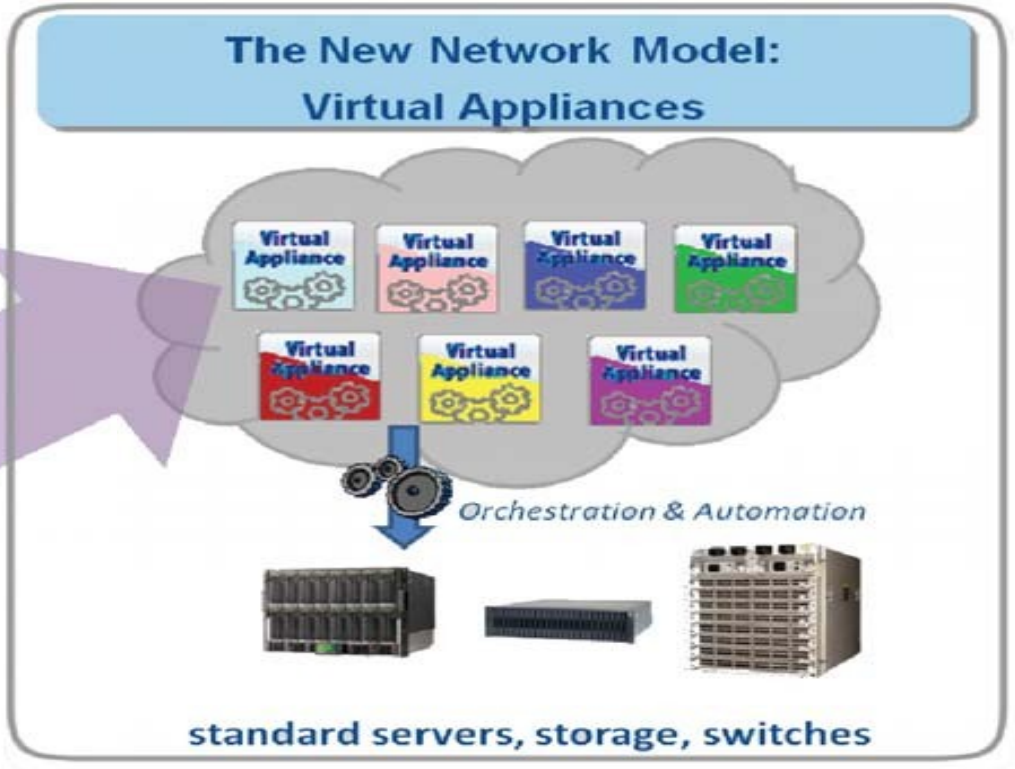
Increased agility

Reduced CapEx, OpEx

What is a network node function?

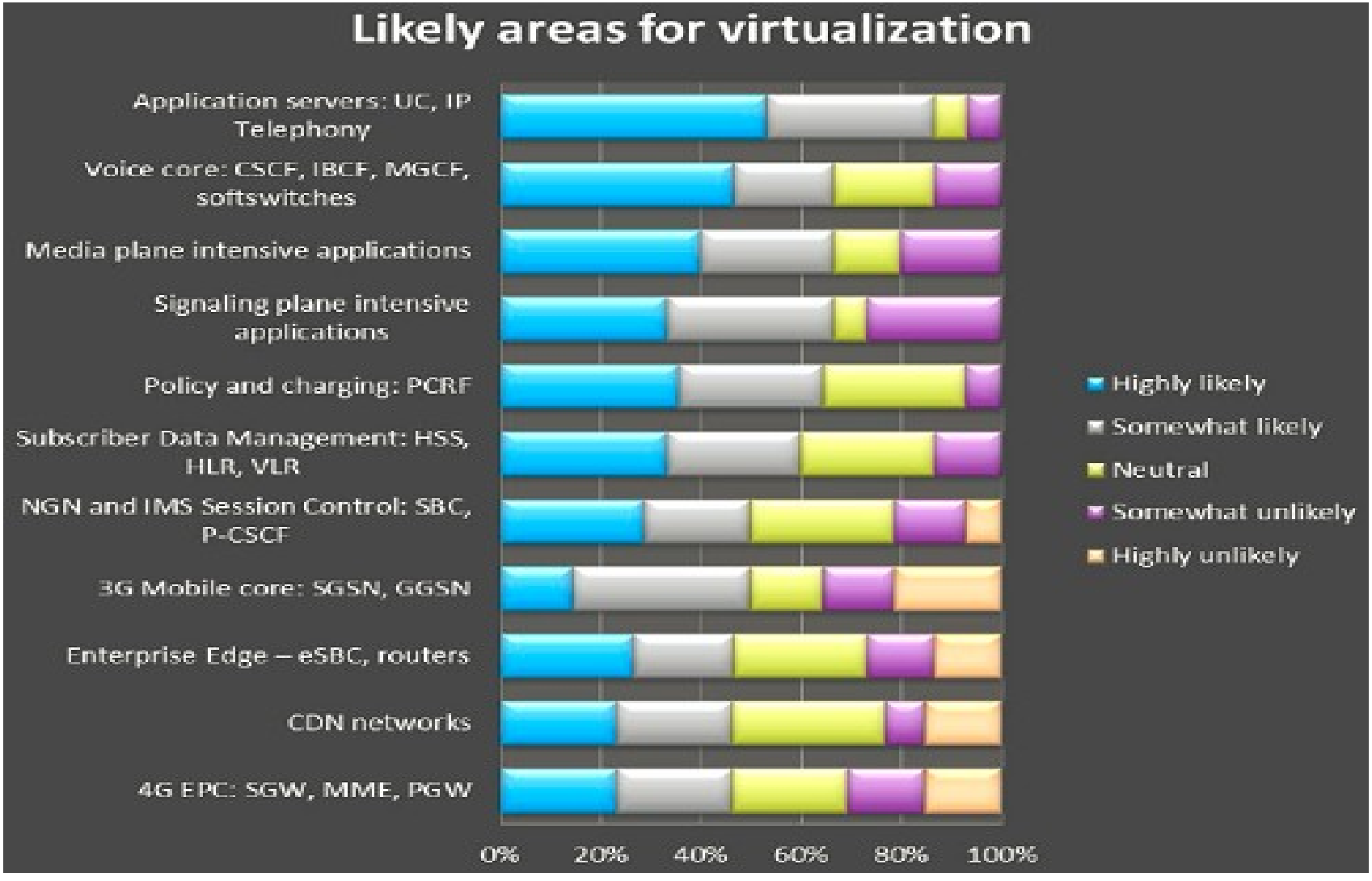
Network functions





“Middleboxes”

- Act on data going through the network
- Examples: Load balancer, gateway, IDS, VPN endpoint, NAT, firewall
- Not just telco


Likely areas for virtualization
Application servers: UC, IP Telephony
Voice core: CSCF, IBCF, MGCF, softswitches
Media plane intensive applications
Signaling plane intensive applications
Policy and charging: PCRF
Subscriber Data Management: HSS, HLR, VLR
NGN and IMS Session Control: SBC, P-CSCF
3G Mobile core: SGSN, GGSN
Enterprise Edge – eSBC, routers
CDN networks
4G EPC: SGW, MME, PGW
0%
20%
40%
60%
80%
100%
Highly likely
Somewhat likely
Neutral
Somewhat unlikely
Highly unlikely

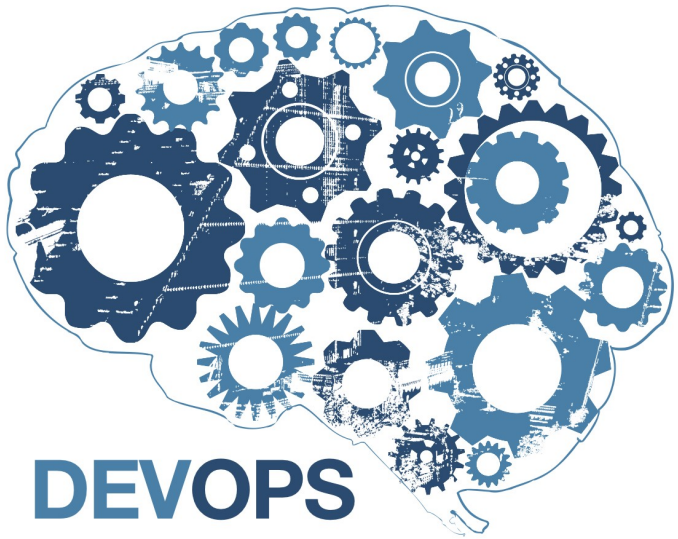
3. Open Source and NFV

Why Open Source?

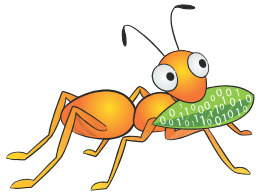
Cloud

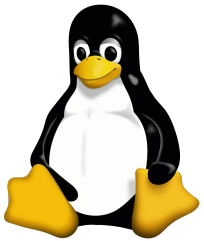
Private cloud

DevOps and agile development



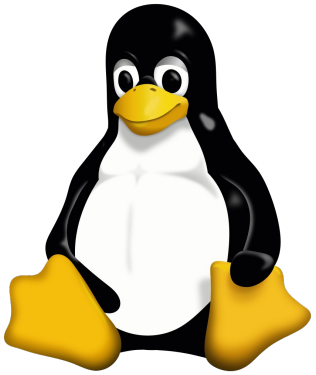
Open source drives the cloud



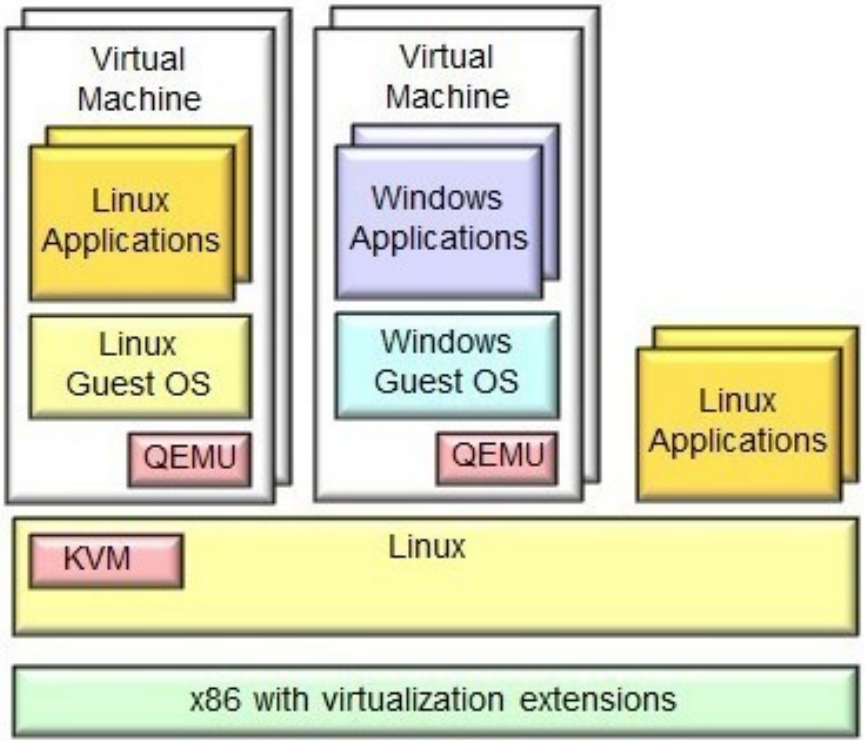


The Open Source NFV Platform

Virtual compute

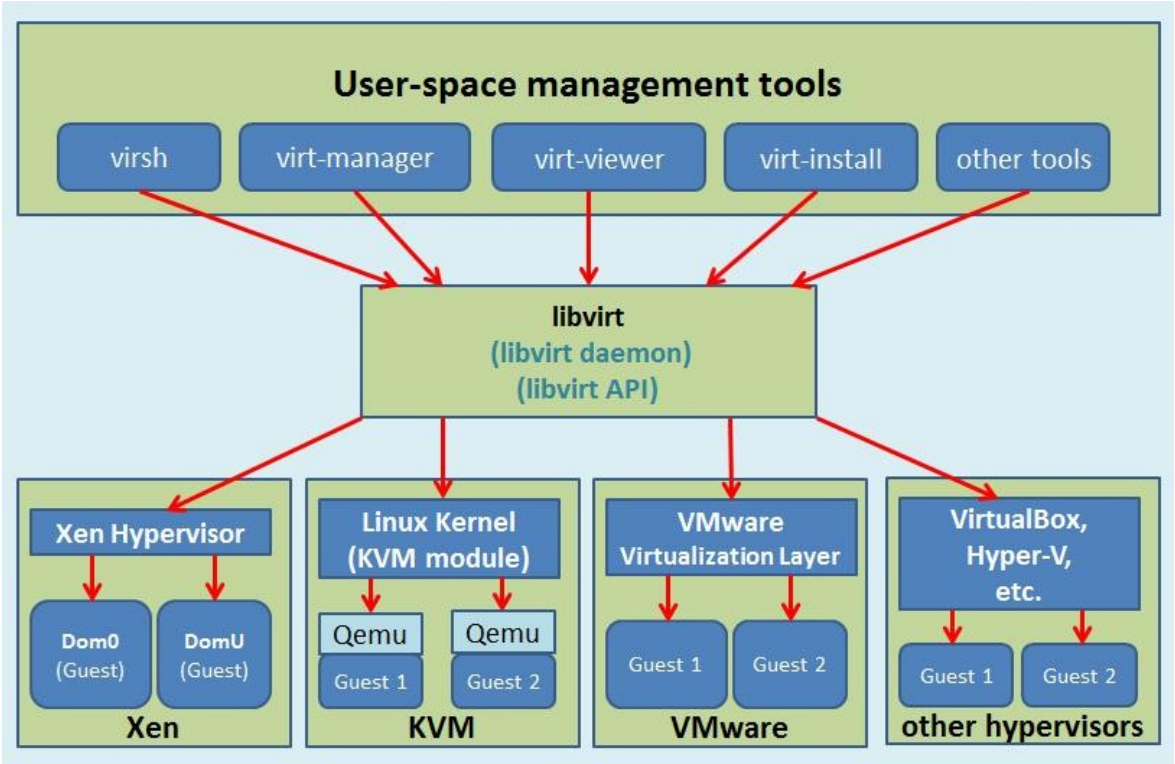


QEMU/KVM



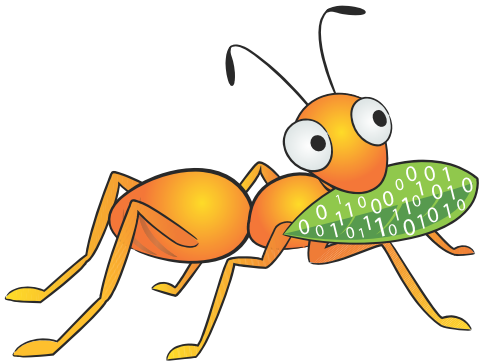
http://wiki.qemu.org

libvirt



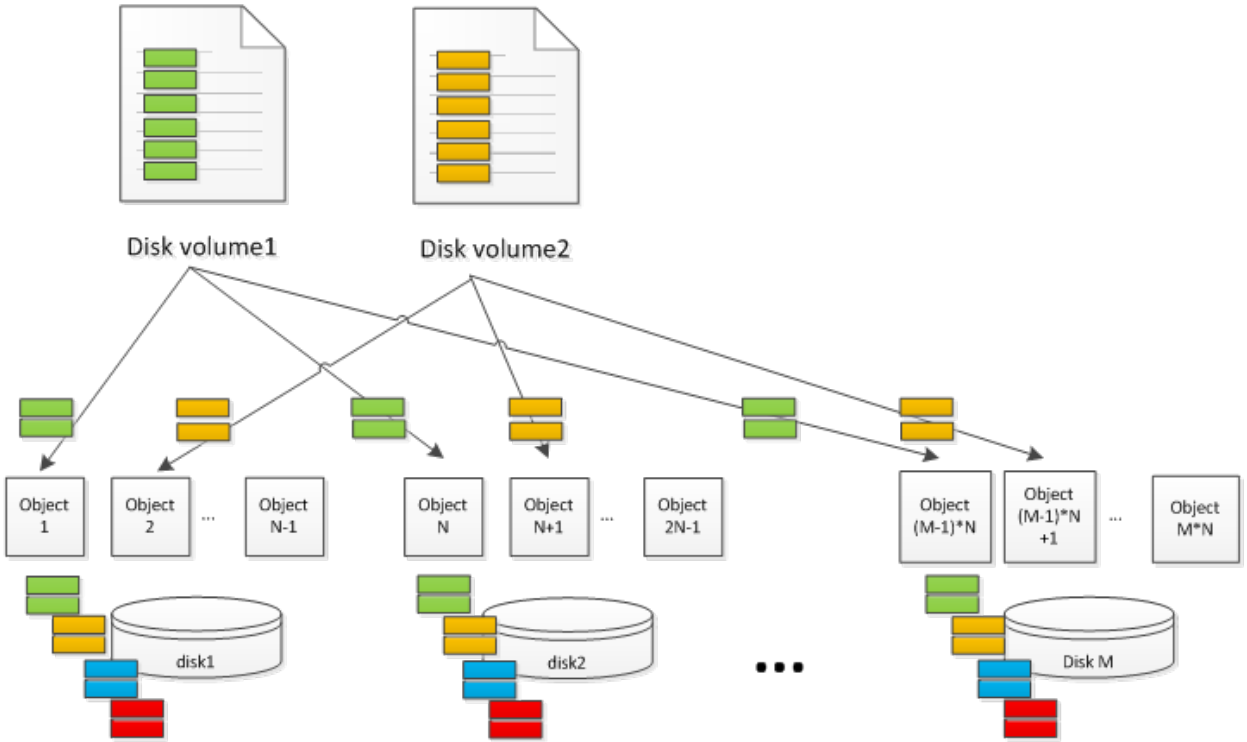
http://www.libvirt.org

Virtual storage



ceph

Ceph



http://www.ceph.com

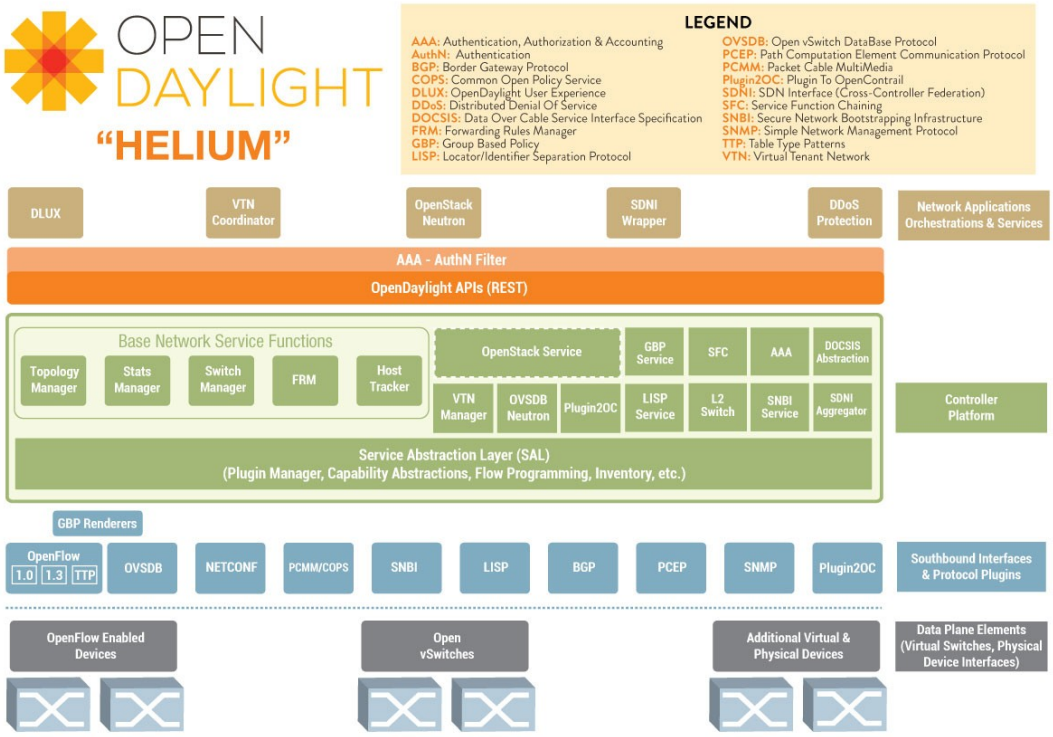
Virtual network

OPEN vSWITCH

An Open Virtual Switch

DPDK

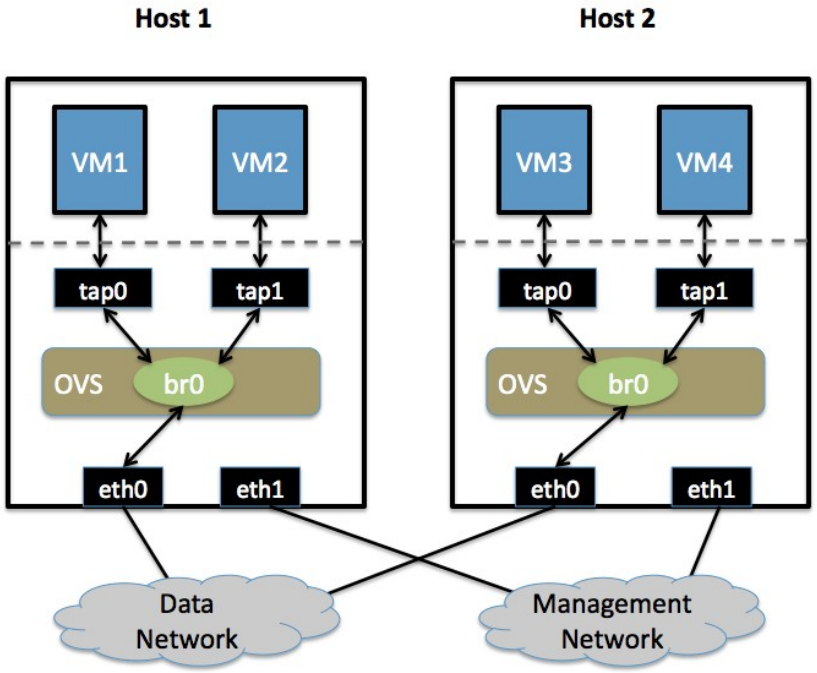
OpenDaylight



http://www.opendaylight.org

Open vSwitch

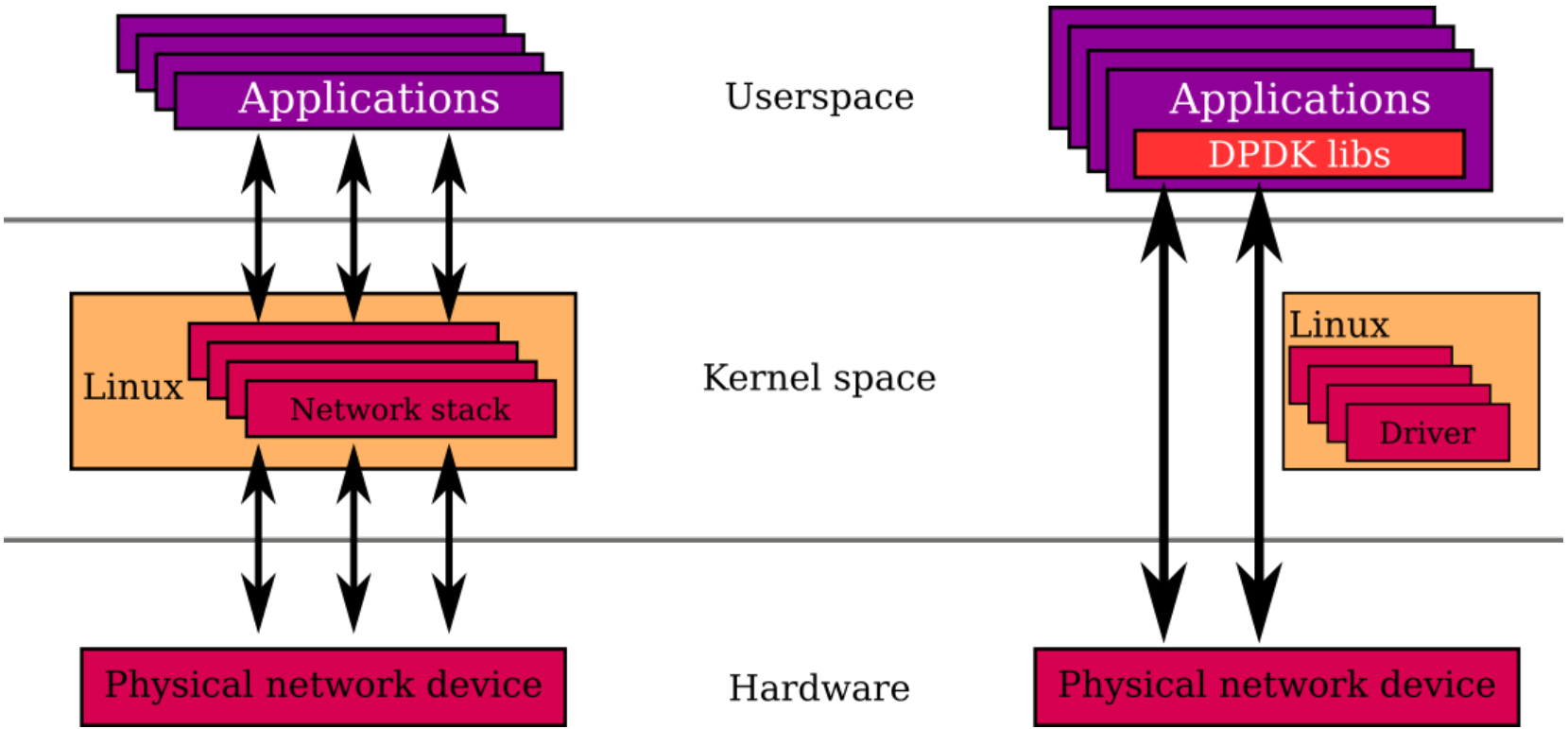
OPEN vSWITCH
An Open Virtual Switch



http://www.openvswitch.org

DPDK

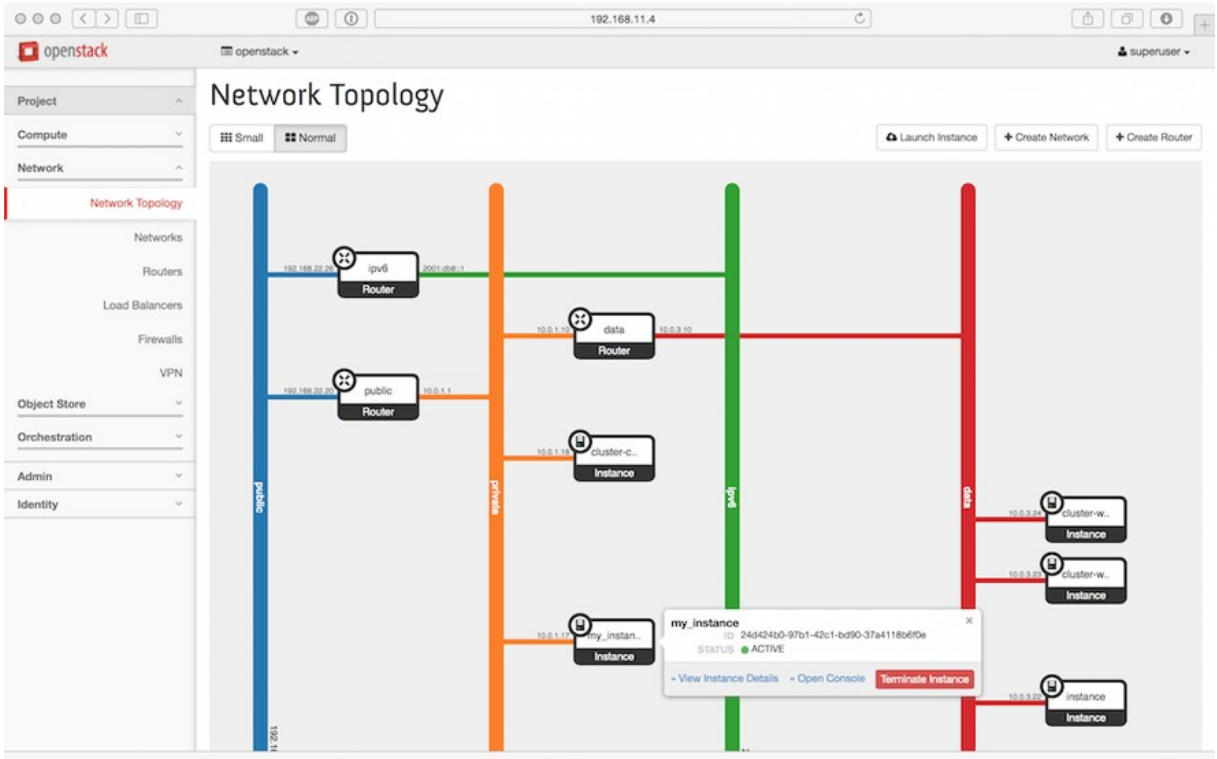
DPDK



http://www.dpdk.org

Virtual infrastructure management

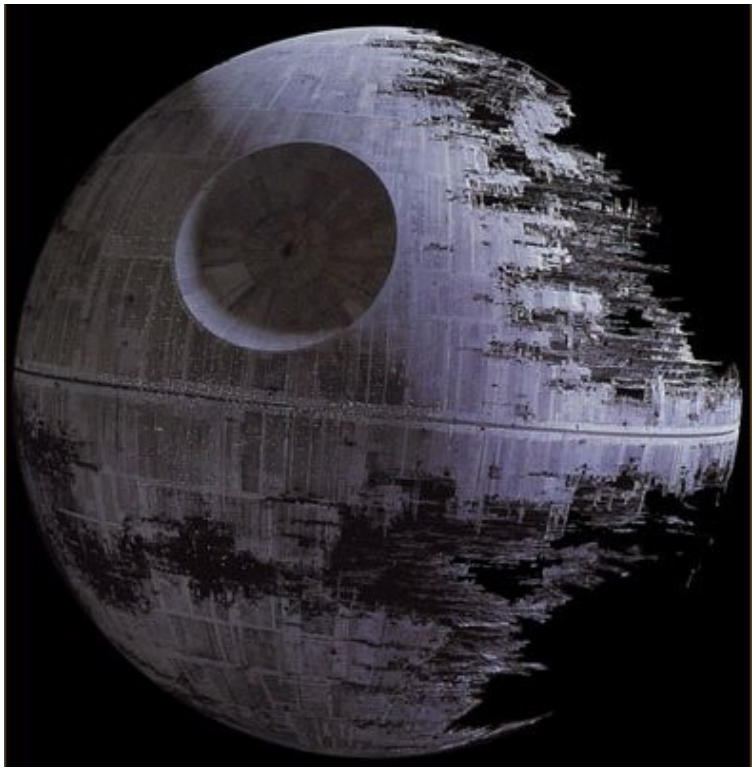
OpenStack



http://www.openstack.org

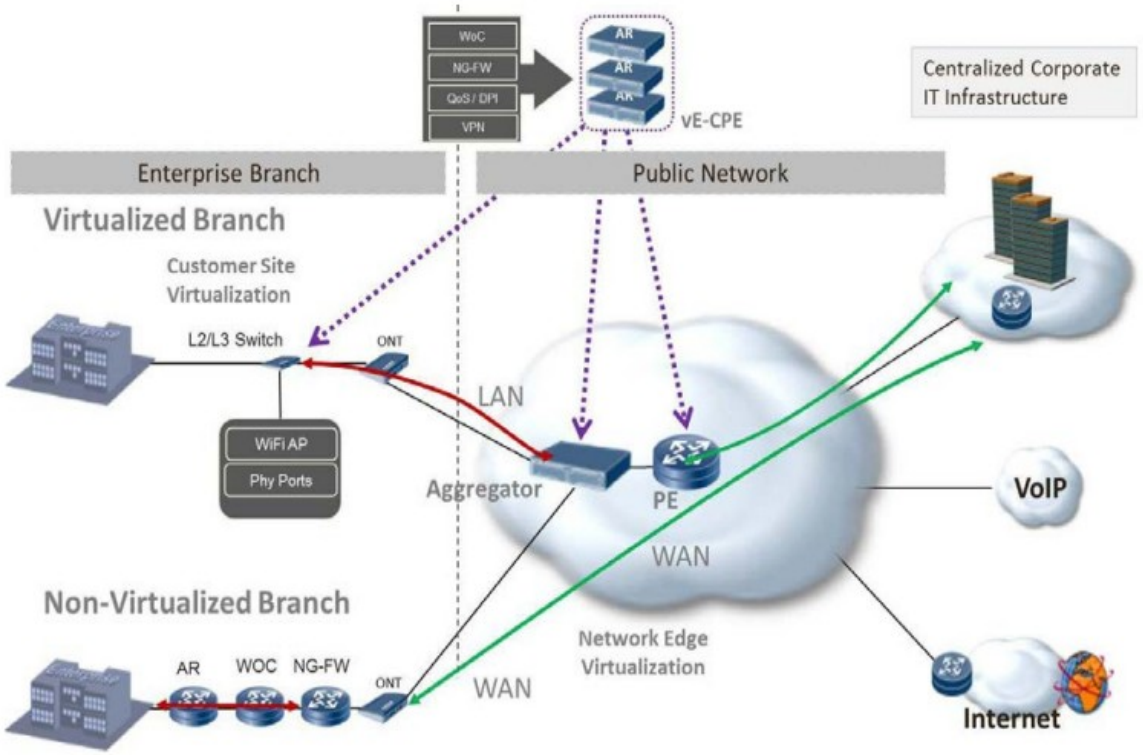
All done?

Not quite perfect...



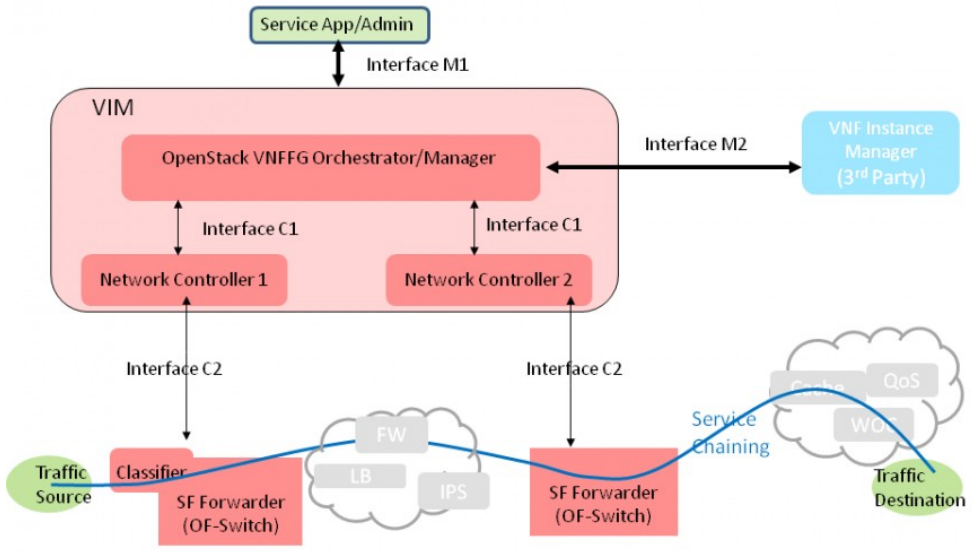
4. Filling the gaps

VNF as a Service

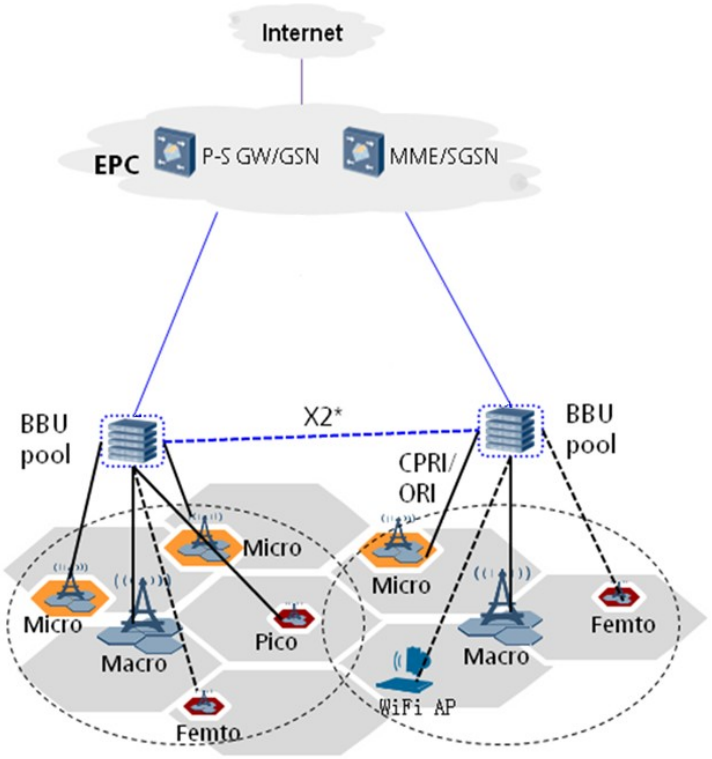


(ETSI #2)

Service Function Chaining



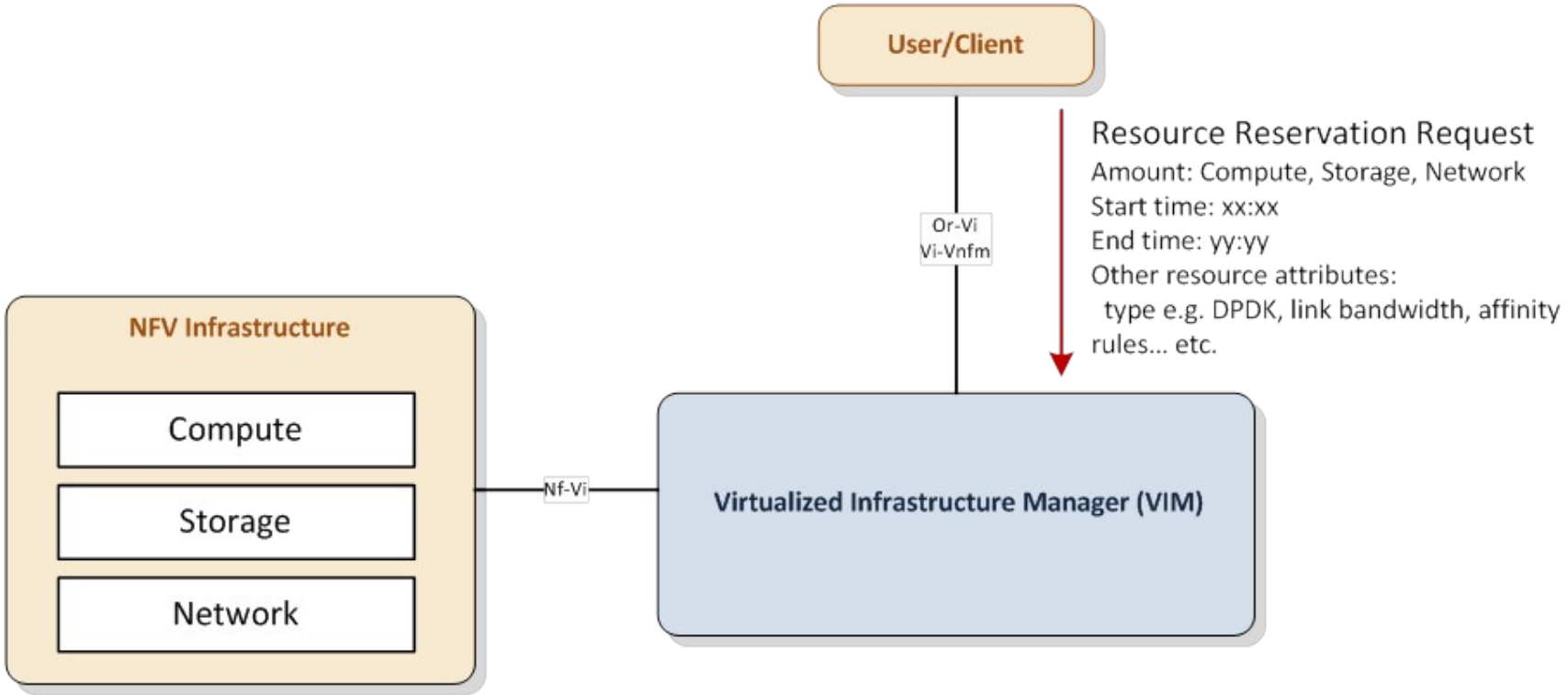
Virtualized Mobile Base Station



- Deterministic latency
- Accelerated dataplane performance
- Federation of multiple clouds
- High performance signal processing
- IPv6 support

(ETSI #4)

Resource reservation



Fault management

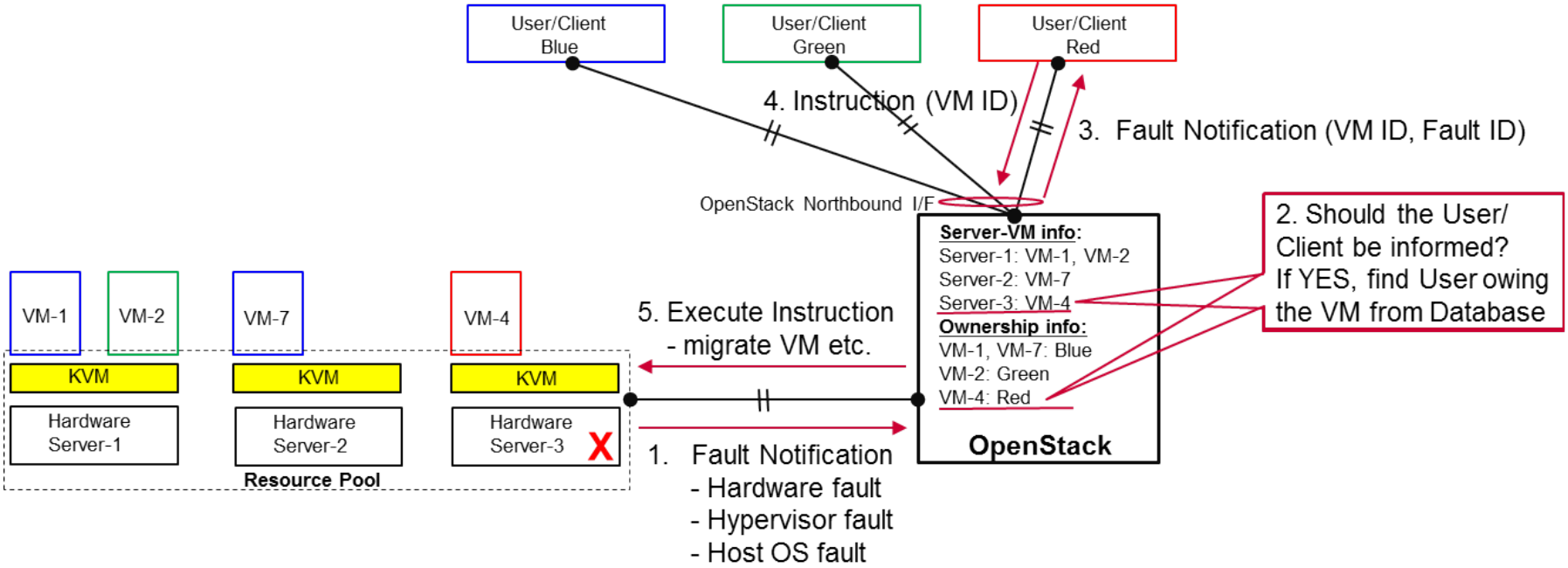


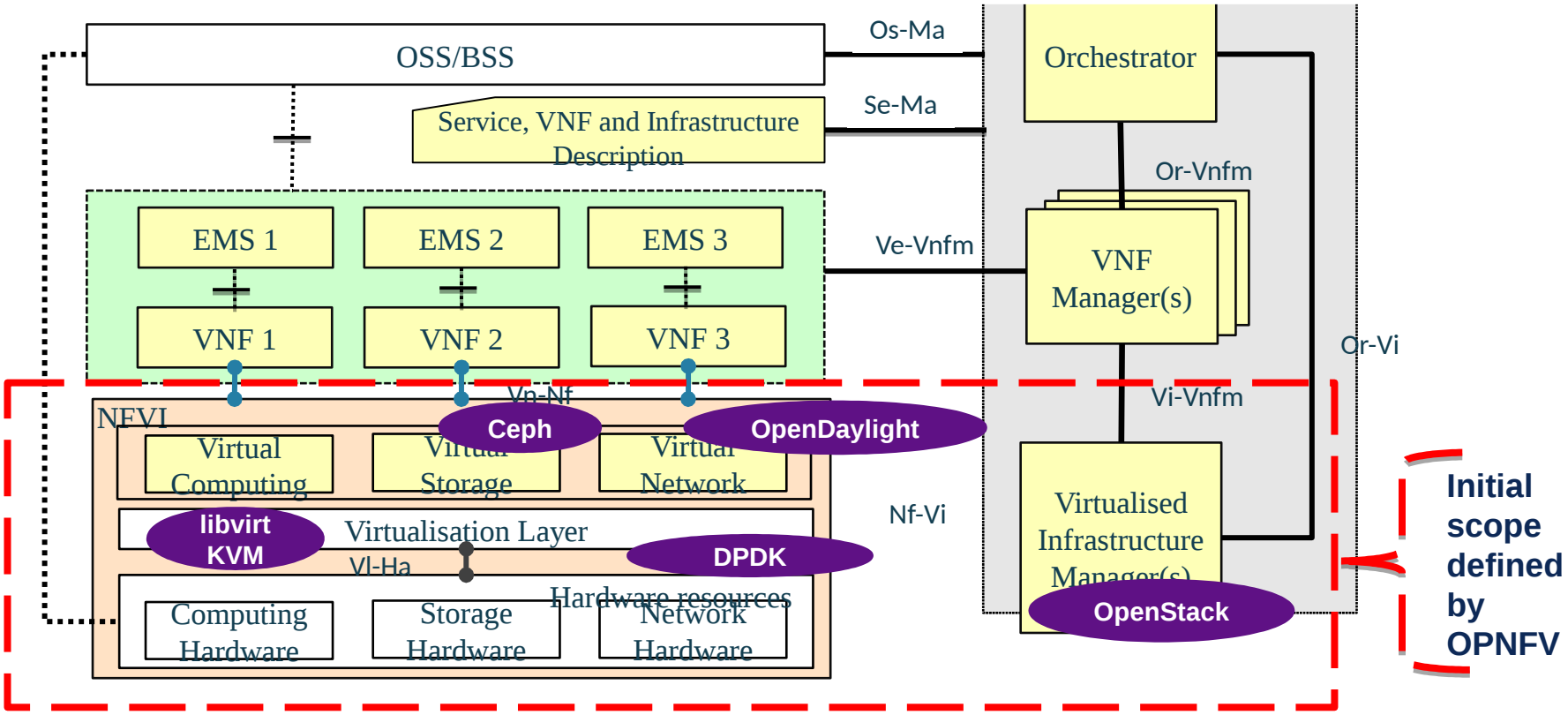
Fig. 1: Steps in Fault Management

Open source and NFV

http://opnfv.org

http://wiki.opnfv.org

OPNFV Project Scope



Broad industry support

Platinum Members

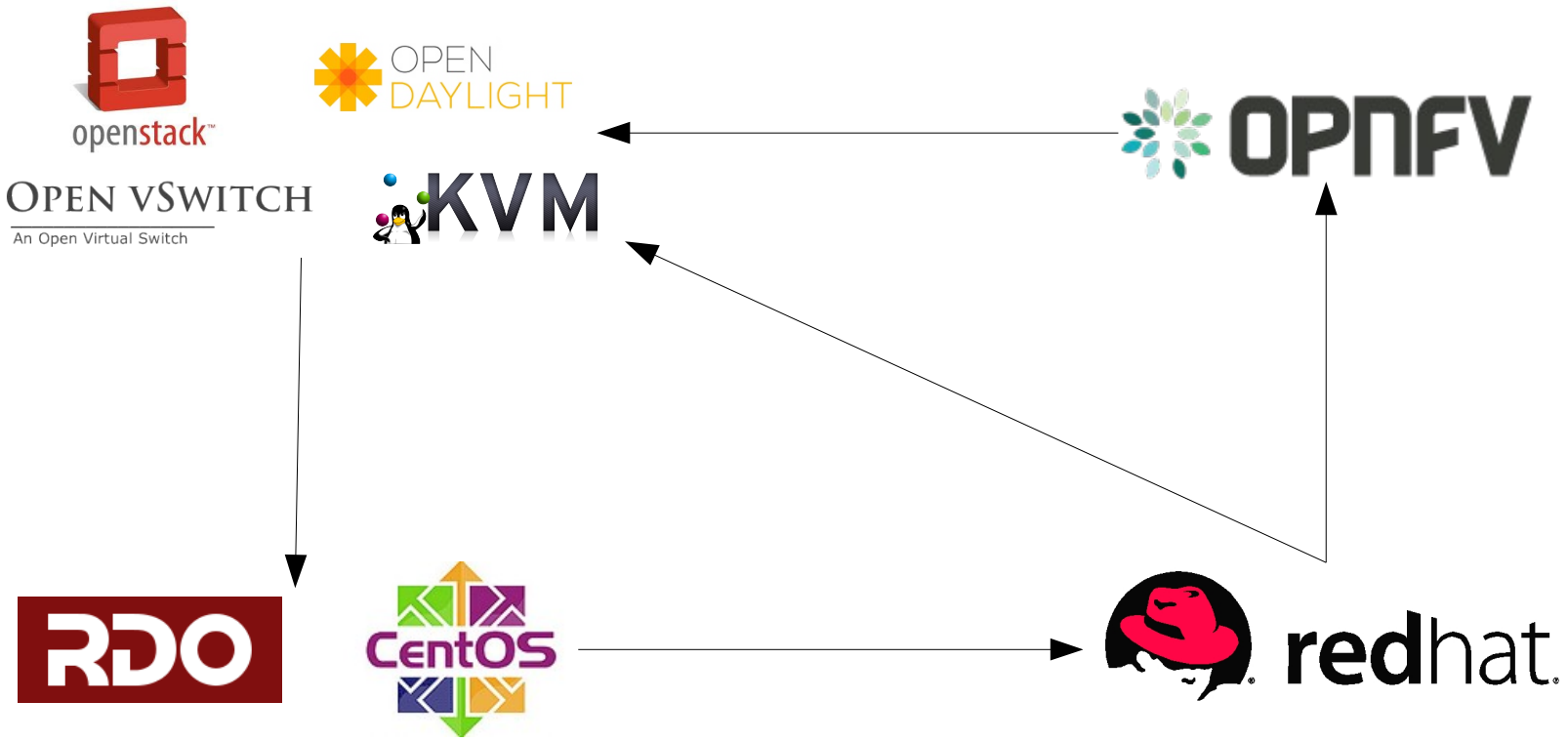
Silver Members

Upstream first

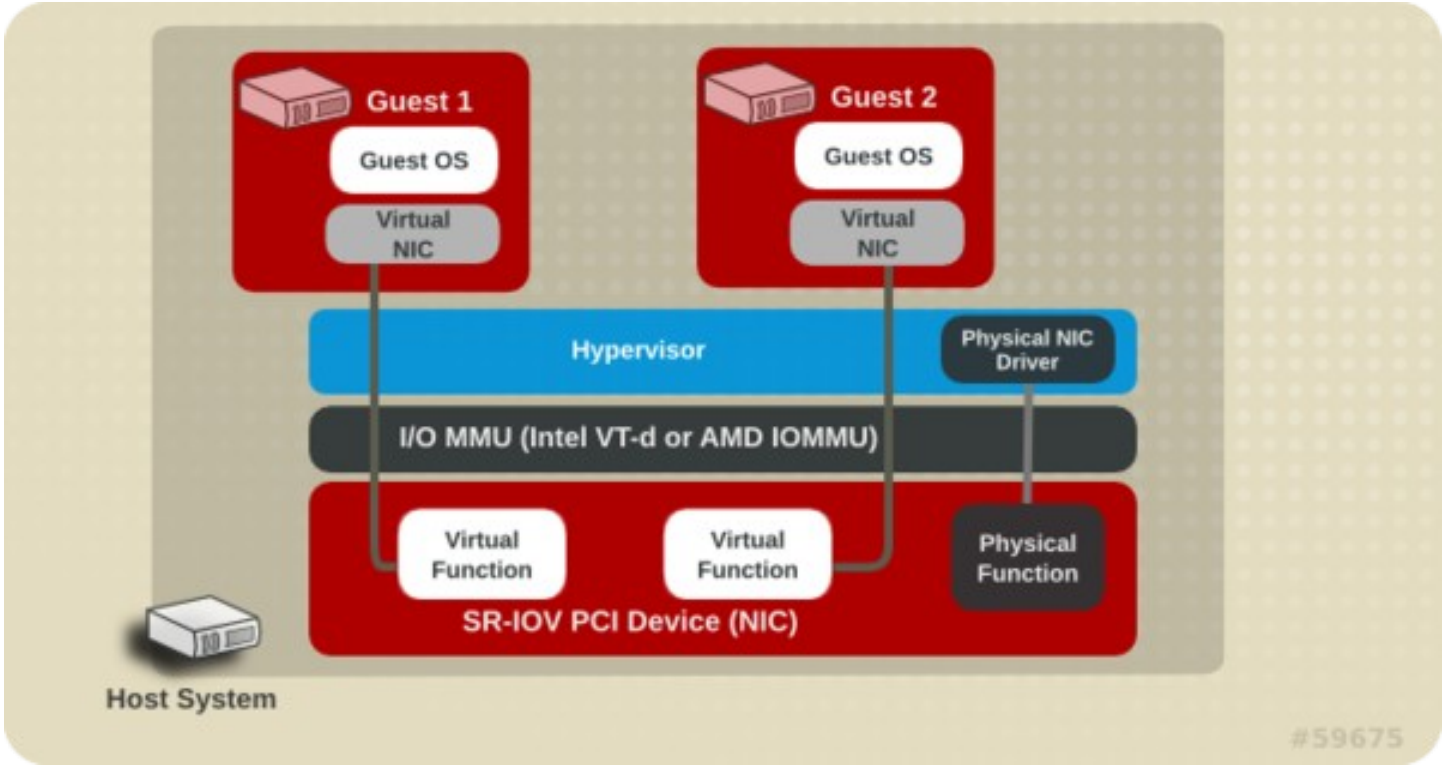
Fork-free zone

Red Hat and NFV

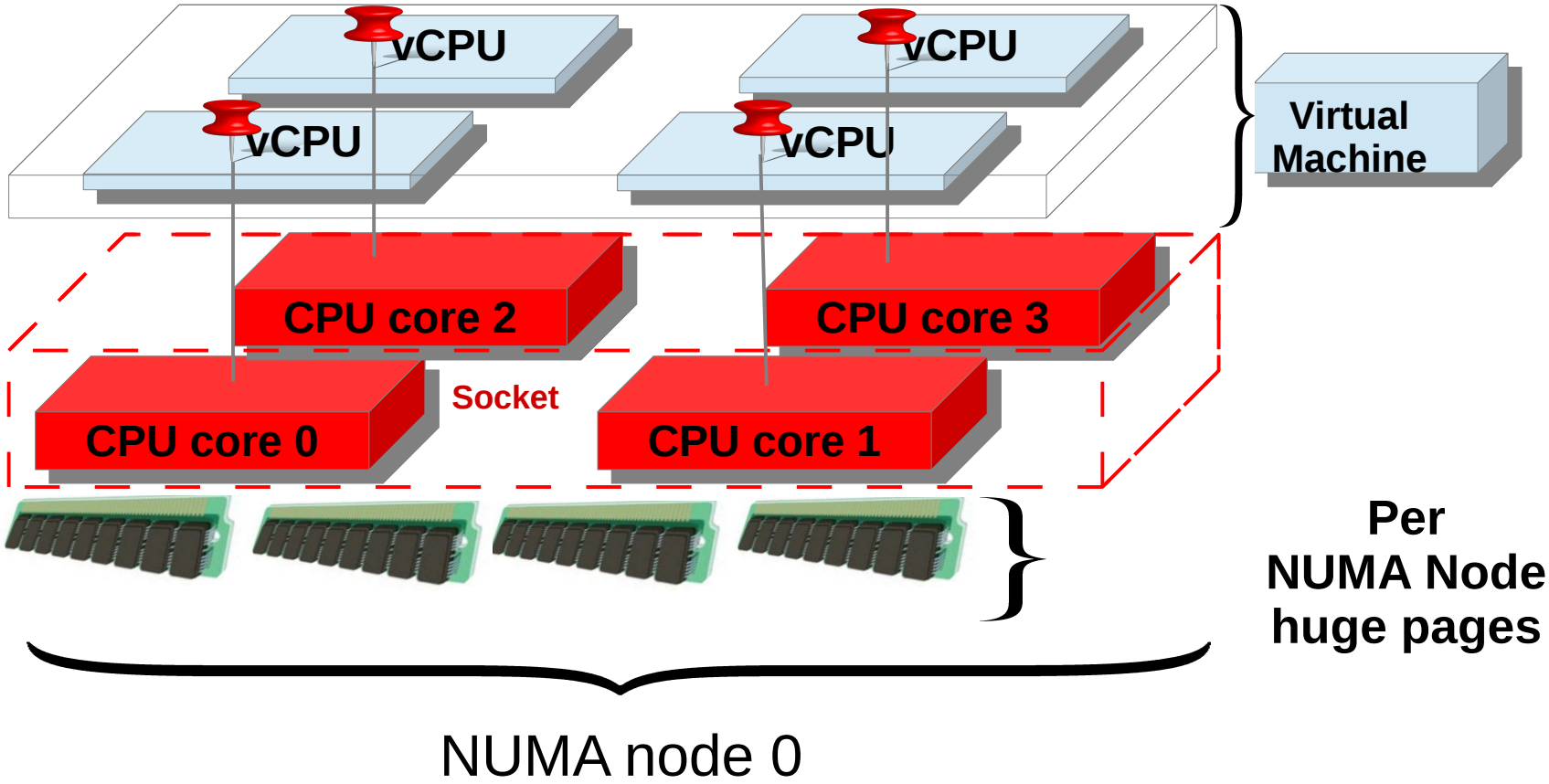
Getting the platform



Performance: SR-IOV support

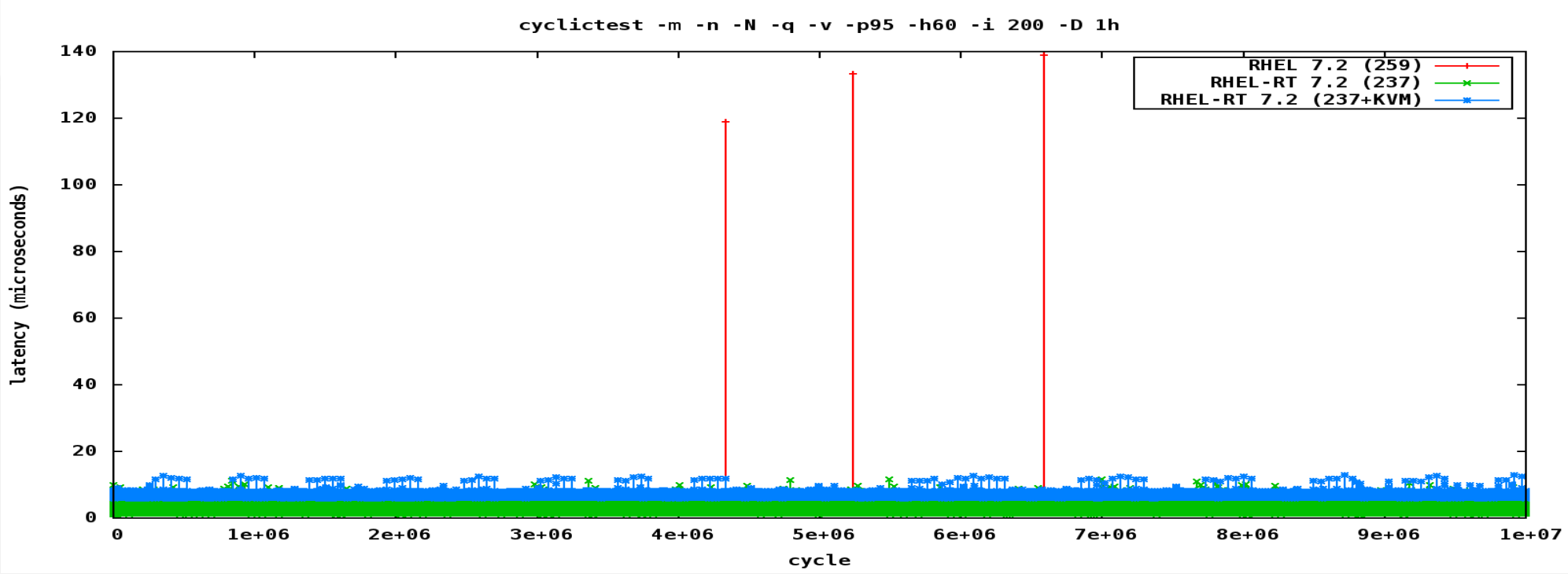


NUMA awareness

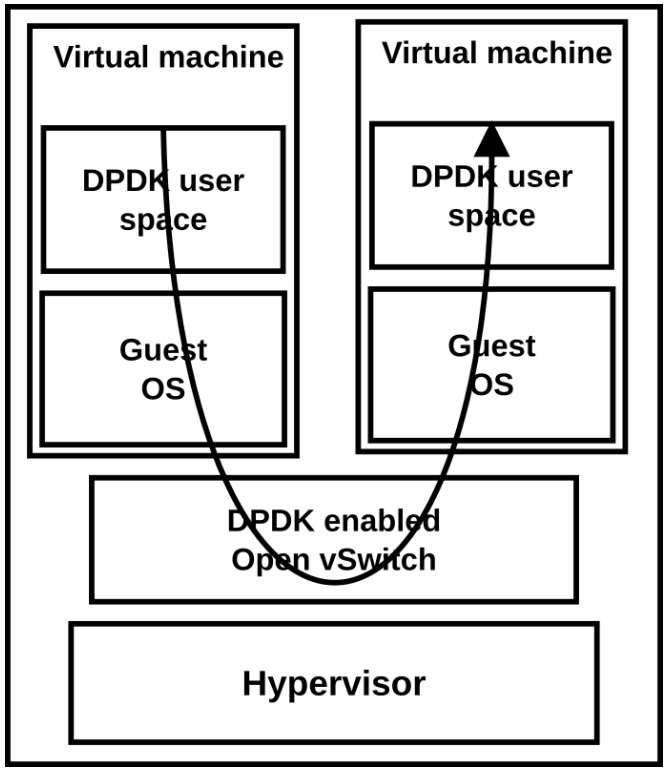


Real-time KVM

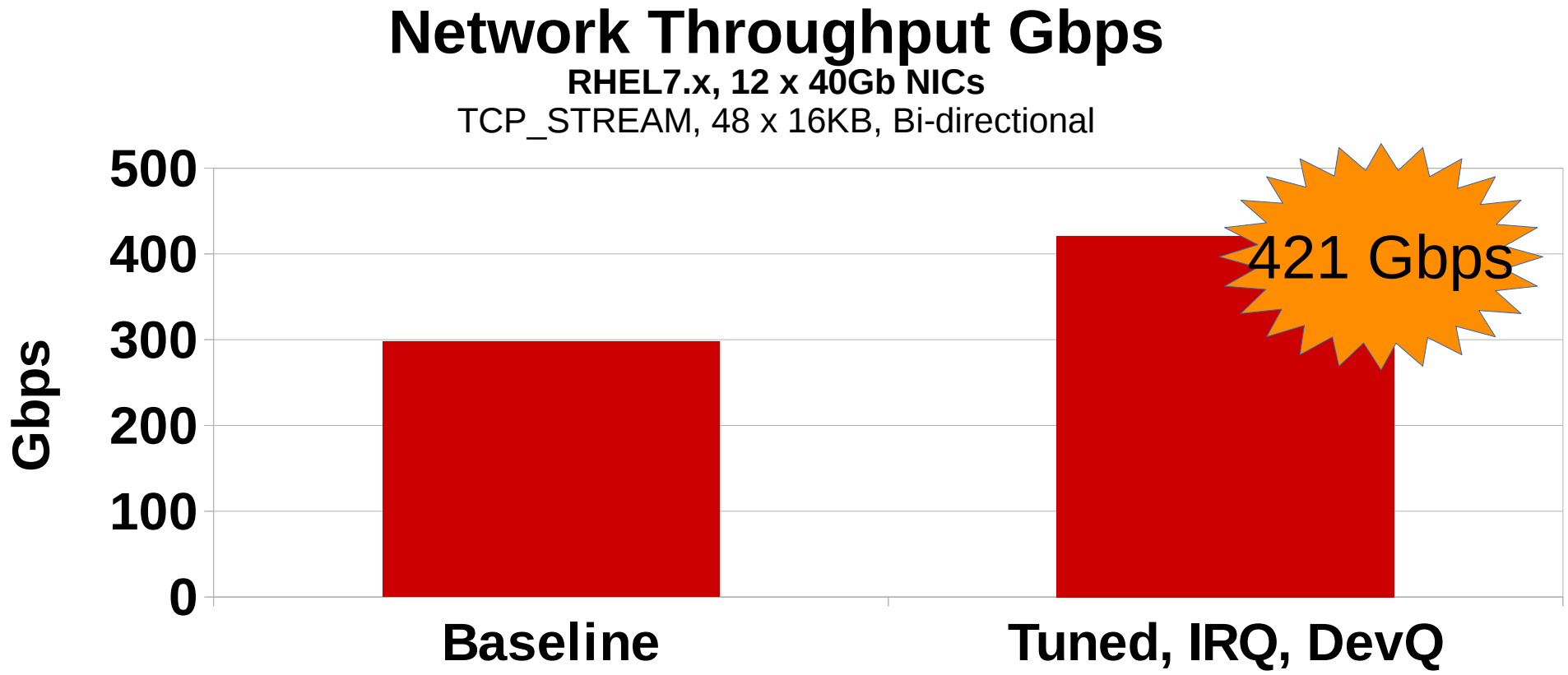
RHEL7.x Realtime Scheduler Latency Jitter Plot



DPDK accelerated OVS



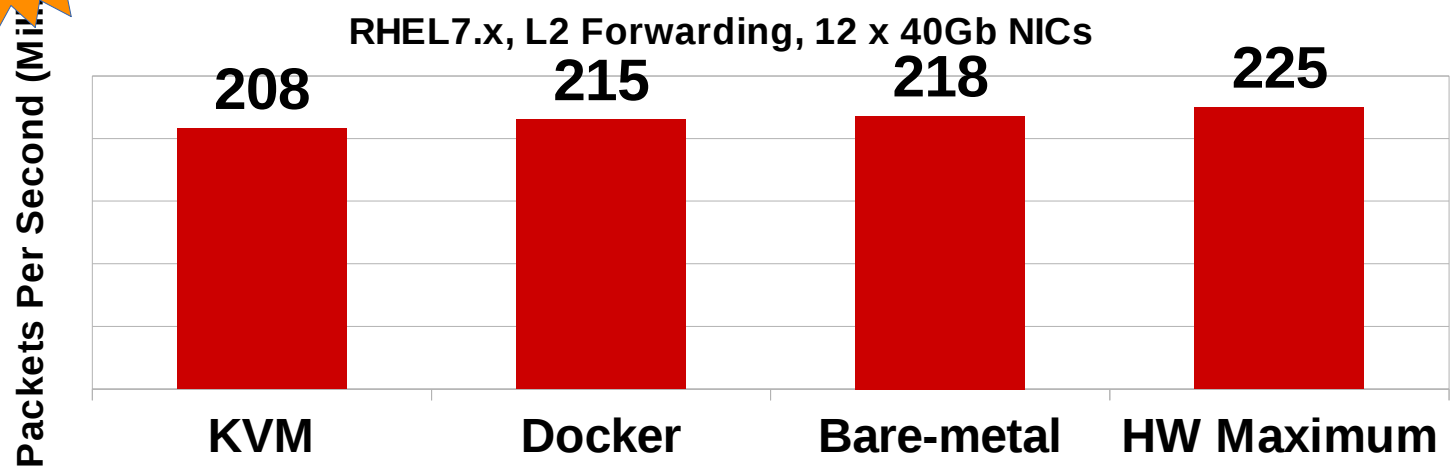
RHEL7 – 40G Network Data/Tuned (12 ports/host)



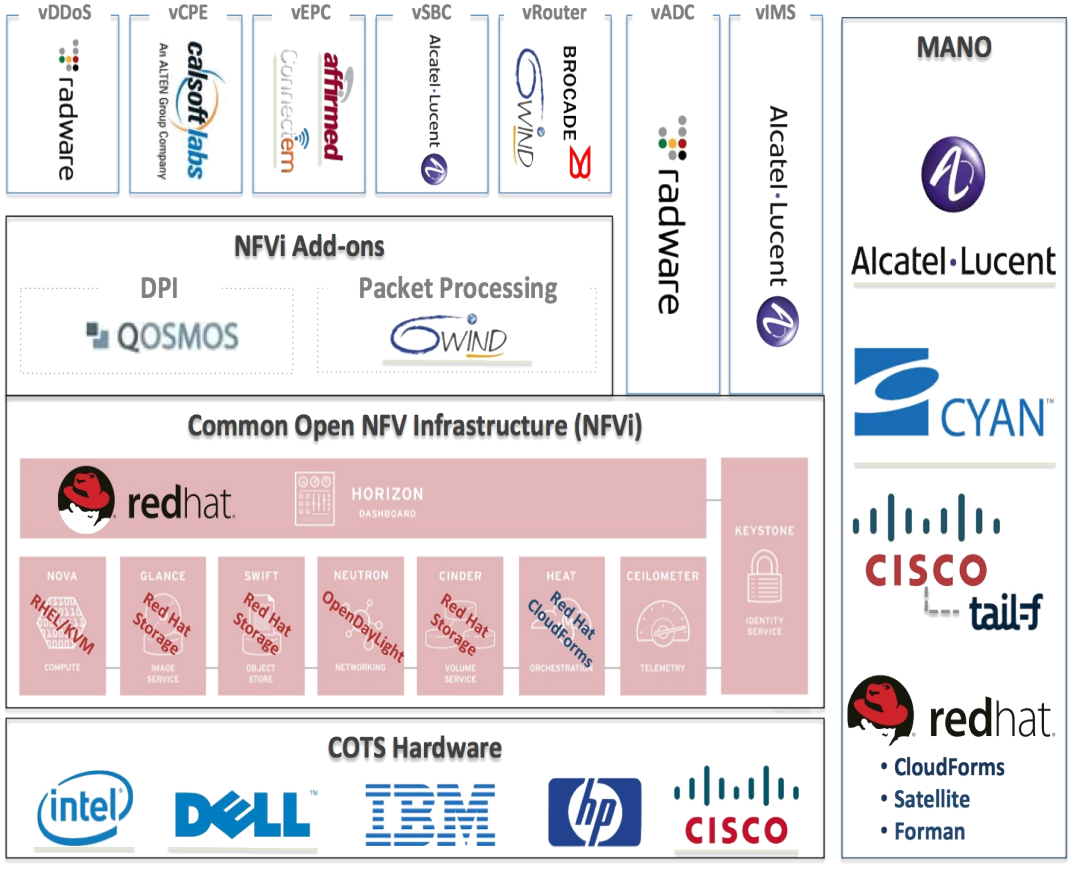
Network Functions Virtualization (NFV)

Throughput and Packets/sec @ 64 bytes (RHEL7.x+DPDK)

208Mpps+



Red Hat NFV Ecosystem

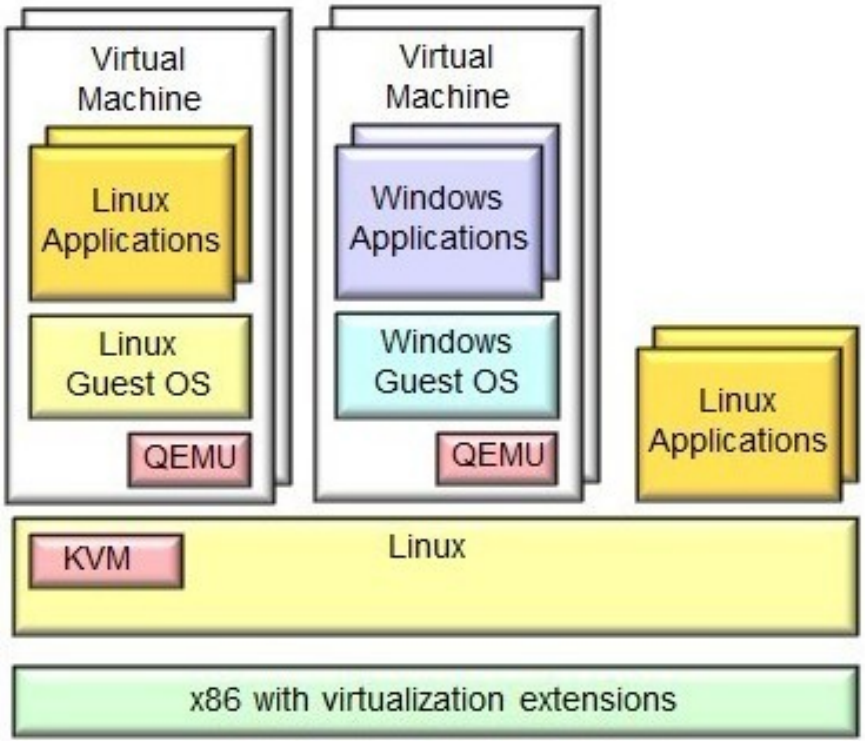


Thank you!

Bonus slides

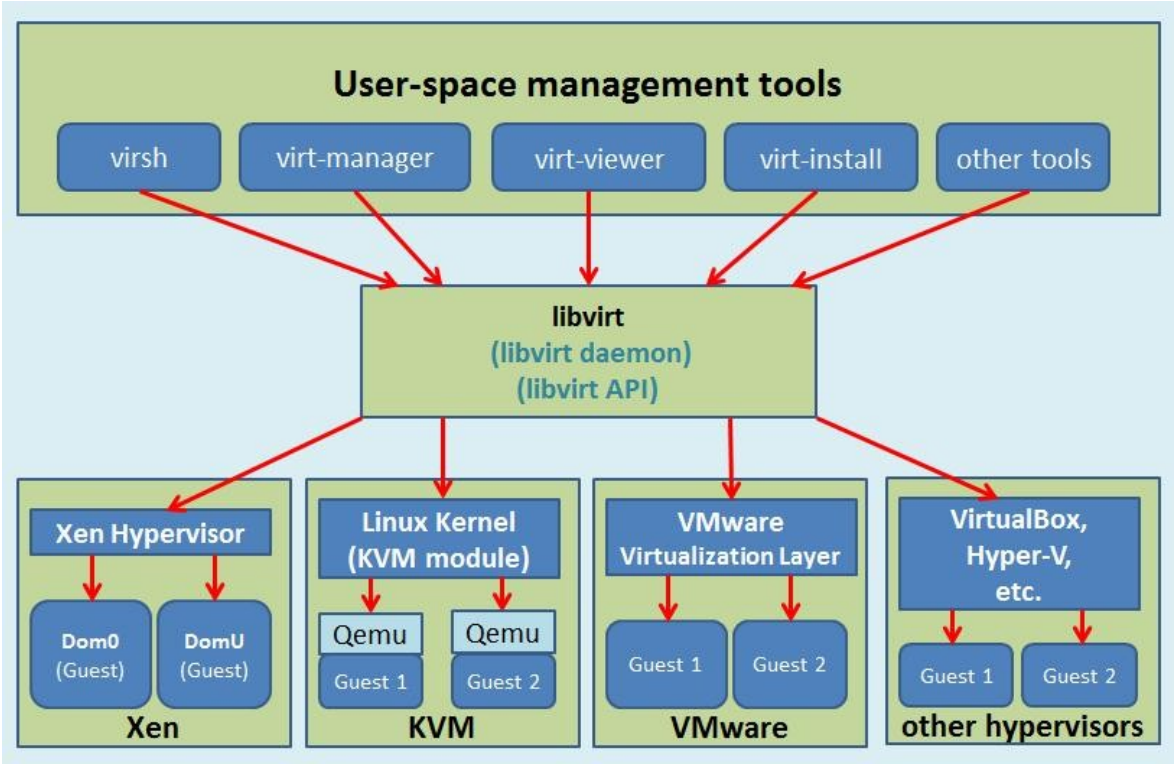
Project web sites

KVM



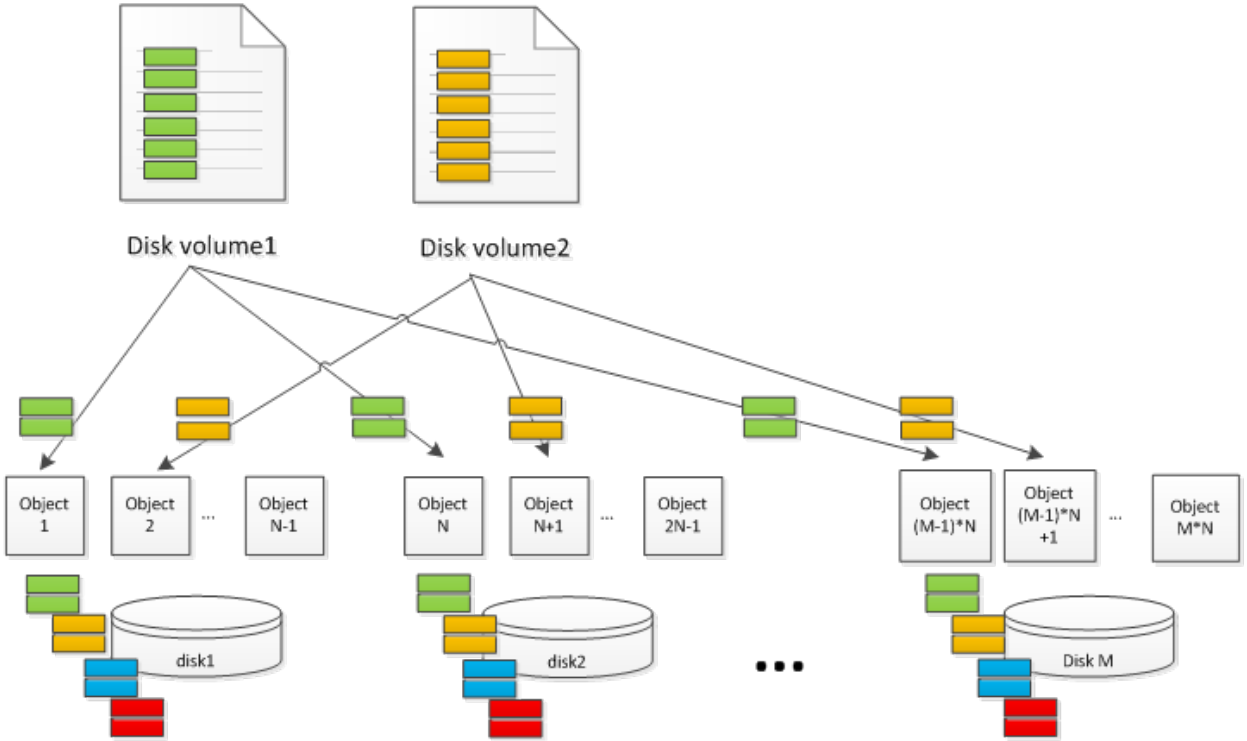
http://wiki.qemu.org

libvirt



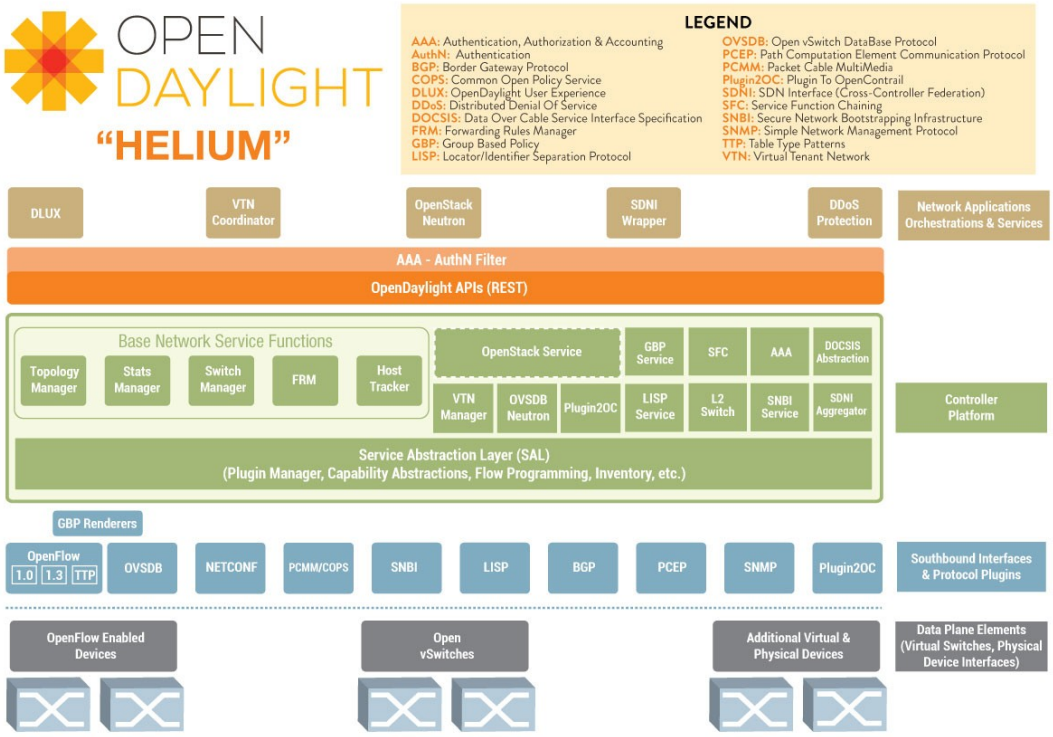
http://www.libvirt.org

Ceph



http://www.ceph.com

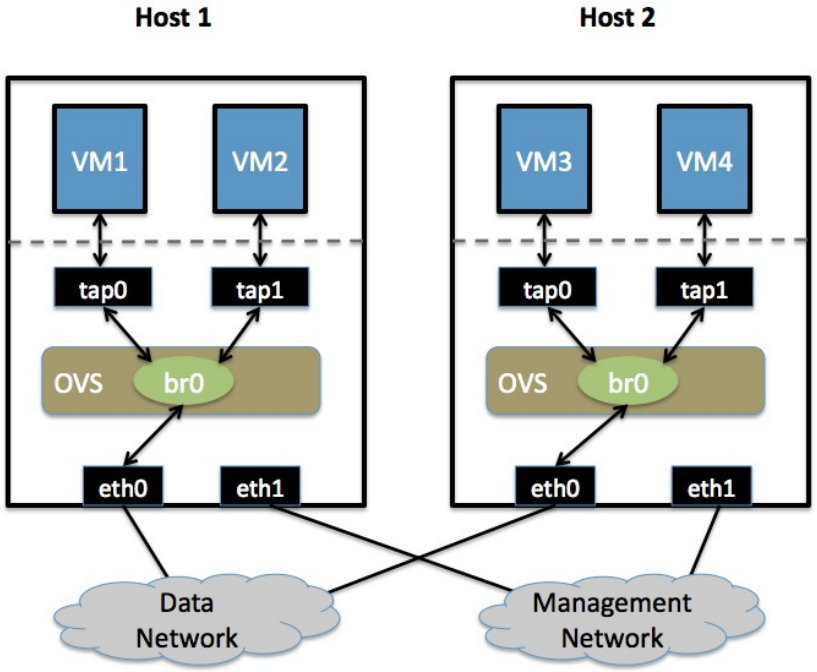
OpenDaylight



http://www.opendaylight.org

Open vSwitch

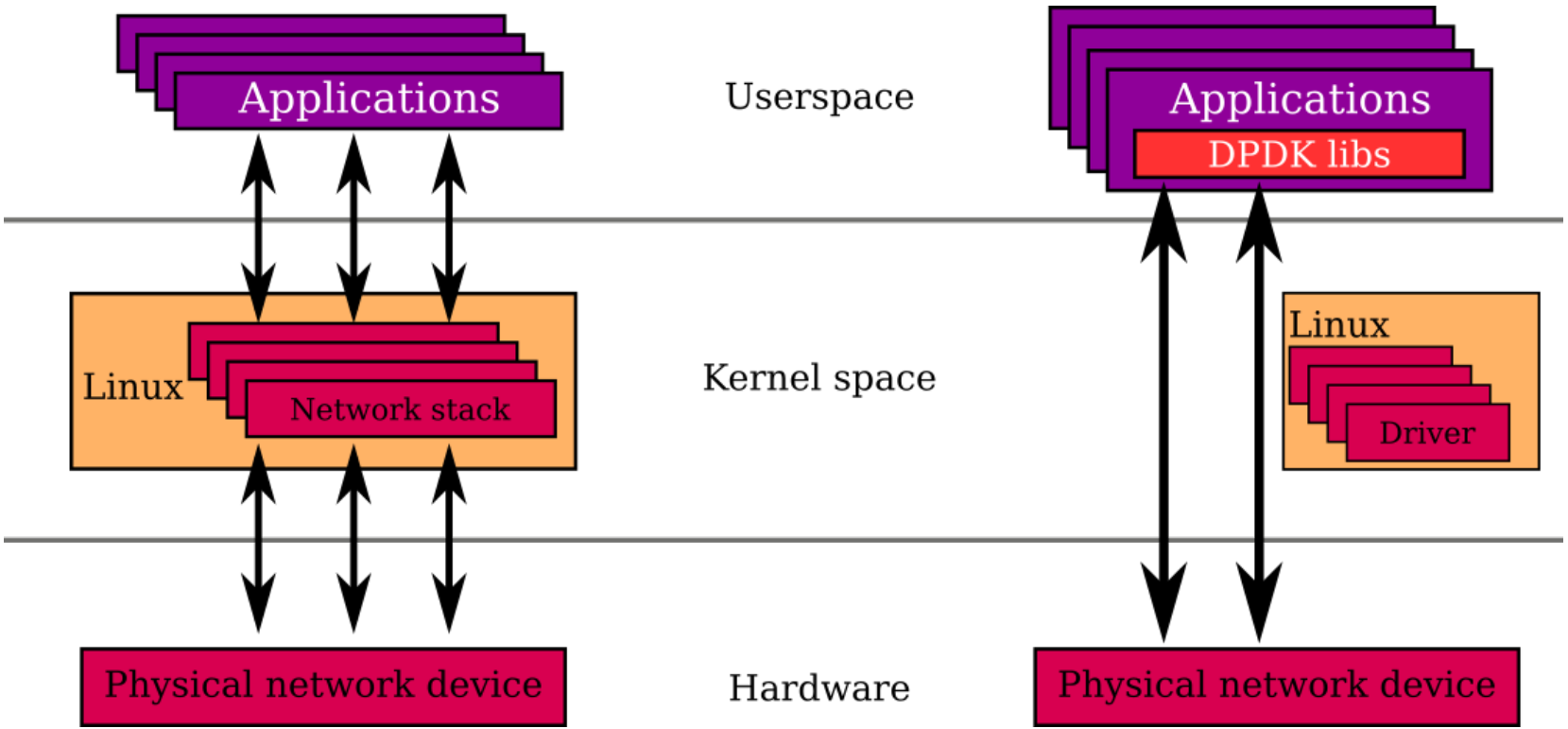
OPEN vSWITCH
An Open Virtual Switch



http://www.openvswitch.org

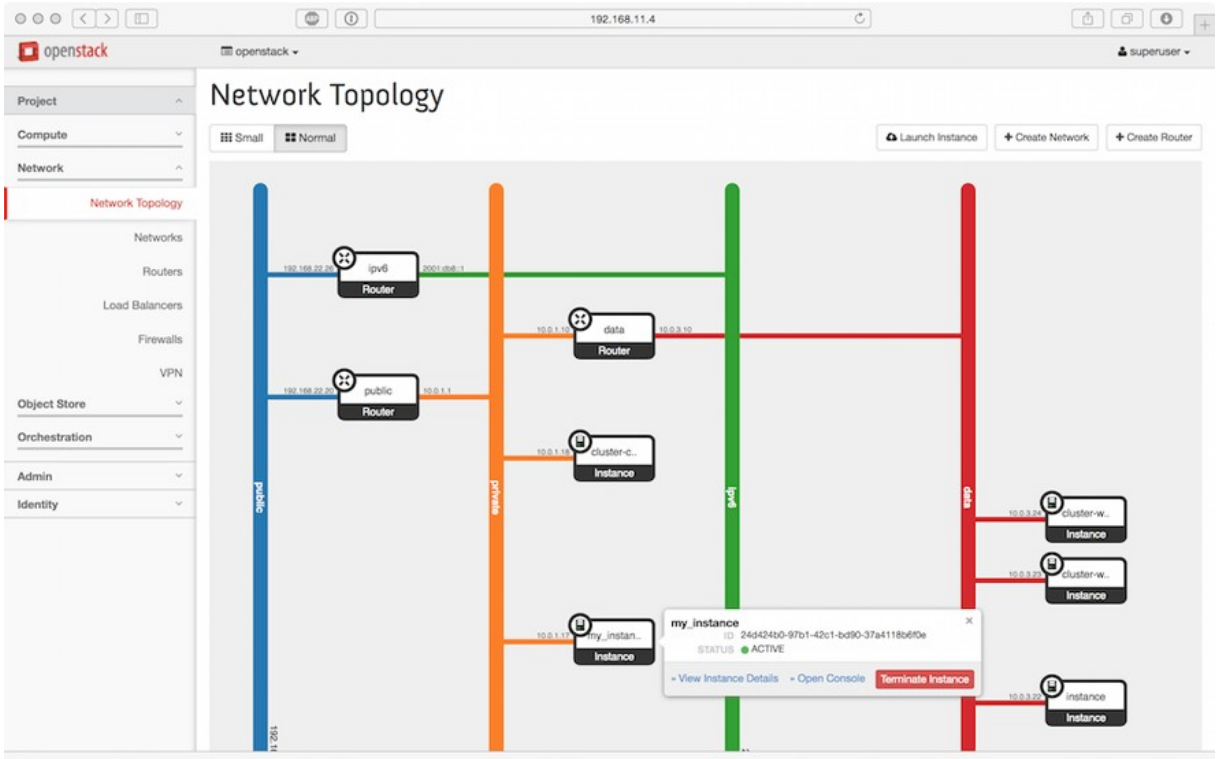
DPDK

DPDK



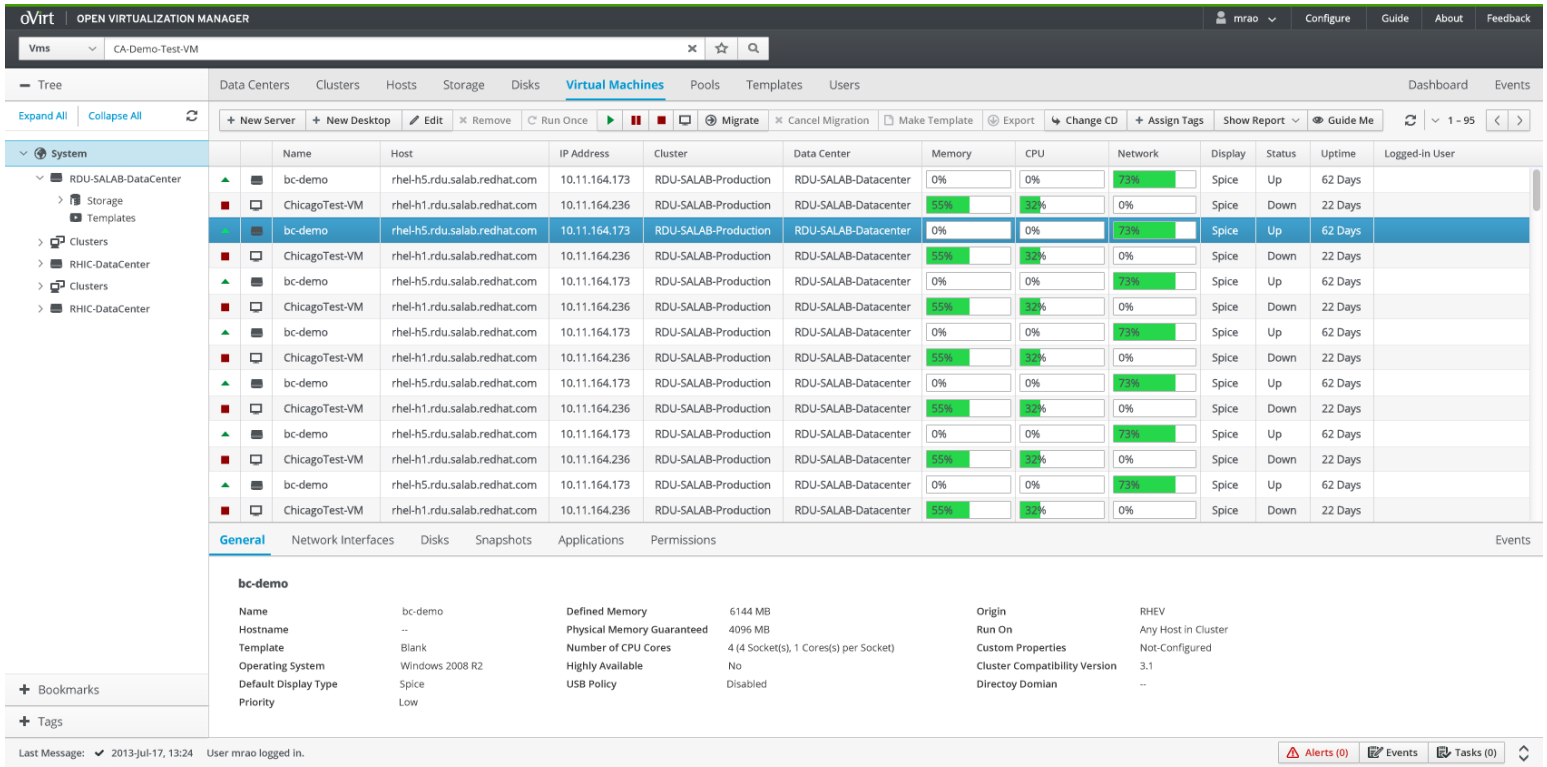
http://www.dpdk.org

OpenStack



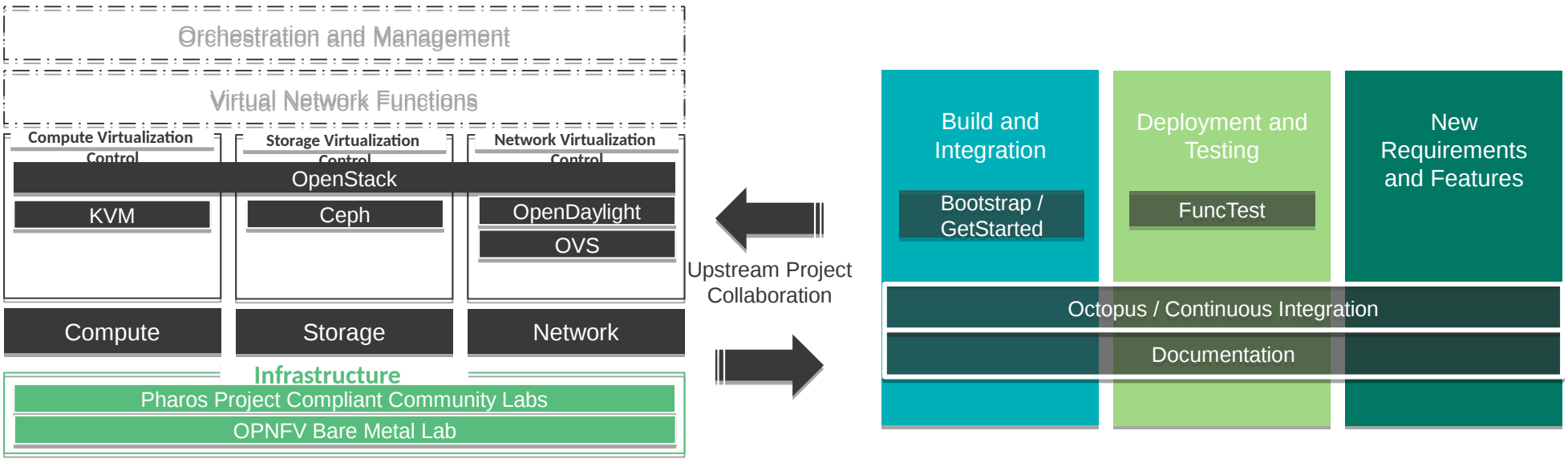
http://www.openstack.org

oVirt



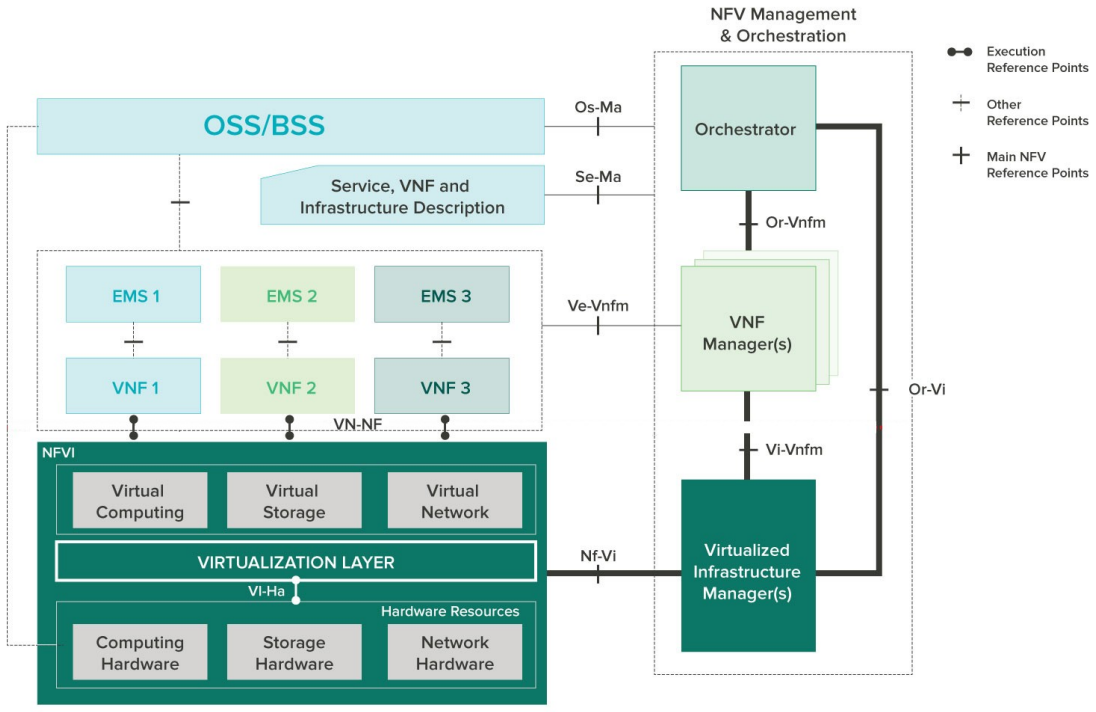
http://www.ovirt.org

OPNFV



http://www.opnfv.org

ETSI NFV ISG



http://www.etsi.org/technologies-clusters/technologies/nfv

SR-IOV certified hardware

Current supported and certified cards are listed at:
https://access.redhat.com/articles/1390483