



Using K8s Operators for RDMA Workloads

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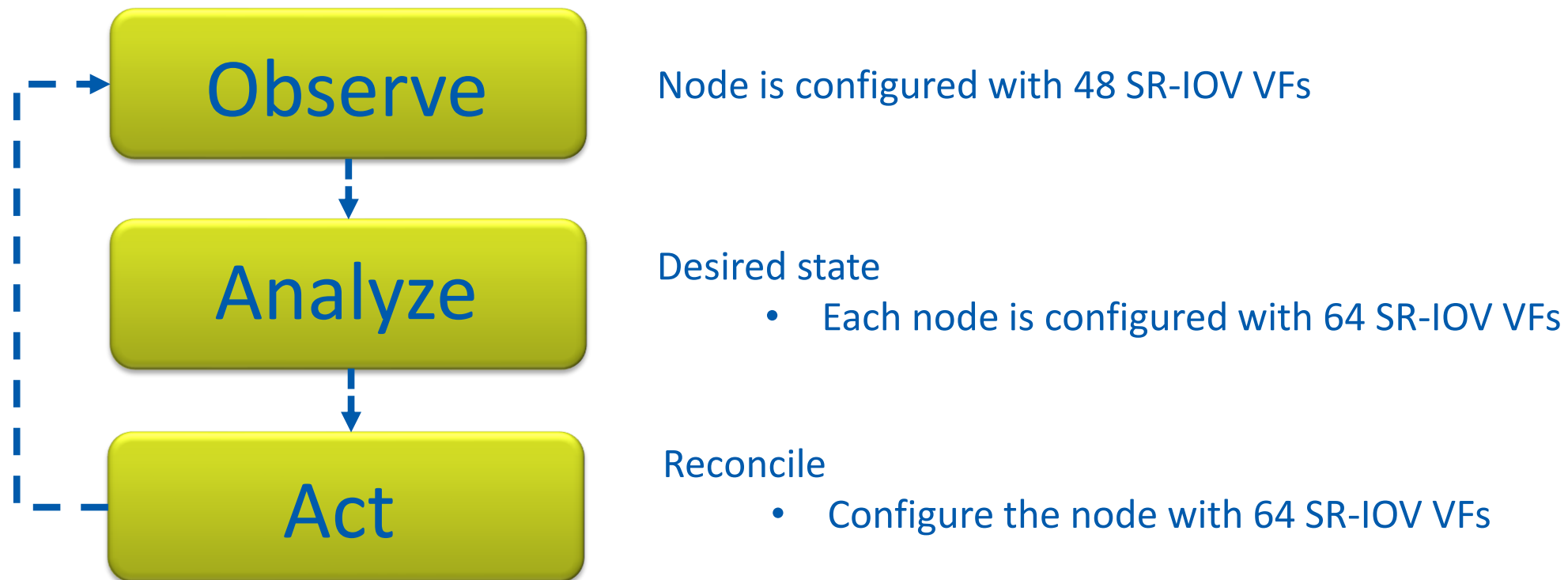
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Operators



What are Operators?

- **Operator** - method of packaging, deploying and managing a Kubernetes application
- Enables developers to
 - Extend and add new functionalities
 - Automate administration tasks as if they were a native Kubernetes component
- Operator = set of application-specific custom controllers



Operators

- **Why are Operators better than other tools out there?**

- Using standard Kubernetes tools, CLI and API
- Can monitor the cluster, change pods/services, scale up/down and call endpoints of the running applications
- Smarter and more tailored than generic tools

- **Who builds an Operator?**

- Best built by those that are experts in the “business logic” of installing, running and upgrading an application
- Creation of an Operator typically starts by automating an application installation and self-service provisioning capabilities
- Evolves to take on more complex automation

K8s RDMA Solution



RDMA/RoCE in K8s

- SR-IOV based solution
 - Each Container is assigned with an SR-IOV VF
 - Consist of the following K8s plugins
 - [SR-IOV Device Plugin for Kubernetes on GitHub](#)
 - SR-IOV VF provisioning
 - [SR-IOV CNI Plugin for Kubernetes on GitHub](#)
- Virtual networking in shared device mode
 - An IB device is shared between different pods



kubernetes



docker



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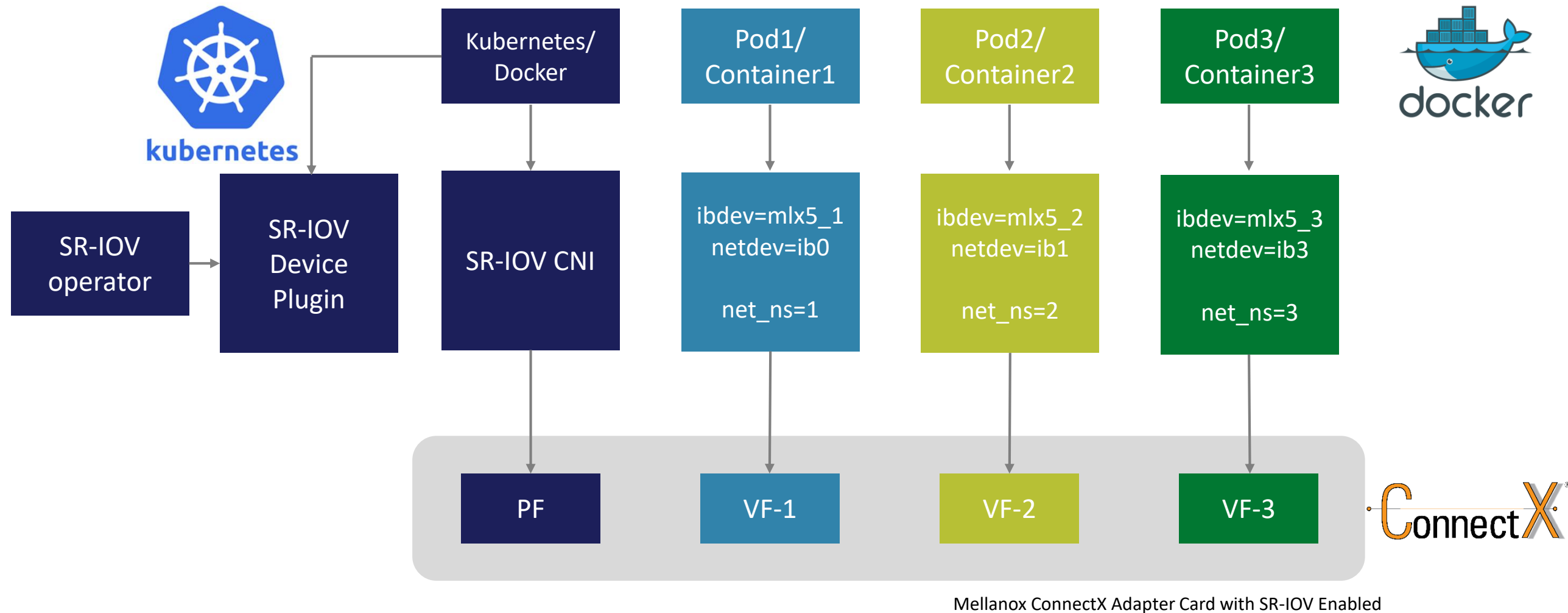


RoCE™

ConnectX®

RDMA at the Container Level using SR-IOV

Technical Overview

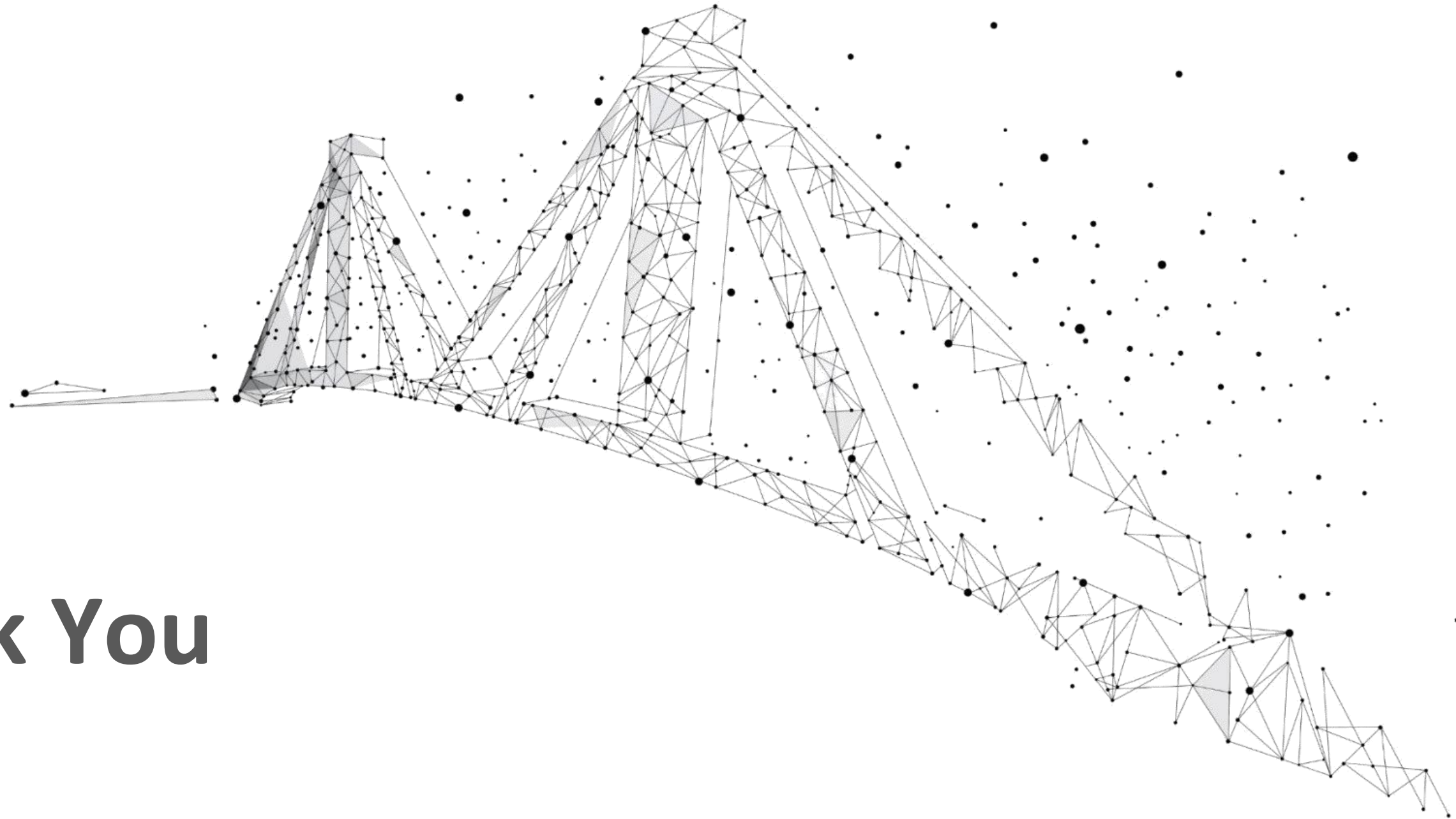


- Every container/POD has an IB device (mlx5_1,2,3) and netdevice

Operators for RDMA Workloads

- Why do we need operators for running RDMA workloads?
 - Running RDMA/RoCE workloads requires several configurations
 - Automating these configuration allows ease of use
- Required configurations
 - Driver installation
 - Link state configuration – Infiniband/Ethernet
 - For SR-IOV based solution:
 - FW configuration
 - SR-IOV enable
 - Setting Number of VF's
 - VFs activation
 - GUID and MAC address configuration





Thank You

