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Local Volume Static Provisioning

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Local Persistent Volumes

- **What:** Local storage resources bound to a node
- **Use cases**
  - Distributed replicated systems, e.g. TiDB, etcd
  - Local caching
- **Status:** GA in Kubernetes 1.14
- **How to use local PVs:** via PVC
- **How to provision local PVs**
  - Provision static local volumes with local-volume-provisioner
  - Provision local volumes dynamically (WIP)

local-volume-provisioner

- **Project:** https://github.com/kubernetes-sigs/sig-storage-local-static-provisioner
- **Summary:** Discover and configure local volumes on the nodes in Kubernetes and recycle them when not being used automatically
- **How to use**
  - First, configure local volumes on the nodes
  - Second, configure and deploy local-volume-provisioner to discovery, provision PVs and manage them

Configure local volumes

Typical ways to configure local volumes on your machines

- **Block volumes**
  - link the block devices into the discovery directory
    - *ln -s /dev/sdb /mnt/disks*
- **Filesystem volumes**
  - mount the entire filesystem into the discovery directory
    - *mkdir /mnt/disks/vol1*
    - *mount /dev/sdb /mnt/disks/vol1*
  - share the filesystem by multiple directories (bind is required)
    - *mount /dev/sdb /mnt/disks*
    - *mount --bind /mnt/disks/vol1 /mnt/disks/vol1*

Configure and deployment

- Clone the repository:
  - *git clone https://github.com/kubernetes-sigs/sig-storage-local-static-provisioner/*
- Generate manifest yaml files by using helm with your customized values
  - edit values file with your discovery directory and storage class
  - *helm template helm/provisioner/ --values custom-values.yaml > provisioner.yaml*
- Deploy
  - *kubectl apply -f provisioner.yaml*
- Follow this link to learn more
  - https://github.com/kubernetes-sigs/sig-storage-local-static-provisioner/tree/master/helm

Best Practices

- The path of the local PV is the unique identifier of local storage on the node, it's recommended to utilize the UUID of the device to generate path
- For IO isolation, a whole disk per volume is recommended
  - It's very hard to schedule IOPS in deterministic behavior compared to memory and CPU.
- For capacity isolation, separate partition per volume is recommended

Thank you!