



DPDK

DATA PLANE DEVELOPMENT KIT

Userspace 2015 | Dublin

Dynamic NFV Deployment with Port Hotplug and Virtio

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About me

- I am a software engineer at IGEL Co., Ltd.
- Roughly 10 years experience in embedded linux products.
- Currently, I am one of developers of Lagopus, an open source software switch.
 - <https://lagopus.github.io/>

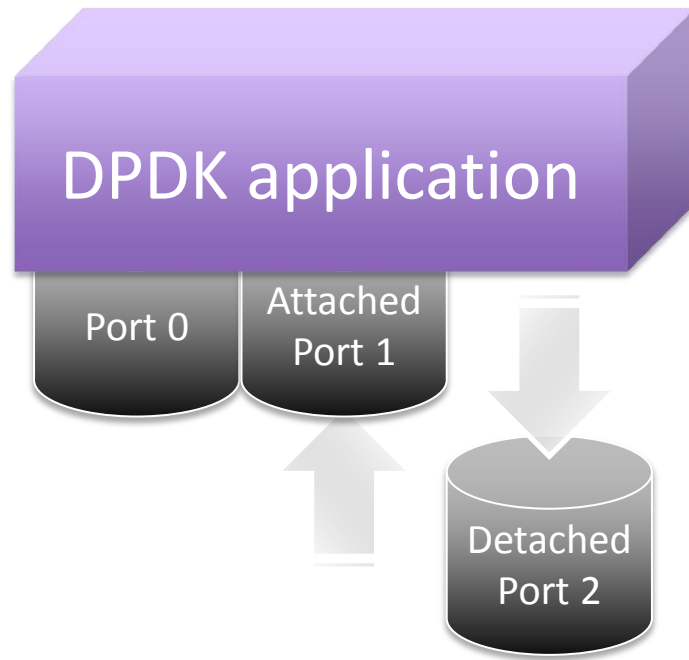
- Current Status of Port Hotplug
- Dynamic NFV Deployment with Port Hotplug and Virtio
 - Current limitations
 - What will be solved in DPDK-2.2/2.3?

DPDK

Current Status of Port Hotplug

What is Port Hotplug?

- After starting an application
 - attach to a port
 - detach from a port
- To support Port Hotplug, each PMD and EAL needs to be changed.



Supported OS and UIO module

- Linux
 - igb_uio
 - uio_pci_generic
 - ~~– VFIO~~
- BSD
 - nic_uio

No support for VFIO

Supported PMD

PMD	Supported version	Submitter of Port Hotplug
bond	2.1	Bernard Iremonger
ring	2.1	Bernard Iremonger
virtio	2.1	Bernard Iremonger
i40e	2.1	Bernard Iremonger
ixgbe	2.1	Bernard Iremonger
e1000	2.1	Bernard Iremonger
fm10k	2.1	Michael Qiu
null	2.0	Tetsuya Mukawa
pcap	2.0	Tetsuya Mukawa

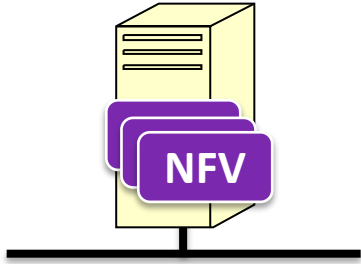
Thanks for hard
working of Bernard
and Michael.

Not Supported PMD

- Below PMDs
 - af_packet
 - mlx4
 - xenvirt
 - bnx2x
 - cxgbe
 - mpipe

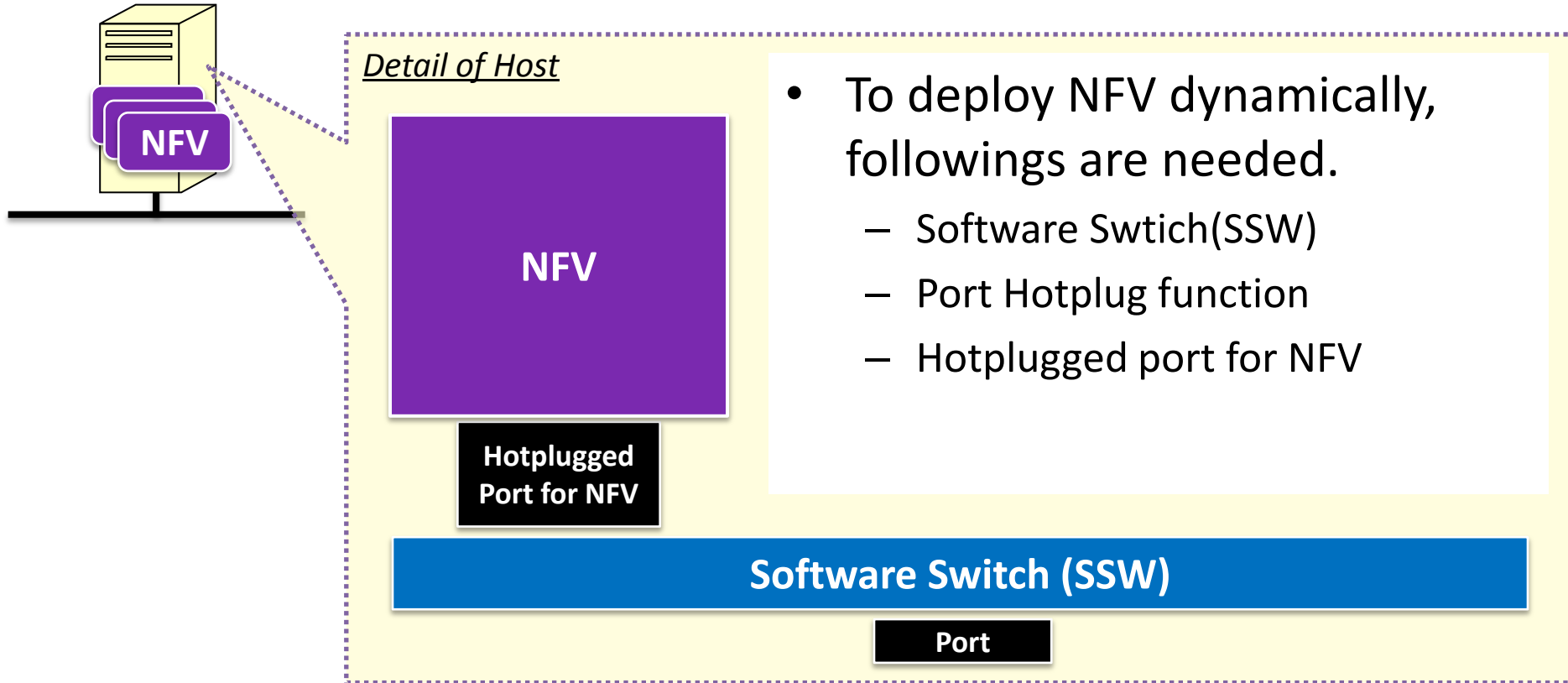
DPDK

Dynamic NFV Deployment with Port
Hotplug and Virtio

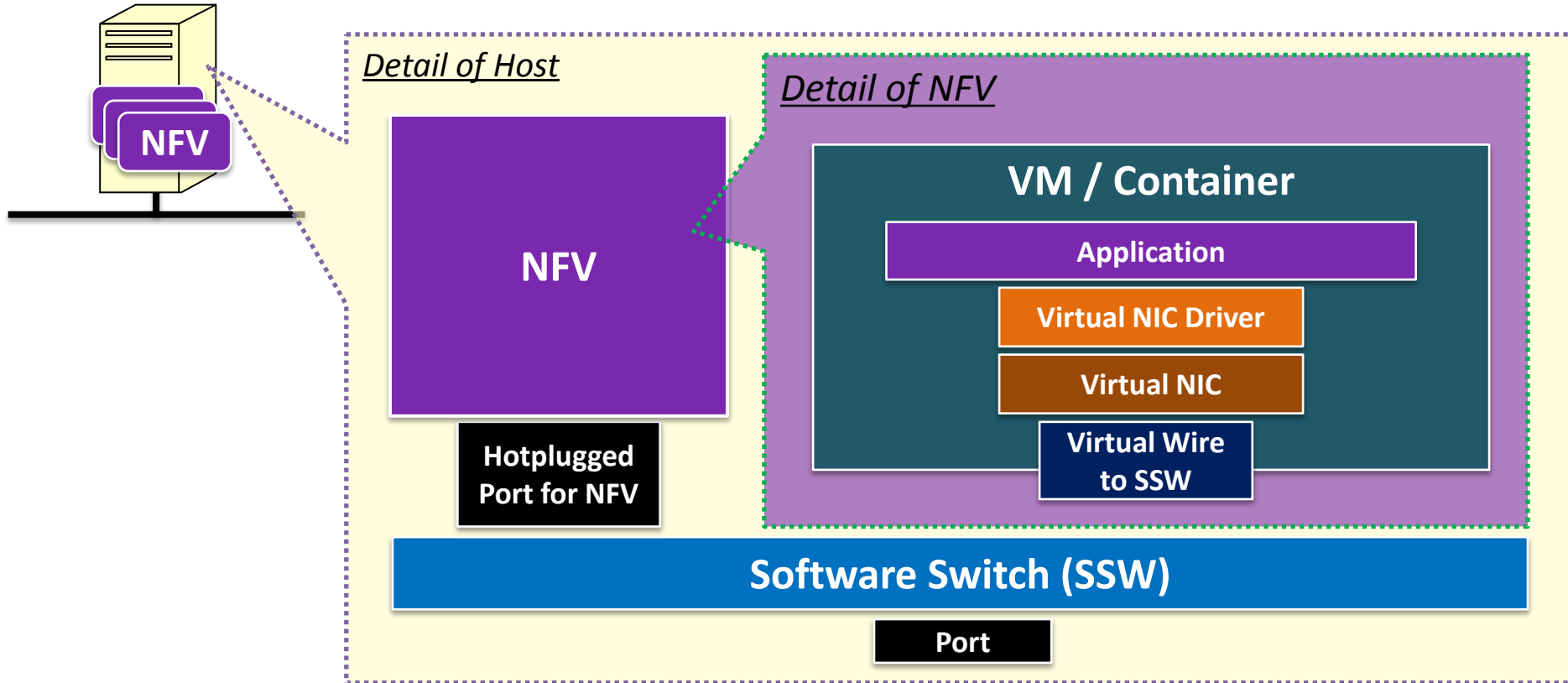


- In some cases, NFV is needed to be deployed on demand.

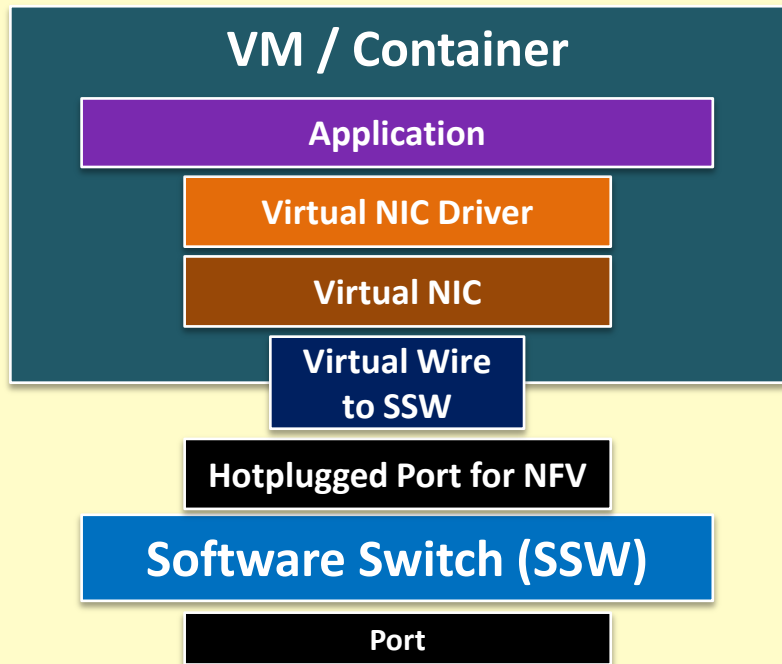
Block Diagram of Host



Block Diagram of NFV

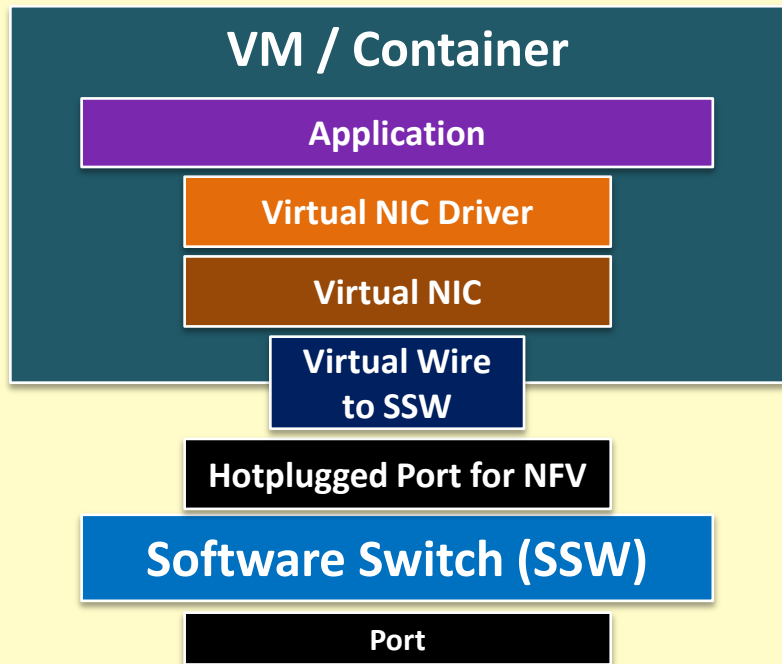


Component description



Component	Description
VM / Container	Isolation to separate NFV and Software switch
Application	NFV application
Virtual NIC Driver	Device driver for virtual NIC
Virtual NIC	Virtual NIC device to connect to SSW
Virtual Wire to SSW	Connection between Virtual NIC and SSW
Hotplugged Port for NFV	Abstraction for SSW to treat NFV connection as normal port
Software Switch	Packet distributor

Which legacy implementations can be used?



Feature	Available implementation
VM / Container	QEMU/KVM(*1)
Virtual NIC Driver	virtio-net PMD
Virtual NIC	virtio-net
Virtual Wire to SSW	vhost-user / vhost-cuse
Hotplugged Port for NFV	Port Hotplug API(*2) librte_vhost
Software Switch	Lagopus / dpdk-ovs / etc...

(*1) No support for container.

(*2) There is no PMD for this purpose.

Current limitations

- No PMD for NFV connected port.
- No Support for container like docker.
- Denial of reconnection.
 - Currently, when SSW is killed or stopped, then restarted, NFV cannot connect to SSW.
To connect again, NFV also needs to be restarted.

What will be solved in DPDK-2.2/2.3?

- “vhost PMD” for NFV connected port.
 - The PMD will support Port Hotplug.
- Container support.
 - Virtio and vhost will be used.
 - All containers will be supported.

- So far, we have a few issues.
 1. No PMD for NFV connected port.
 2. No container support.
 3. Denial of reconnection.
- Hopefully “1” and “2” will be solved in half year.
- But still “3” will be left.

Thanks