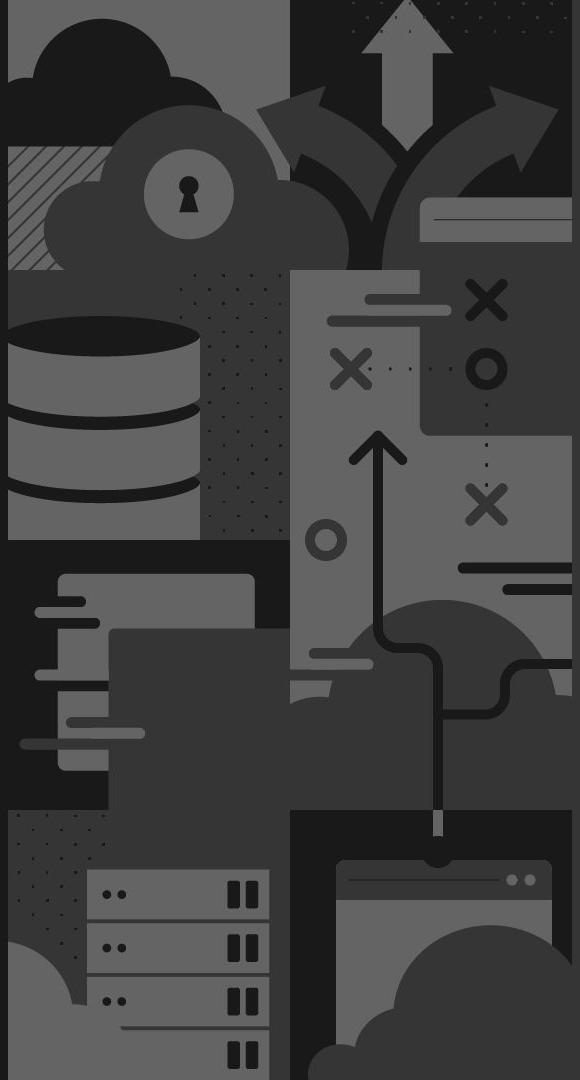

Hybrid Networking Stack Demo

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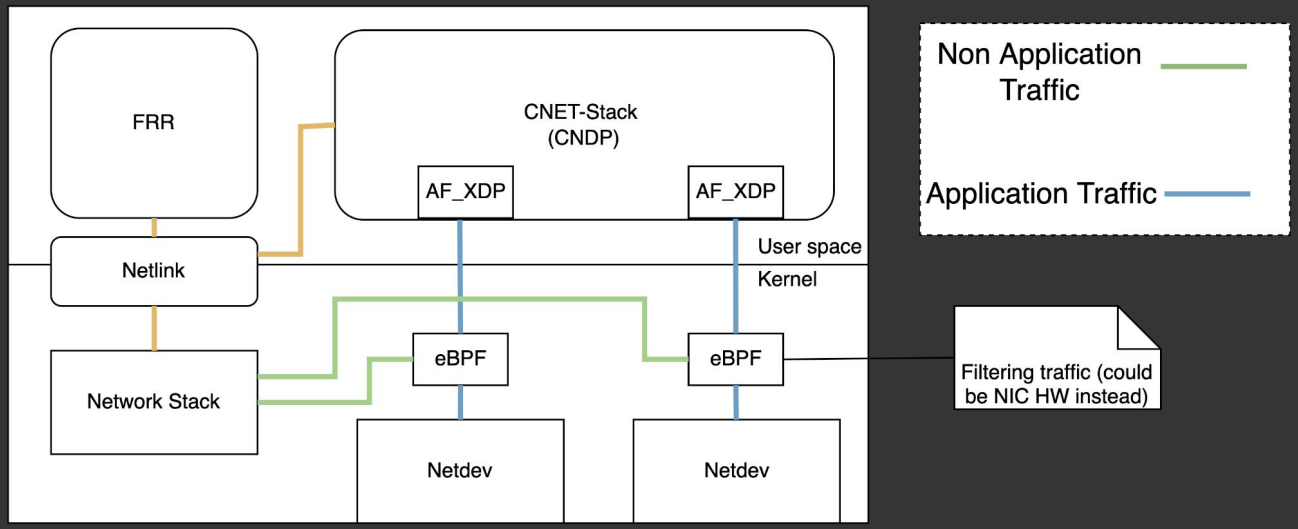
What we'll discuss today

- What is a Hybrid Network Stack?
- What is CNDP?
- Live Demo*
- Summary
- Q&A

What is a Hybrid Network Stack?



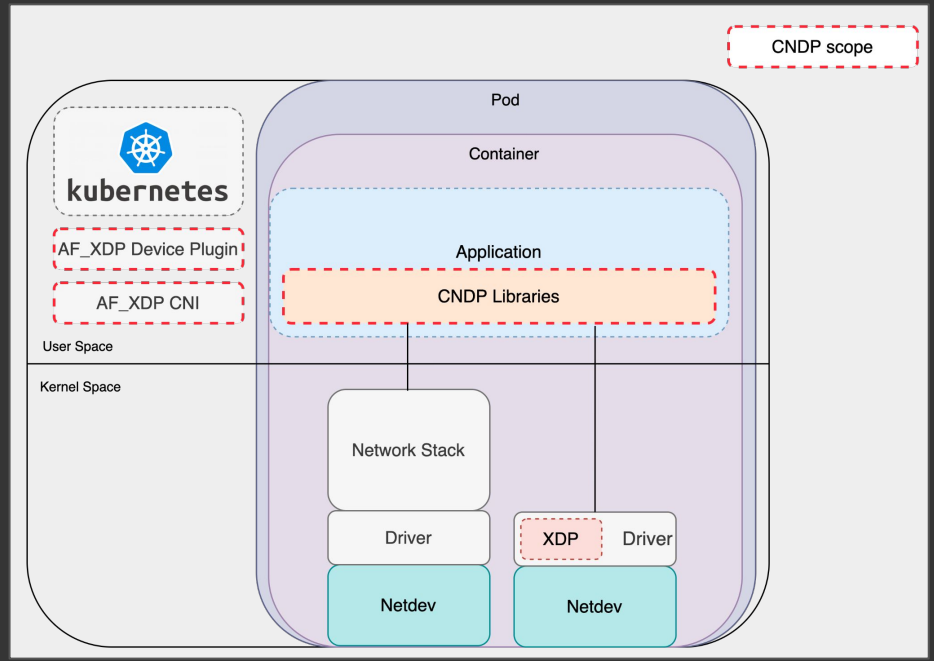
- A Network Stack for applications that use XDP/AF_XDP without reimplementing the full Linux Network Stack.
- `Control Plane` (CP) and `User Plane' (UP) separation.
- Traffic (Application/Non Application) filtered at the earliest point (HW or XDP) to the right target.

What is Cloud Native Data Plane (CNDP)?

CNDP is a new open source cloud native packet processing framework that aims to offer:

- A collection of userspace libraries for accelerating packet processing for cloud applications.
- A Hybrid Networking Stack (UP) that interworks with the Linux kernel networking stack.
- The Kubernetes components to provision and manage a CNDP deployment.

AF_XDP A new address family in the kernel that takes advantage of XDP



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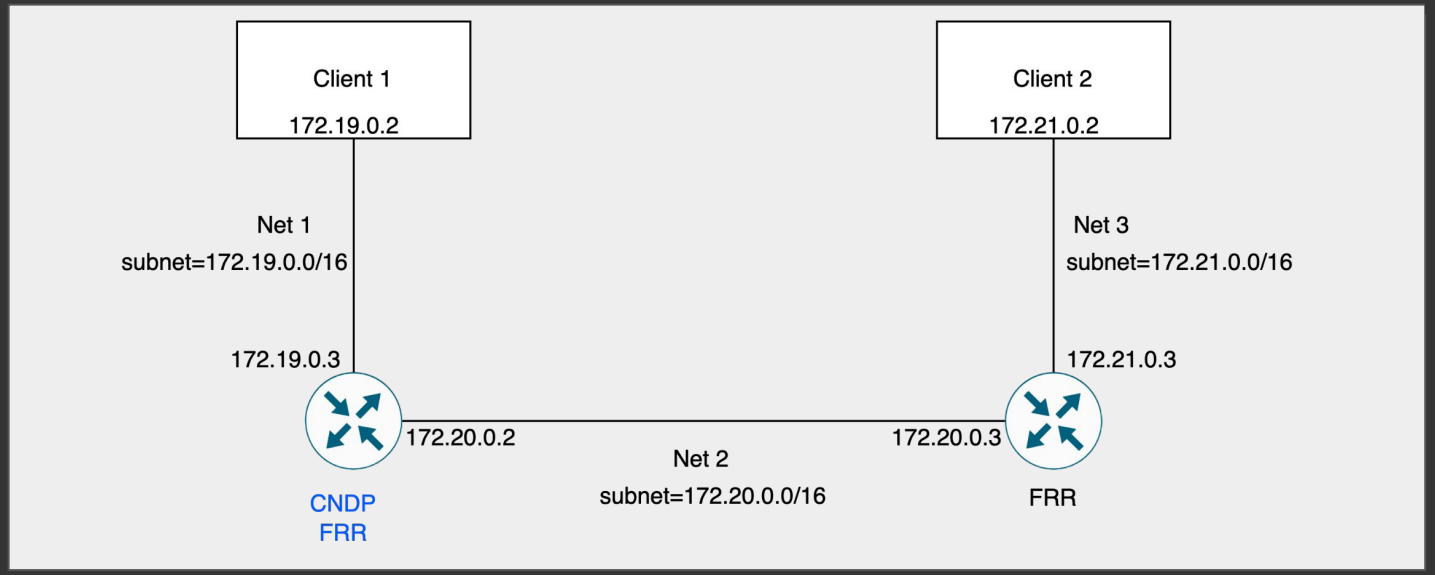
Demo: CNDP-FRR vRouter

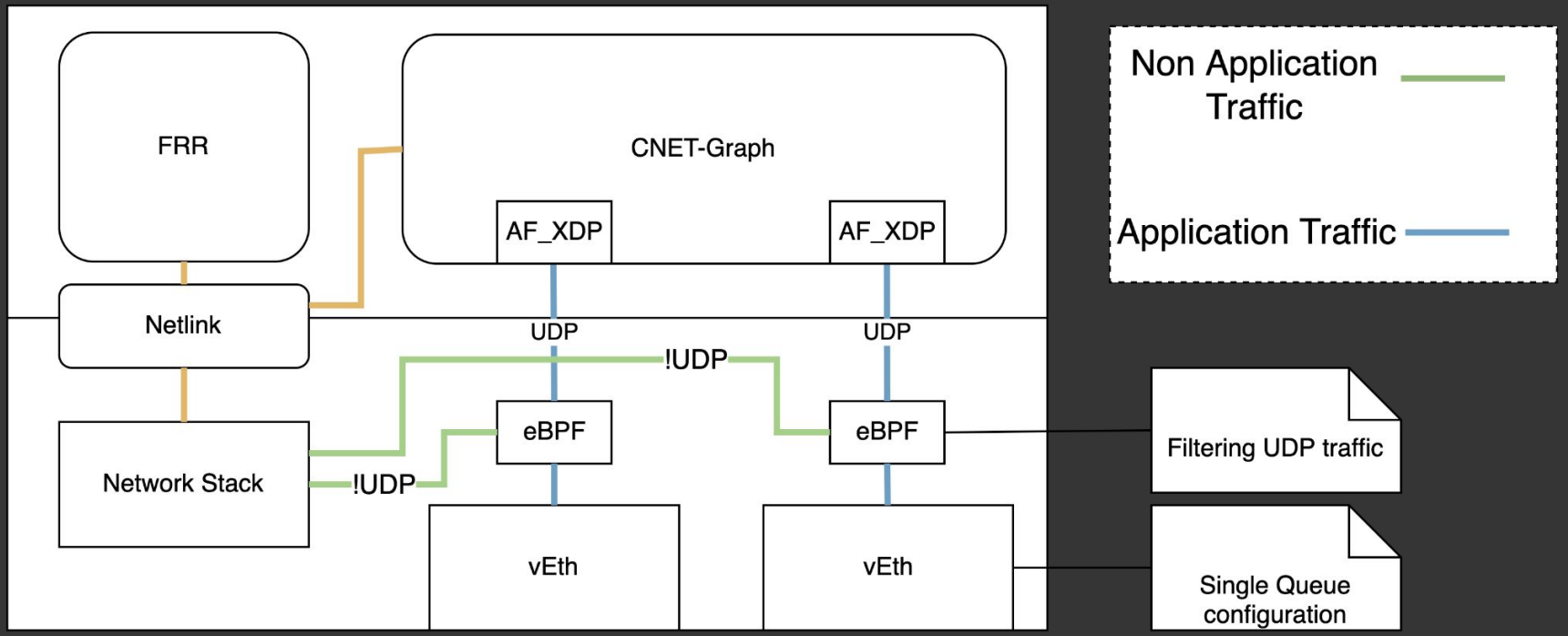


Goal: Build a Hybrid Networking stack application that accomplishes DPDK-like speeds with Kernel smarts.

Scenario:

- Two clients in two different networks
- Interconnected via vRouters that learn the routes using OSPF.

Zoom in: CNDP-FRR Node



Live Demo/Demo Recording

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Performance findings

The performance of AF_XDP is currently dependent on the deployment scenario.

- **North/south traffic** with **AF_XDP in native** mode **yields comparable performance to DPDK**.
- **East/west traffic** from a vEth pair **incurs significant cost** with **AF_XDP in native mode**.
- **East/west traffic** from a vEth pair with **AF_XDP in generic mode** yields **much better performance** than AF_XDP in native mode or the Linux stack.

Summary

It’s possible to leverage eBPF + AF_XDP through CNDP to build a Hybrid Networking Stack application that can meet the need of high performance use cases.

AF_XDP challenges include:

- xdp hints via kfuncs is a great cornerstone for offloads support
- Onus is on the infra to lifecycle manage BPF programs.
- AF_XDP multi-buffer support integration.
- `East-West` virtual interfaces performance optimization (AF_XDP native-mode).

Useful links

- https://github.com/CloudNativeDataPlane/cndp
- https://networkbuilders.intel.com/solutionslibrary/cloud-native-data-plane-cndp-overview-technology-guide
- https://github.com/maryamtahhan/cndp-frr

Thank you

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