Running a Platform for CNFs in 2023

The Good, the Bad and the Ugly

Marcel Fest | DT Technik GmbH | November 15, 2023

Who am I?

🏠 Located in Wesel, Germany

☕ Coffee drinker

🚵 Adventuresome, Casual cycling

🏂 Amateur snowboarder

🌹 Gardening

You can find me on:

Marcel Fest
Cloud Architect
**Deutsche Telekom
Technik GmbH**

The Mission

1. Reliable Kubernetes Clusters with well defined API Contract for internal customers

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2. Telco Grade Network Integration for Cloud Native Network Functions (CNFs)
3. Contribute to Upstream OpenSource projects to provide enhancements for our niche use-cases

01
The Narrative
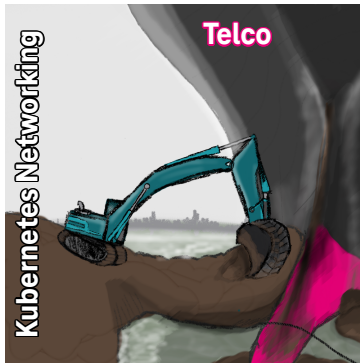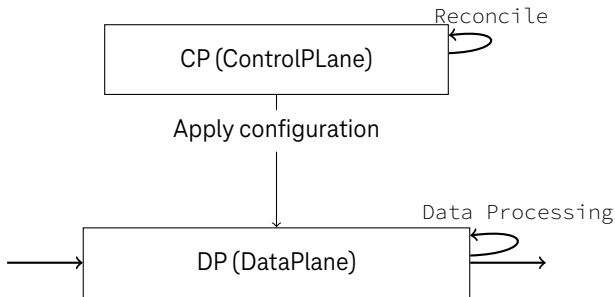
Running NF on Kubernetes in a Telco

Figure 1: Hosting a NF (Network Function) on vanilla Kubernetes! [1]

What is a CNF or VNF or PNF? Really what's an NF

History Lesson about NFs

- Everything started with **PNF**'s
  - normally it is a proprietary hardware chassis or black-box with labeled network ports
  - support and maintenance was done by the vendor and the updatecycle was around once/twice a year
- Than **VNF**s came around
  - These network functions are deployed in a VM (Virtual Machine)
  - First approach to consolidate on commodity hardware
  - The main NFVI (Network Function and Virtualization Infrastructure) is OpenStack
- The newest incarnation of a network function is the **CNF**
  - These network functions are deployed as a Container with 12-factors
  - Second approach to consolidate on commodity hardware
  - The main *NFCO (Network Function and Container Orchestrator)* is Kubernetes
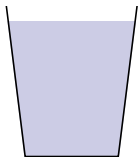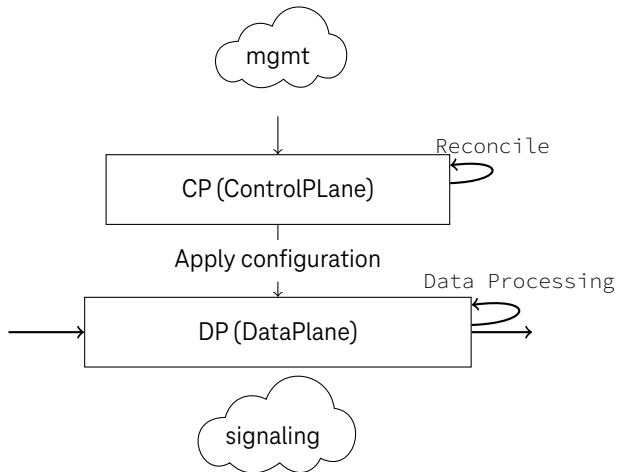
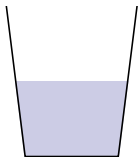# Lets hydronate and drink some VRF!

Figure 2: Glass with water getting empty.

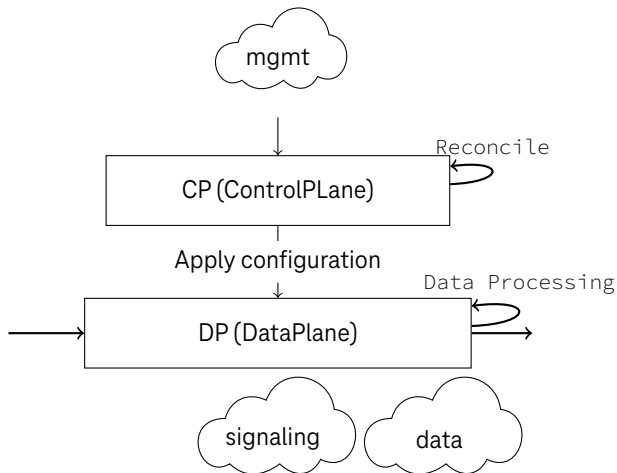# Lets hydronate and drink some VRF!

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mgmt

CP (ControlPLane)   Reconcile

Apply configuration

DP (DataPlane)   Data Processing

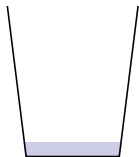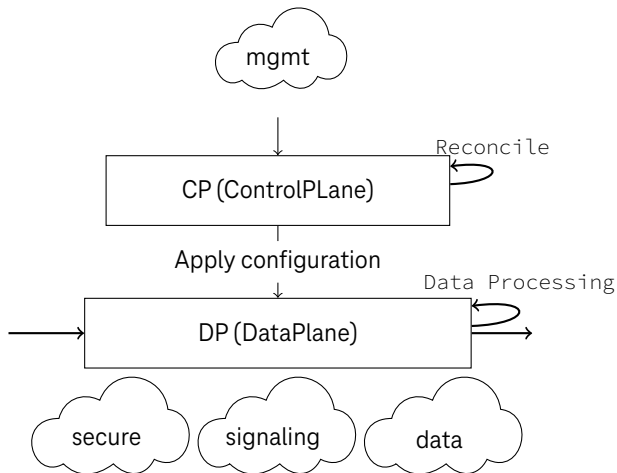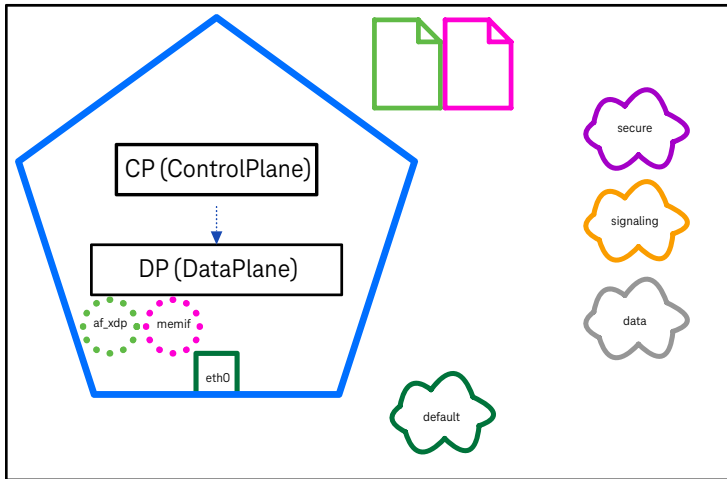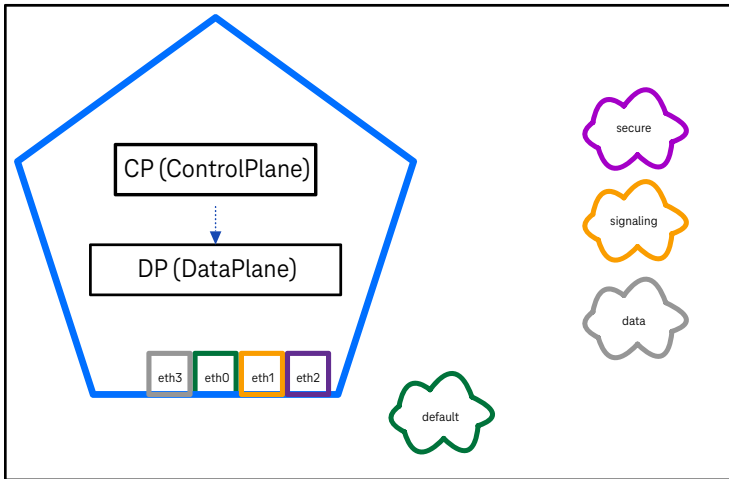signaling   data

Lets hydronate and drink some VRF!

Figure 2: Glass with water getting empty.

The Good CNF

The Bad & Ugly CNF

02
Conclusion

Conclusion

- Vendors like L2 ☎️ but we want to enforce **L3**
- Linux VRFs are a pain but can work if used with caution
- Vendors don't like Kubernetes CNI approach
- Vendors should standardize around AF_XDP or memif (of VPP) instead of legacy SR-IOV for the fast-datapath
- Vendors 🖤 interfaces instead of using multiple IPs (3GPP 🙃)
- DPUs might be an option to offload the VRF peering on the network card for our platform

END

END
Two years of BGP-EVPN to the host

References I

[1] Hannah Fest. Telco in a cloudnative world. Private handdrawn Picture under Creative Commons v2 License, May 2022. Accessed on 2022−05−03.