DEVCONF.cz

Self service cluster deployment using MCE

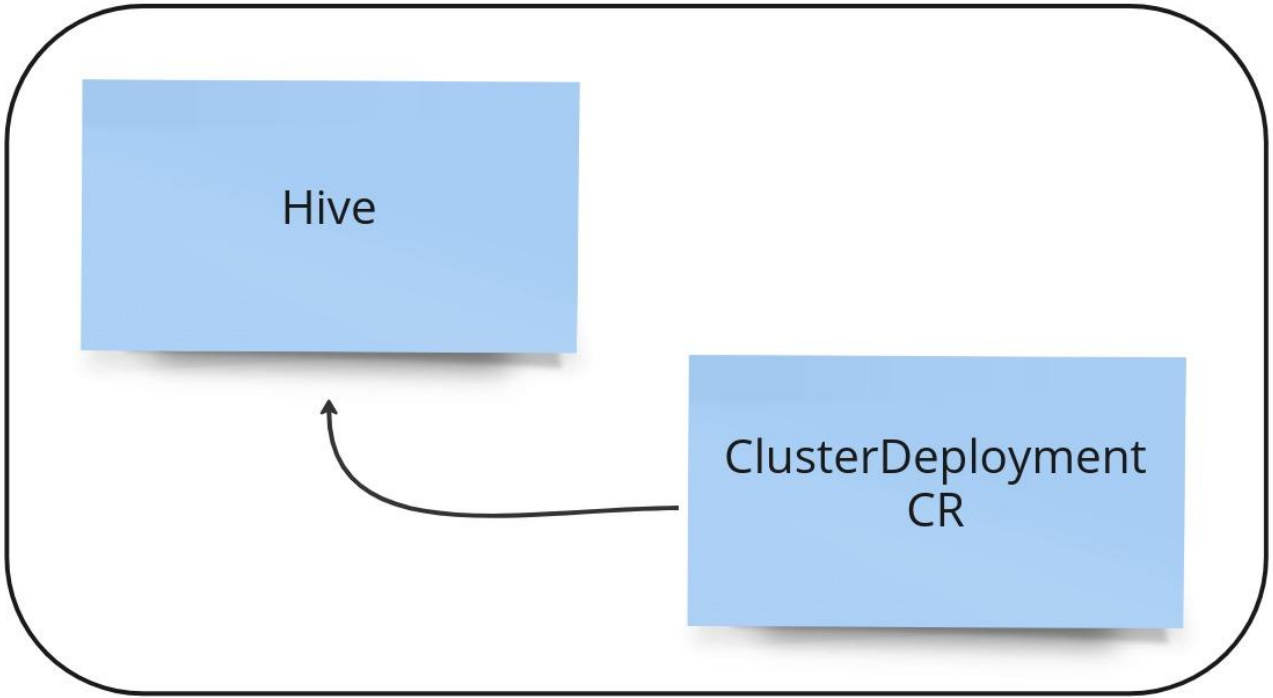
Rastislav Wágner
PSE@Red Hat

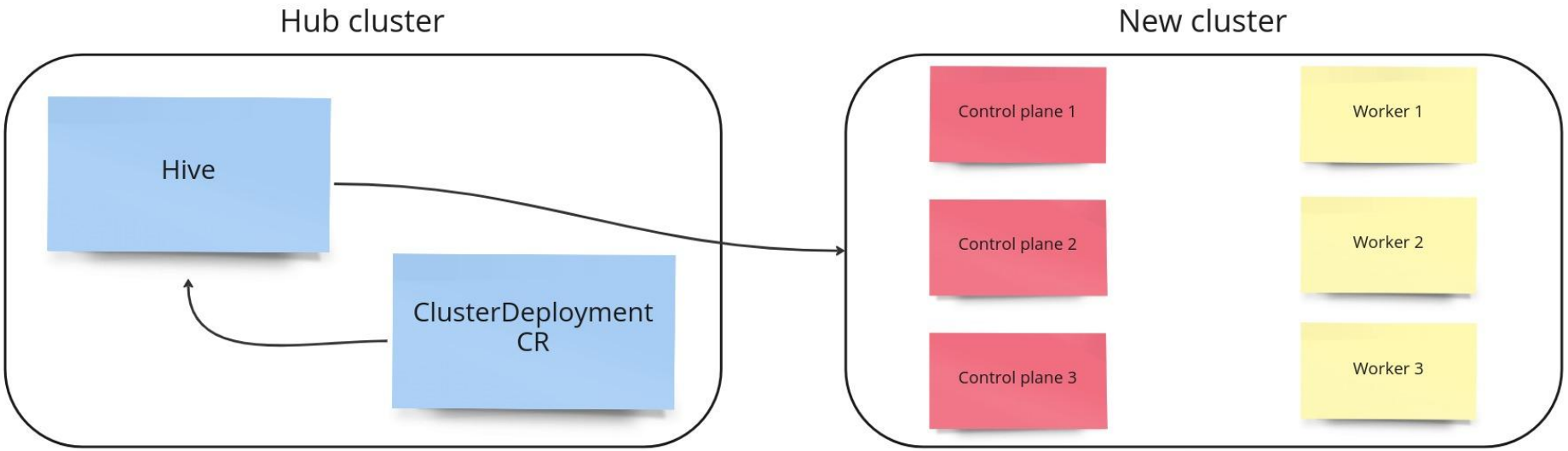
Cluster deployment using MCE - Hive

Hive

API driven OpenShift 4 cluster provisioning and management. Hive is an operator which runs as a service on top of Kubernetes/OpenShift. The Hive service can be used to provision and perform initial configuration of OpenShift clusters.

Hub Cluster


Hub Cluster
Hive
ClusterDeployment
CR


Hub cluster
Hive
ClusterDeployment CR
New cluster
Control plane 1
Control plane 2
Control plane 3
Worker 1
Worker 2
Worker 3

Hive API
ClusterDeployment CR

```yaml
apiVersion: hive.openshift.io/v1
kind: ClusterDeployment
metadata:
  name: mycluster
  namespace: devuserns
spec:
  baseDomain: foo.com
  clusterInstallRef:
    group: extensions.hive.openshift.io
    kind: AgentClusterInstall
    name: mycluster
    version: v1beta1
  clusterName: mycluster
  platform:
    agentBareMetal:
      agentSelector:
        matchLabels:
          infraenvs.agent-install.openshift.io: bm-infra
  pullSecretRef:
    name: pullsecret
```

DEV CONF .CZ

```yaml
apiVersion: extensions.hive.openshift.io/v1beta1
kind: AgentClusterInstall
metadata:
  name: mycluster
  namespace: devuserns
spec:
  clusterDeploymentRef:
    name: mycluster
  provisionRequirements:
    controlPlaneAgents: 3
    workerAgents: 3
  imageSetRef:
    name: 411-imageset
  networking:
    clusterNetwork:
    - cidr: 10.128.0.0/14
      hostPrefix: 23
    serviceNetwork:
    - 172.30.0.0/16
  apiVIP: 192.168.122.10
  ingressVIP: 192.168.122.23
```

DEV CONF .CZ

- Admin oriented flow

- Admin oriented flow
- ClusterDeployment requires knowledge of underlying infrastructure

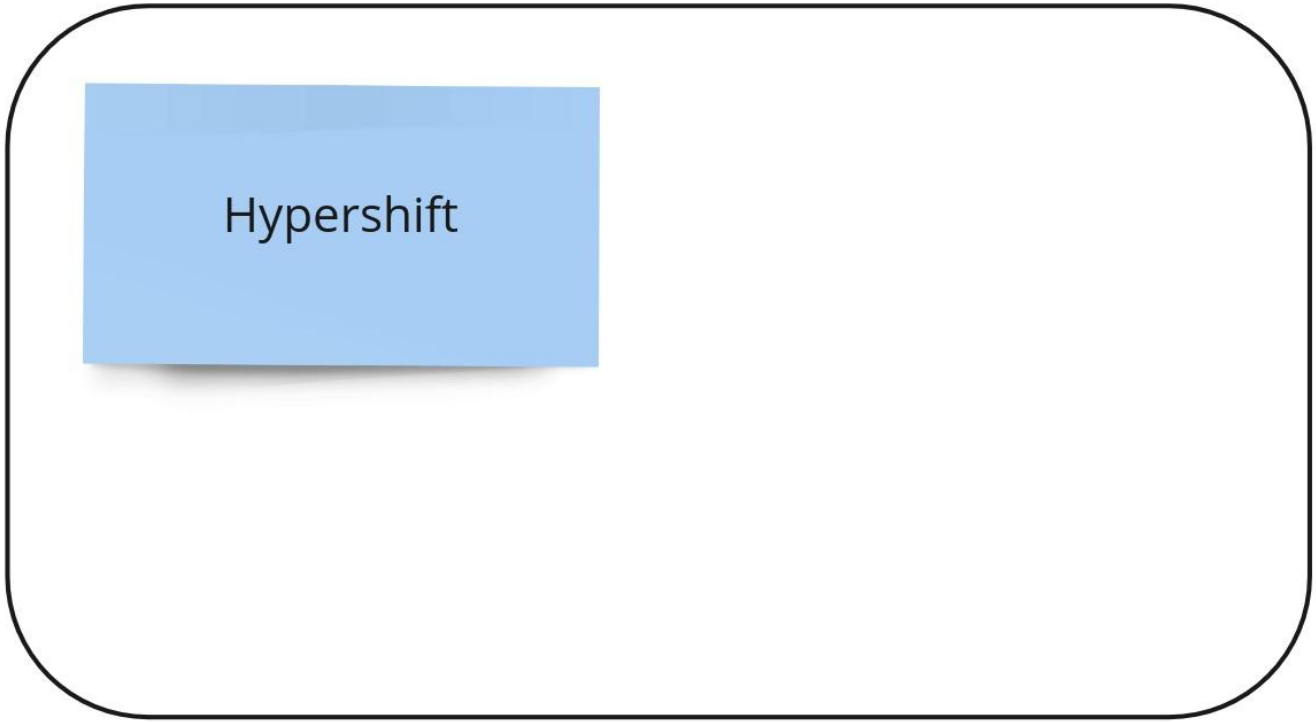
- Admin oriented flow
- ClusterDeployment requires knowledge of underlying infrastructure
- Permission to create ClusterDeployment CR gives ability to create any kind of cluster

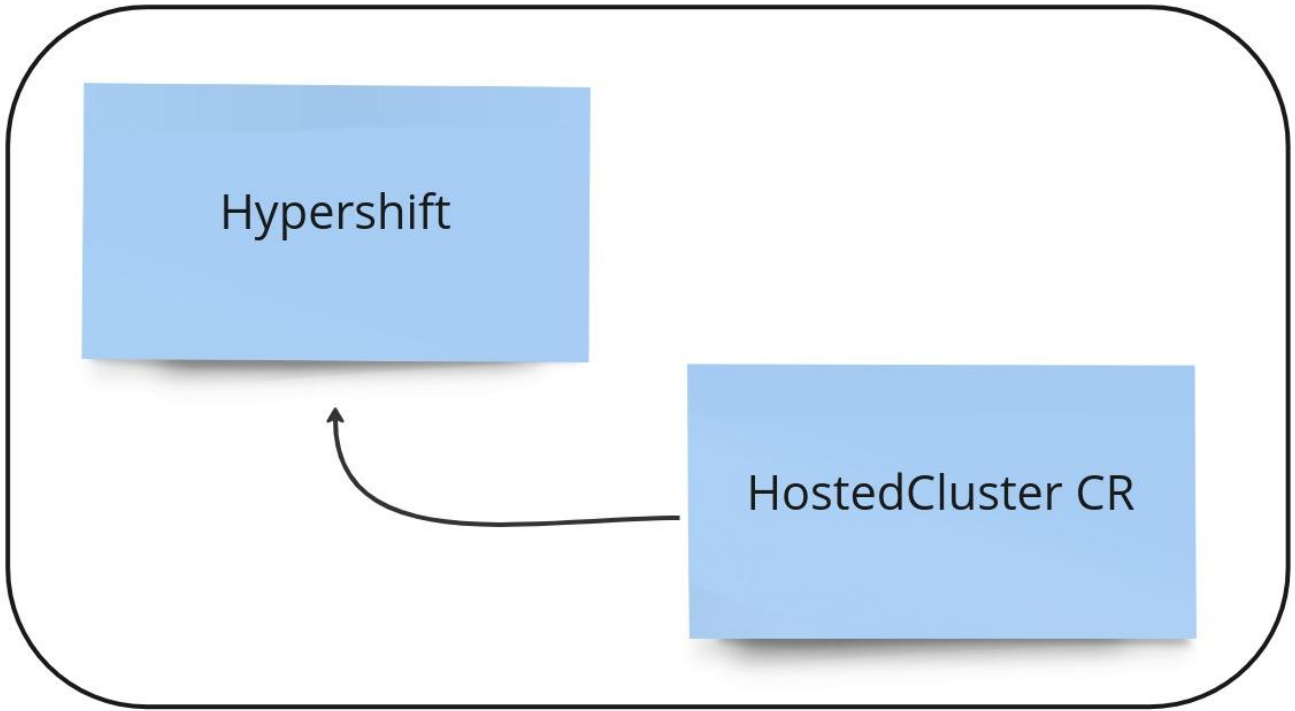
Cluster deployment using MCE - Hypershift

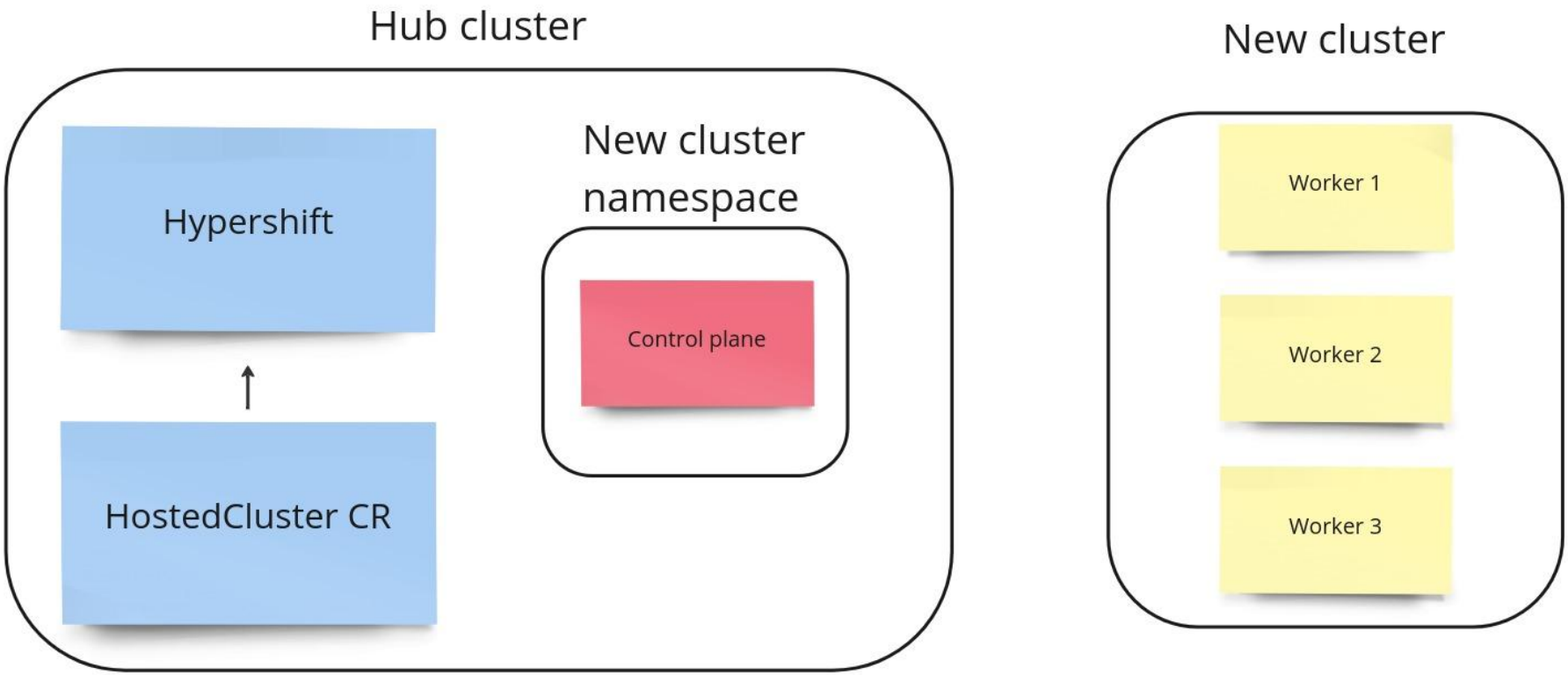
Hypershift

HyperShift is a middleware for hosting OpenShift control planes at scale that solves for cost and time to provision, as well as portability cross cloud with strong separation of concerns between management and workloads.

Hub cluster




Hub cluster
Hypershift
HostedCluster CR


Hub cluster
Hypershift
HostedCluster CR
New cluster
namespace
Control plane
New cluster
Worker 1
Worker 2
Worker 3

Hypershift API HostedCluster CR

```yaml
apiVersion: hypershift.openshift.io/v1alpha1
kind: HostedCluster
metadata:
  name: mycluster
  namespace: devuserns
spec:
  release:
    image: quay.io/openshift-release-dev/ocp-release:4.11.9-multi-x86_64
  pullSecret:
    name: pullsecret
  sshKey:
    name: sshkey
  networking:
    podCIDR: 10.132.0.0/14
    serviceCIDR: 172.31.0.0/16
    machineCIDR: 192.168.122.0/24
    networkType: OVNKubernetes
  platform:
    type: Agent
    agent:
      agentNamespace: bm-infra
  infraID: mycluster
  dns:
    baseDomain: foo.com
  ...
```

```yaml
apiVersion: hypershift.openshift.io/v1alpha1
kind: NodePool
metadata:
  name: nodepool-mycluster
  namespace: devuserns
spec:
  clusterName: mycluster
  replicas: 3
  management:
    autoRepair: false
    upgradeType: InPlace
  platform:
    type: Agent
    agent:
      agentLabelSelector:
        matchLabels: {}
  release:
    image: quay.io/openshift-release-dev/ocp-release:4.11.9-multi-x86_64
```

DEV CONF .CZ

- Admin oriented flow

- Admin oriented flow
- HostedCluster CR requires knowledge of underlying infrastructure

- Admin oriented flow
- HostedCluster CR requires knowledge of underlying infrastructure
- Permission to create HostedCluster CR gives ability to create any kind of cluster

- Admin oriented flow
- HostedCluster CR requires knowledge of underlying infrastructure
- Permission to create HostedCluster CR gives ability to create any kind of cluster

Dev users can not deploy their own clusters via current set of APIs

DEV CONF .CZ

Cluster as a service operator

Cluster as a service operator

- Adds guard-rails to existing cluster deployment solutions - Hive and Hypershift

Cluster as a service operator

- Adds guard-rails to existing cluster deployment solutions - Hive and Hypershift
  - Clusters are defined as templates

Cluster as a service operator

- Adds guard-rails to existing cluster deployment solutions - Hive and Hypershift
  - Clusters are defined as templates
  - Cluster quota similar to k8s resource quota

Cluster as a service operator

- Adds guard-rails to existing cluster provisioning solutions - Hive and Hypershift
  - Clusters are defined as templates
  - Cluster quota similar to k8s resource quota
- Enables any kind of post-installation cluster setup

Demo

Cluster as a service operator repository

https://github.com/stolostron/cluster-templates-operator