OPI API Meeting

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March 23, 2023

Red Hat

Vendor Dataplane View

OPI API used to define intent
- Controls both kernel networking and vendor dataplane
- Support for routing & flow based intent

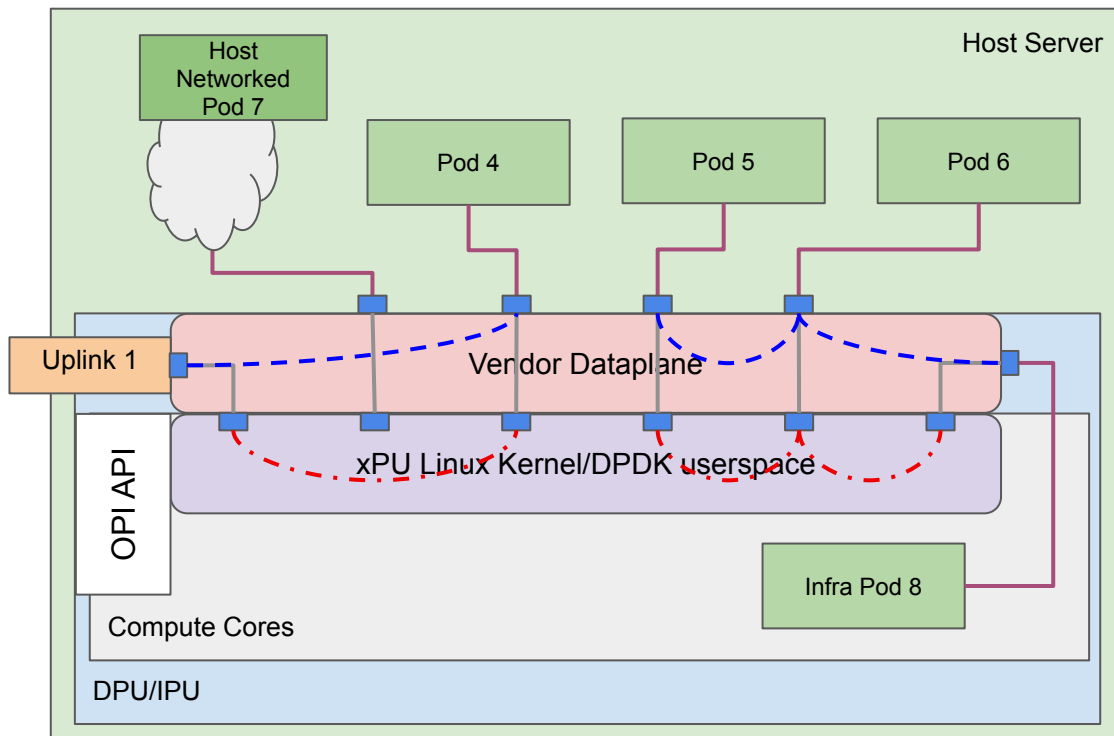Hardware abstraction API used to mirror state between kernel and vendor dataplane
- netlink / tc-flower / rte-flow
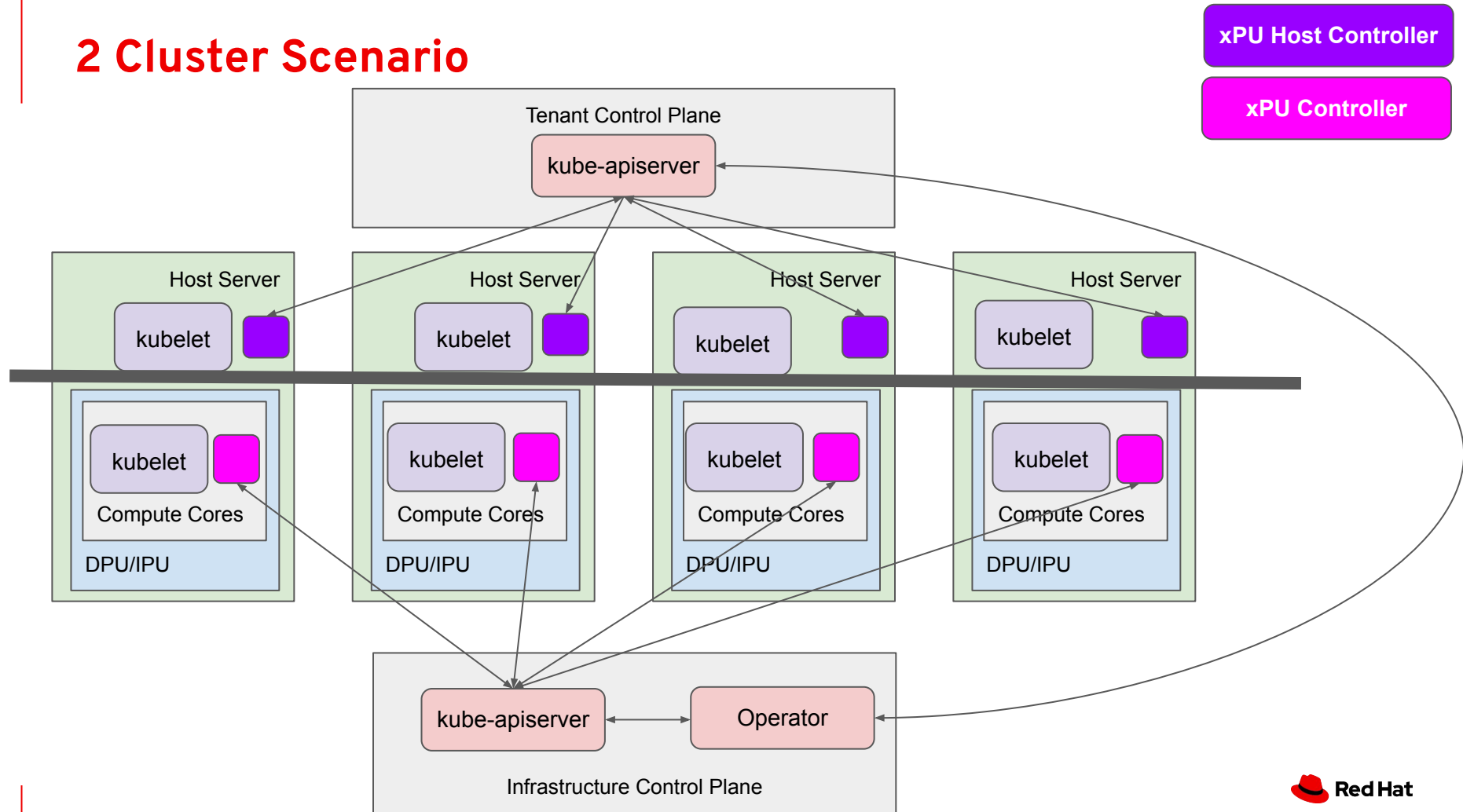
Control plane traffic handled by kernel

Fast path in vendor dataplane - - - - -

Fallback to slow path in kernel - · - · -

2 Cluster Scenario

Entities xPU

Operator

- Deploys the xPU Agent Daemonsets
- CRUDs OPI CRDs.
- Monitors Kubernetes resources in the tenant cluster.
- Translates incoming resources into OPI CRDs.
- Syncs OPI CRDs to the Tenant Cluster.

xPU Agent Daemonset

- Monitors OPI CRDs.
- Translates those CRDs into OPI API calls (which it also invokes).
- CRUDs OPI CRDs.
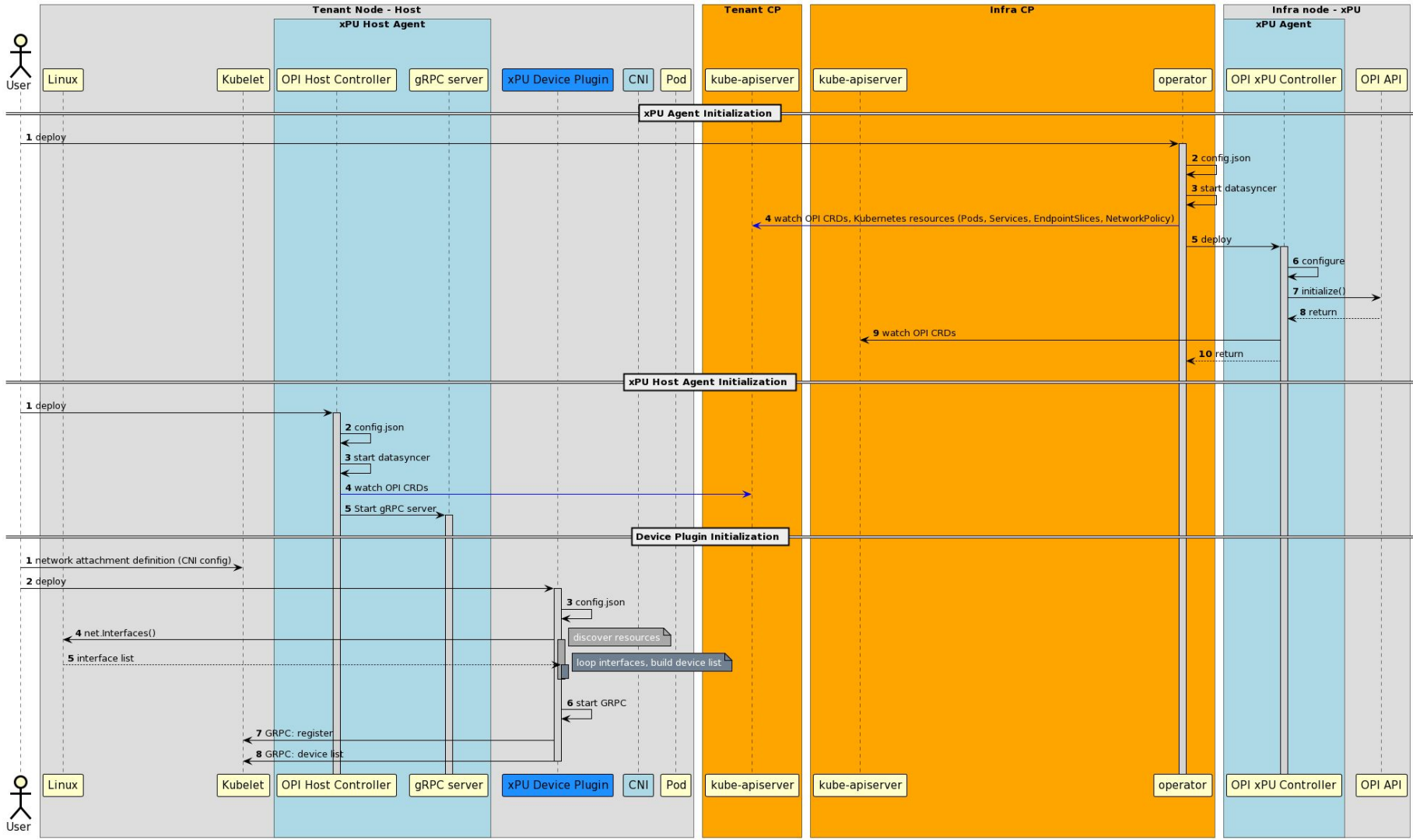
Entities Host

Device Plugin

- ▸ Provisions and advertises the VFs/SFs to Kubernetes.
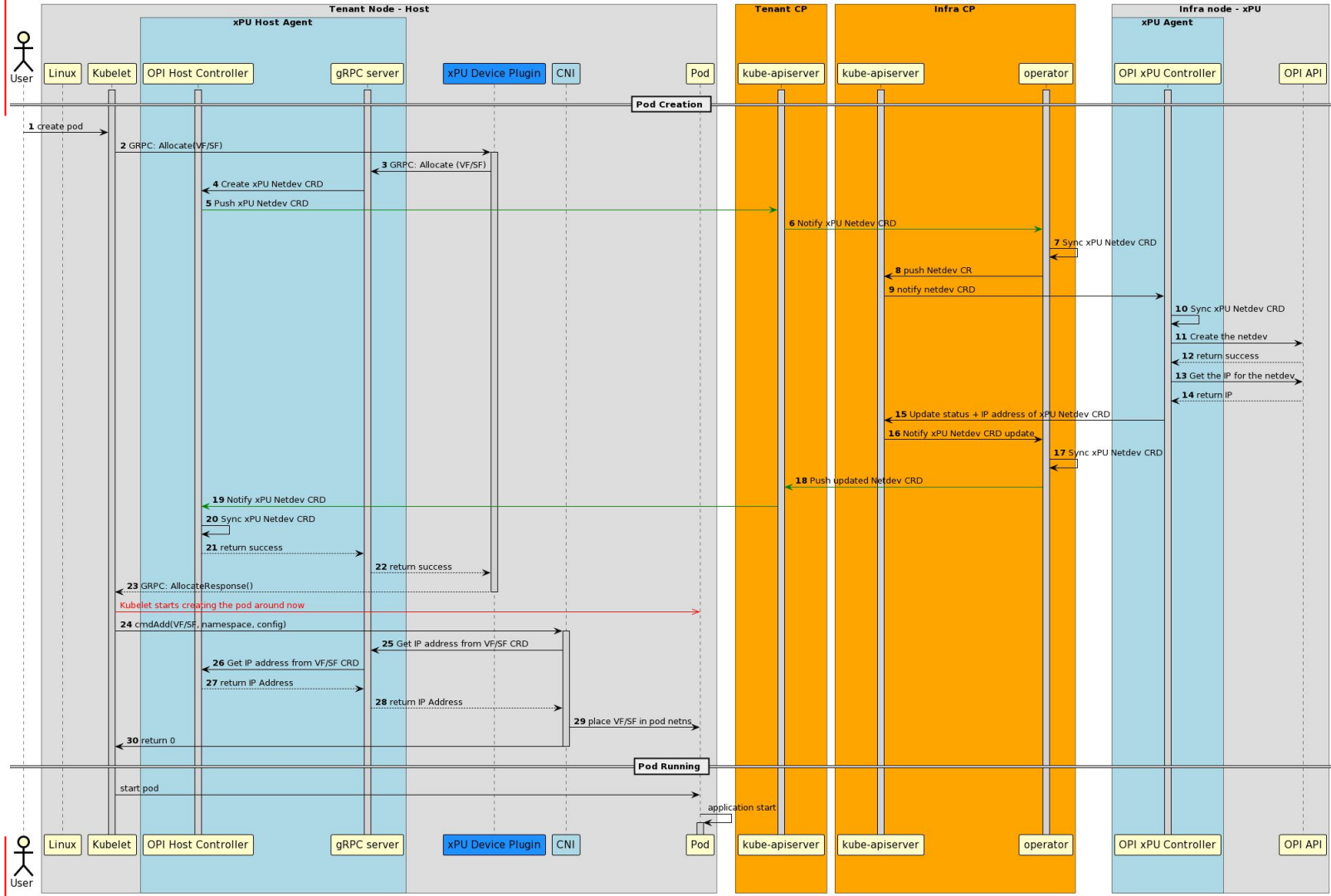- ▸ Interacts with the xPU Host agent to invoke the creation of OPI netdev CRDs on Pod allocation.
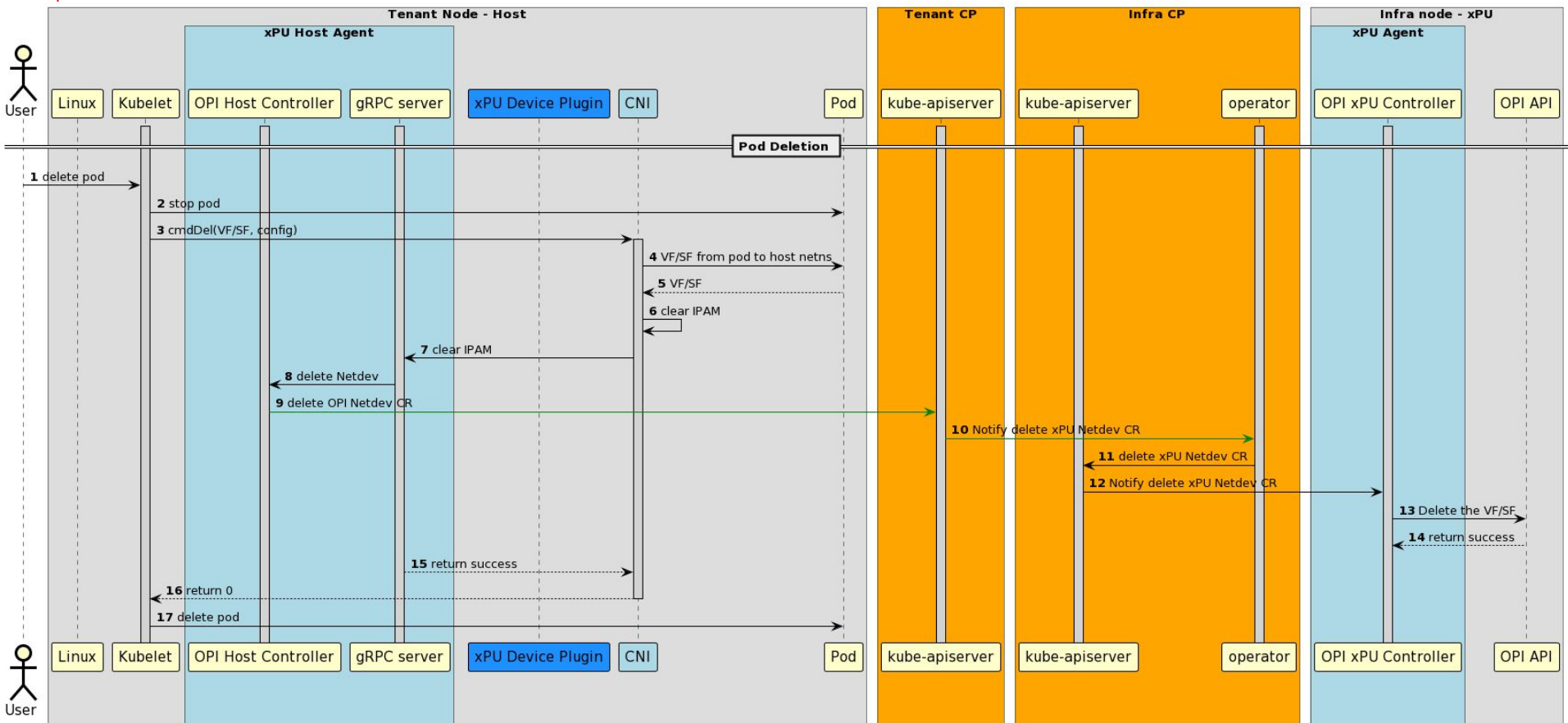
CNI

- ▸ Configures the interface with the allocated IP address
- ▸ Moves the VF/SF from the Host network namespace to the Pod Network namespace (vice versa).

xPU Host Agent Daemonset

- ▸ CRUDs OPI CRDs (from the Kube-apiserver or the Broker).
- ▸ Processes requests from the Device Plugin or CNI via a gRPC server.

Tenant Node - Host

xPU Host Agent

| User | Linux | Kubelet | OPI Host Controller | gRPC server | xPU Device Plugin | CNI | Pod |

Tenant CP — kube-apiserver

Infra CP — kube-apiserver | operator

Infra node - xPU

xPU Agent — OPI xPU Controller | OPI API

Pod Deletion

1 delete pod

2 stop pod

3 cmdDel(VF/SF, config)

4 VF/SF from pod to host netns

5 VF/SF

6 clear IPAM

7 clear IPAM

8 delete Netdev

9 delete OPI Netdev CR

10 Notify delete xPU Netdev CR

11 delete xPU Netdev CR

12 Notify delete xPU Netdev CR

13 Delete the VF/SF

14 return success

15 return success

16 return 0

17 delete pod

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Links to sequence diagrams

https://github.com/redhat-et/opi-k8s-networking/blob/5d3a466cc2ac0ed28c8afe524e3e43fc749967a1/sequence-diagrams/images/host-provisioning-xPU-VF-init.png

https://github.com/redhat-et/opi-k8s-networking/blob/5d3a466cc2ac0ed28c8afe524e3e43fc749967a1/sequence-diagrams/images/host-provisioning-xPU-VF-pod-creation.png

https://github.com/redhat-et/opi-k8s-networking/blob/5d3a466cc2ac0ed28c8afe524e3e43fc749967a1/sequence-diagrams/images/host-provisioning-xPU-VF-pod-deletion.png