Data Plane Device Management Library (DPDM)

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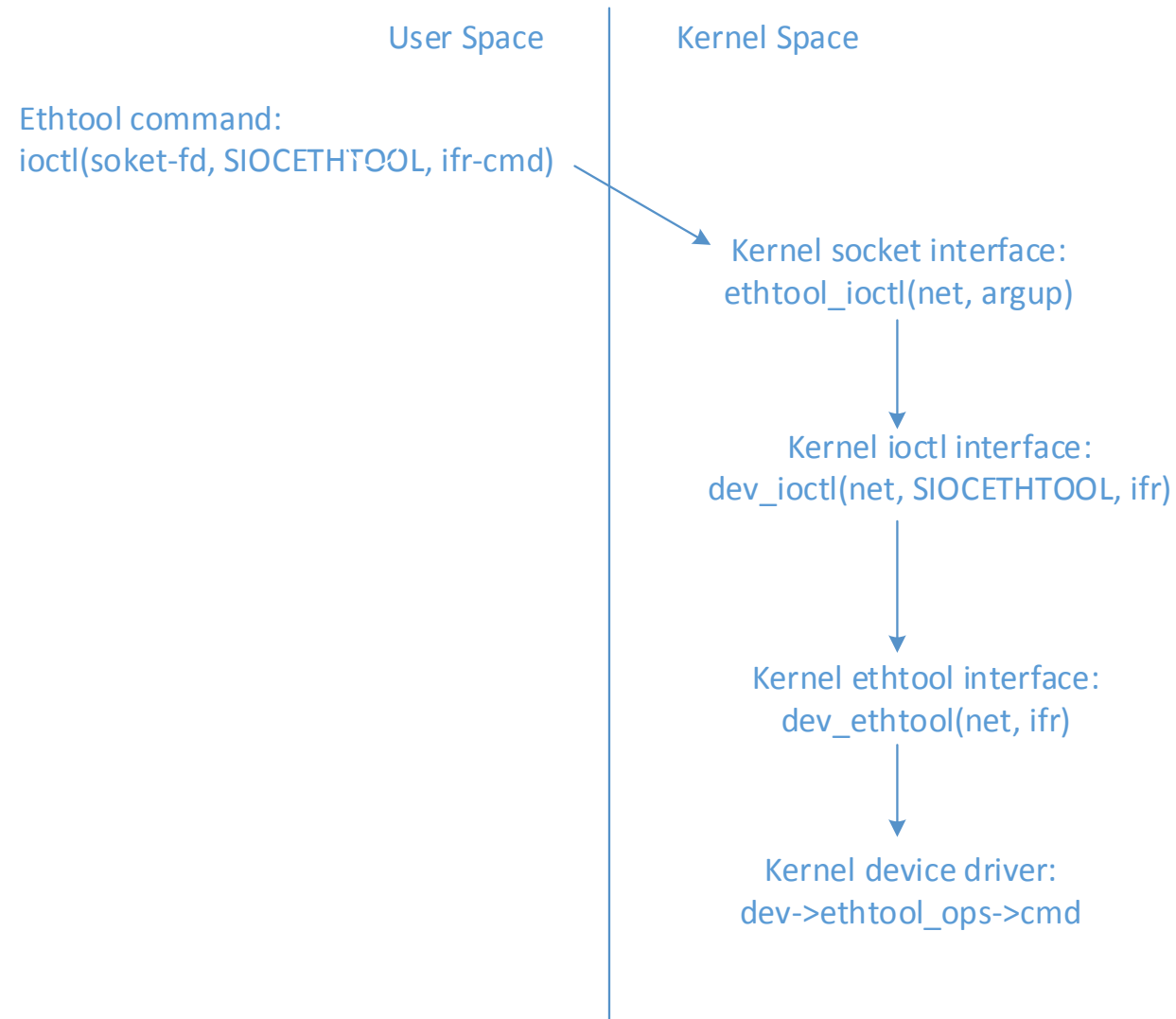
Legal Disclaimer

DPDM

▶ DPDM includes a set of user-space libraries and a kernel module.

▶ DPDM user-space libraries are data plane device management libraries designed and implemented based upon Intel-initiated Open Source project DPDK.

▶ DPDM is based upon a driver extension technology that enables DPDM to support additional device management functionalities that are not in the scope of DPDK.

▶ DPDM includes components to support both user-space and kernel-space device management interfaces. This has become critical for Telco* applications since more customers are requesting features to support managing devices over Network Functions Virtualization (NFV) and cloud environment.

▶ With DPDM, customers either can write a user-space daemon to invoke supported device features through Inter-Process Communications (IPC) or use existing network device management utilities (Ethool/IP/Ifconfig) to manage network device setup when devices are managed by DPDK driver.

Ethtool and Kernel Driver

DPDK

User Space | Kernel Space

Ethtool command:
ioctl(soket-fd, SIOCETHTOOL, ifr-cmd)

Kernel socket interface:
ethtool_ioctl(net, argup)

Kernel ioctl interface:
dev_ioctl(net, SIOCETHTOOL, ifr)

Kernel ethtool interface:
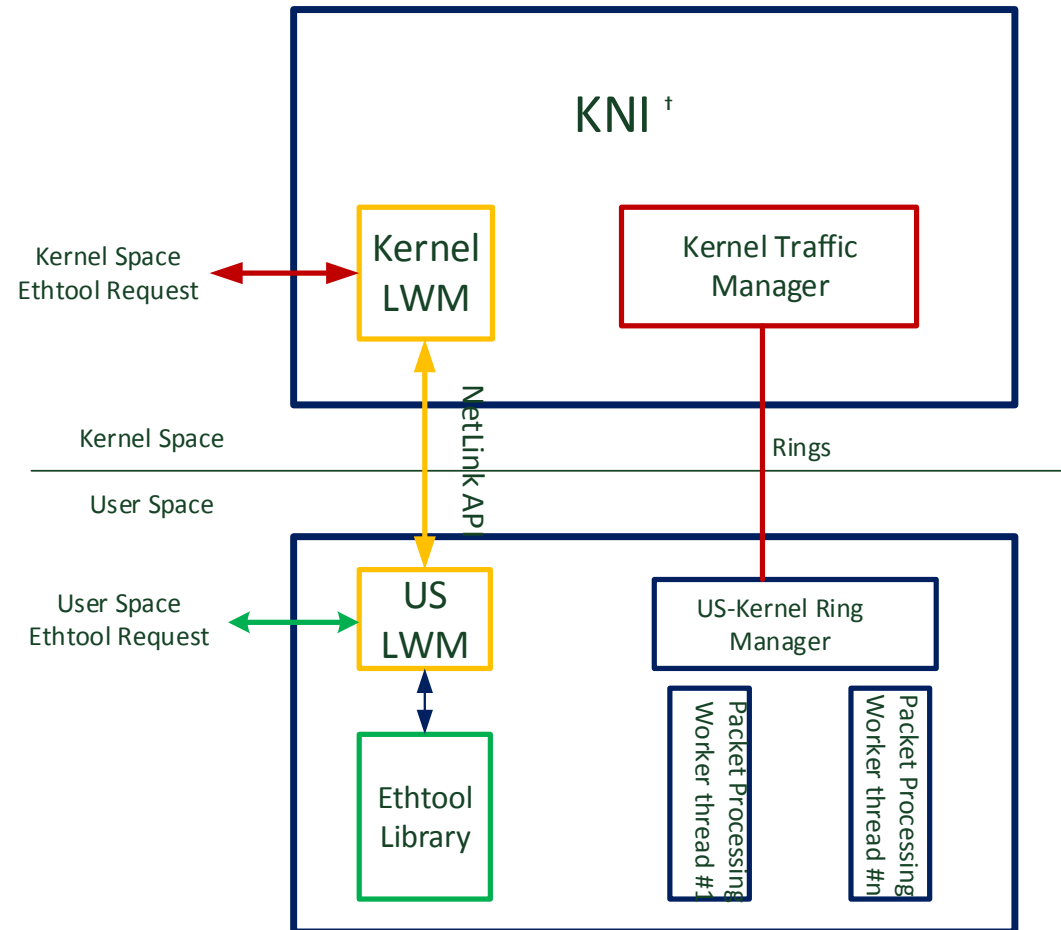dev_ethtool(net, ifr)

Kernel device driver:
dev->ethtool_ops->cmd
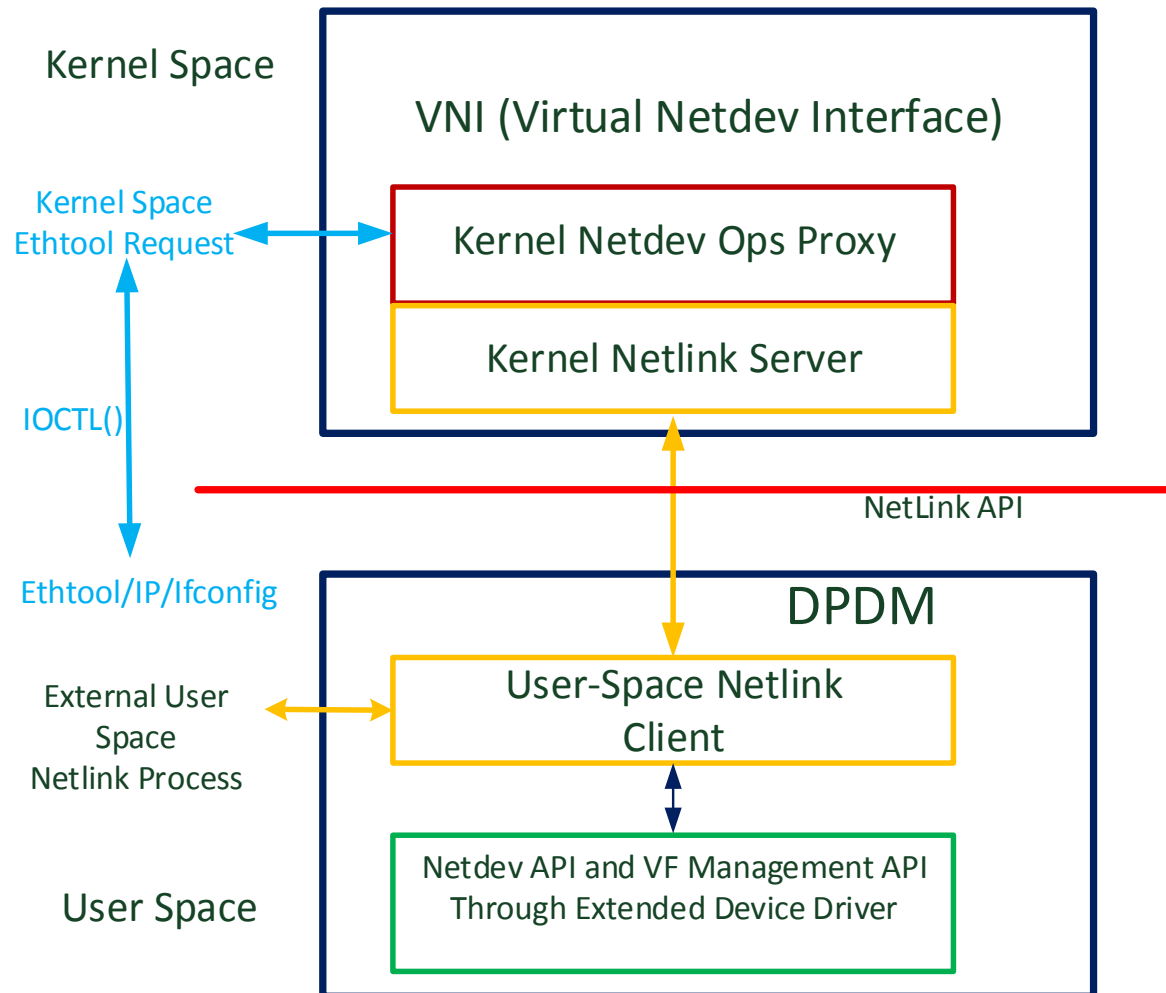
DPDK Ethtool Upstream Effort

Hybrid Ethtool Library Implementation Model

KNI [†]: remove kernel-space ethtool library and add Kernel LWM

DPDM

User Space Data Plane Device Management Architecture

DPDK Driver Extension

- ▶ Extended Driver Registered Through GCC Constructor
  - ▶ Register extender driver before main entry
  - ▶ Link extended driver with base driver after rte_eal_init()
- ▶ Extended Device Structure
  - ▶ struct rte_eth_dev_ex::dev_ethtool_ops, ::dev_netdev_ops
  - ▶ ::netdev_data, ::vf_flags, ::vf_mask, ::is_vf
- ▶ Run Time Driver Connection
  - ▶ rte_dev_probe_extension(...)
- ▶ ETH_DEV API Extension
  - ▶ rte_ethtool_x and rte_netdev_x
  - ▶ rte_eth_get_devs_by_port(...)

Questions?

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