

Operator Lifecycle Manager

Late 2017...

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Tectonic 1.8 and the Open Cloud Services Catalog are now available

December 19, 2017 • By Neil McAllister

Tags: [announcements](#) [Tectonic](#) [Open Cloud Services](#) [Kubernetes](#)



Today we're proud to announce Tectonic 1.8, the latest release of our enterprise-ready Kubernetes platform, is now available. This version, which we announced ahead of [KubeCon + CloudNativeCon North America](#) earlier this month, is the first to ship with a catalog of industry-first Open Cloud Services that enable users to deploy key infrastructure components with the ease of managed cloud vendor offerings but without cloud vendor lock-in.




The first three offerings in the CoreOS Tectonic Open Cloud Service Catalog are based on etcd, Prometheus, and Vault. You can learn more about what each of these services delivers in [our previous blog post](#), and we'll dive into each of them in separate posts soon. What all Open Cloud Services share in common, though, is that they automate key operational tasks such as security updates, scaling and handling failover, making backups, and so on, allowing users to concentrate their focus on managing their applications and not the infrastructure they run on.

These powerful services are the latest building blocks in the complete Tectonic platform, which combines pure, upstream open source Kubernetes with features like authentication and authorization, monitoring and alerting, and ease of installation and management. For more information on what's new with Tectonic 1.8, [check out the release notes](#).

Tectonic 1.8 Dashboard with OCS

The screenshot displays the Tectonic 1.8 dashboard interface. On the left is a dark blue sidebar with the Tectonic logo and a list of navigation items: Applications, Available Applications, Open Cloud Catalog (highlighted), Workloads, Daemon Sets, Deployments, Replica Sets, Replication Controllers, Persistent Volume Claims, Stateful Sets, Jobs, Pods, Config Maps, Secrets, Resource Quotas, Open Cloud Services, Routing, and Troubleshooting. The main content area is divided into two sections. The top section, 'Open Cloud Services', shows a table with one entry: 'Open Cloud Services' provided by 'CoreOS, Inc'. The bottom section, 'Applications', features a search filter 'Filter Applications by name...' and a table listing three applications: 'etcd' (0.6.1 by CoreOS, Inc), 'Prometheus' (0.14.0 by CoreOS, Inc), and 'Vault' (0.1.3 by CoreOS, Inc). Each application entry includes an icon, name, version, provider, status ('Enabled (1 namespace)'), a 'Show namespace' link, and an 'Enable' button.

NAME	PROVIDER
Open Cloud Services	CoreOS, Inc

NAME ↑	STATUS
 etcd 0.6.1 by CoreOS, Inc	Enabled (1 namespace) Show namespace
 Prometheus 0.14.0 by CoreOS, Inc	Enabled (1 namespace) Show namespace
 Vault 0.1.3 by CoreOS, Inc	Enabled (1 namespace) Show namespace

What is the Operator Lifecycle Manager (OLM)?

OLM is the..

Installation (`InstallPlan`)

Definition (`ClusterServiceVersion`)

Resolution (`CatalogSource`)

Upgrading (`Subscription/Package`)

of....

Operators!

Okay..but what **IS** it?

OLM...

- Provides an App-Store like experience for discovering and installing Operators.
- Automated upgrades for Operators.
- Provides a framework building rich, reusable UIs.
- Package management and dependency resolution.

That's all good..but seriously...

What IS IT?

An Operator.

But not just one Operator.

OLM-Operator

Three Operators.

OLM-Operator

Catalog-Operator

Package-Server

Before we dive into the details, let's take a couple of steps back and visualize our environment in the context of OLM.



OLM OpenShift Environment

accounting

marketing



openshift-operator-lifecycle-manager

sourceType: External

CatalogSource1
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

OLM-Operator

olm-operator-serviceaccount

Catalog-Operator

olm-operator-serviceaccount

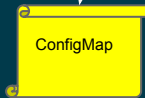
sourceType: Internal

CatalogSource2
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

Package-Server

olm-operator-serviceaccount



ConfigMap

CRDs

Subscription

InstallPlan

CatalogSource

ClusterServiceVersion



Deploying an Operator via OLM

accounting

marketing

openshift-operator-lifecycle-manager



Admin



User

ownerRef: ClusterServiceVersion

ServiceAccount
Name: etcd-operator
ownerRef: ClusterServiceVersion

Role
Name: etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

RoleBinding
Name: etcdoperator.v0.9.0-0

etcd-Operator
etcd-operator

Subscription
name: etcd
channel: alpha
source: CatalogSource2

ownerRef: Subscription

InstallPlan
clusterServiceVersion: etcd-operator.v0.9.0-0
Approval: Manual/Automatic

ClusterServiceVersion

ConfigMap

sourceType: External

CatalogSource1
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversions.yaml
- etcdoperator.v0.9.0.clusterserviceversions.yaml
- etcdoperator.v0.9.2.clusterserviceversions.yaml
- etcdrestore.crd.yaml

sourceType: Internal

CatalogSource2
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversions.yaml
- etcdoperator.v0.9.0.clusterserviceversions.yaml
- etcdoperator.v0.9.2.clusterserviceversions.yaml
- etcdrestore.crd.yaml

OLM-Operator
olm-operator-serviceaccount

Catalog-Operator
olm-operator-serviceaccount

Package-Server
olm-operator-serviceaccount

CRDs

- Subscription
- InstallPlan
- CatalogSource
- ClusterServiceVersion
- EtcClusters
- EtcBackups
- EtcRestore

User Creates CR

marketing



User



openshift-operator-lifecycle-manager

ownerRef: ClusterServiceVersion

kind: ServiceAccount
Name: etcd-operator

ownerRef: ClusterServiceVersion

kind: Role
Name:
etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: RoleBinding
Name:
etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: Deployment
etcd-Operator
etcd-operator

kind: Subscription
name: etcd
channel: alpha
source CatalogSource1

ownerRef: Subscription

kind: InstallPlan
clusterServiceVersionName
-etcd-operator.v0.9.0
Approval: Manual/Automatic

Kind: ClusterServiceVersion



Kind: etcdCluster
name: myetcdcluster
spec.node: 3

ownerRef: myetcdcluster

etcd-pod1

ownerRef: myetcdcluster

etcd-pod2

ownerRef: myetcdcluster

etcd-pod3

sourceType: External

CatalogSource1
Publisher: Red Hat
etcd.package.yaml
etcdbackup.crd.yaml
etcdcluster.crd.yaml
etcdoperator.clusterserviceversi...
etcdoperator.v0.9.0.clusterservi...
etcdoperator.v0.9.2.clusterservi...
etcdrestore.crd.yaml

OLM-Operator
olm-operator-serviceaccount

Catalog-Operator
olm-operator-serviceaccount

Package-Server
olm-operator-serviceaccount

sourceType: Internal

ConfigMap

CatalogSource2
Publisher: Google
etcd.package.yaml
etcdbackup.crd.yaml
etcdcluster.crd.yaml
etcdoperator.clusterserviceversi...
etcdoperator.v0.9.0.clusterservi...
etcdoperator.v0.9.2.clusterservi...
etcdrestore.crd.yaml

CRDs

- Subscription
- InstallPlan
- CatalogSource
- ClusterServiceVersion
- EtcdClusters
- EtcdBackups
- EtcdRestore

Updating CatalogSource



openshift-operator-lifecycle-manager

marketing



ownerRef: ClusterServiceVersion

kind: ServiceAccount
Name: etcd-operator

ownerRef: ClusterServiceVersion

kind: Role
Name: etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: RoleBinding
Name: etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: Deployment
etcd-Operator
etcd-operator

kind: Subscription
name: etcd
channel: alpha
source CatalogSource1

ownerRef: Subscription

kind: InstallPlan
clusterServiceVersionName -etcd-operator.v0.9.0
Approval: Manual/Automatic

Kind: ClusterServiceVersion



ownerRef: Subscription
kind: InstallPlan
clusterServiceVersionName -etcd-operator.v0.9.2
Approval: Manual/Automatic

Kind: etcdCluster
name: myetcdcluster
spec.node: 3

ownerRef: myetcdcluster

etcd-pod1

ownerRef: myetcdcluster

etcd-pod2

ownerRef: myetcdcluster

etcd-pod3

sourceType: External

CatalogSource1
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

OLM-Operator
olm-operator-serviceaccount

Catalog-Operator
olm-operator-serviceaccount

Package-Server
olm-operator-serviceaccount

sourceType: Internal



CatalogSource2
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

currentCSV: etcdoperator.v0.9.2

CRDs

- Subscription
- InstallPlan
- CatalogSource
- ClusterServiceVersion
- EtcdClusters
- EtcdBackups
- EtcdRestore

ClusterServiceVersion is Analogous to a Package

ClusterServiceVersion

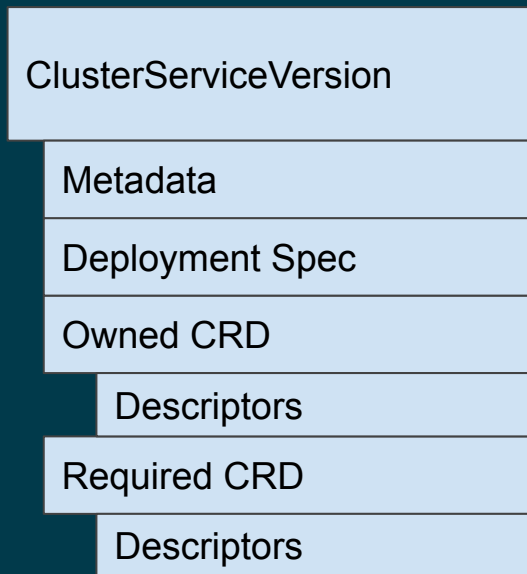
deb

rpm

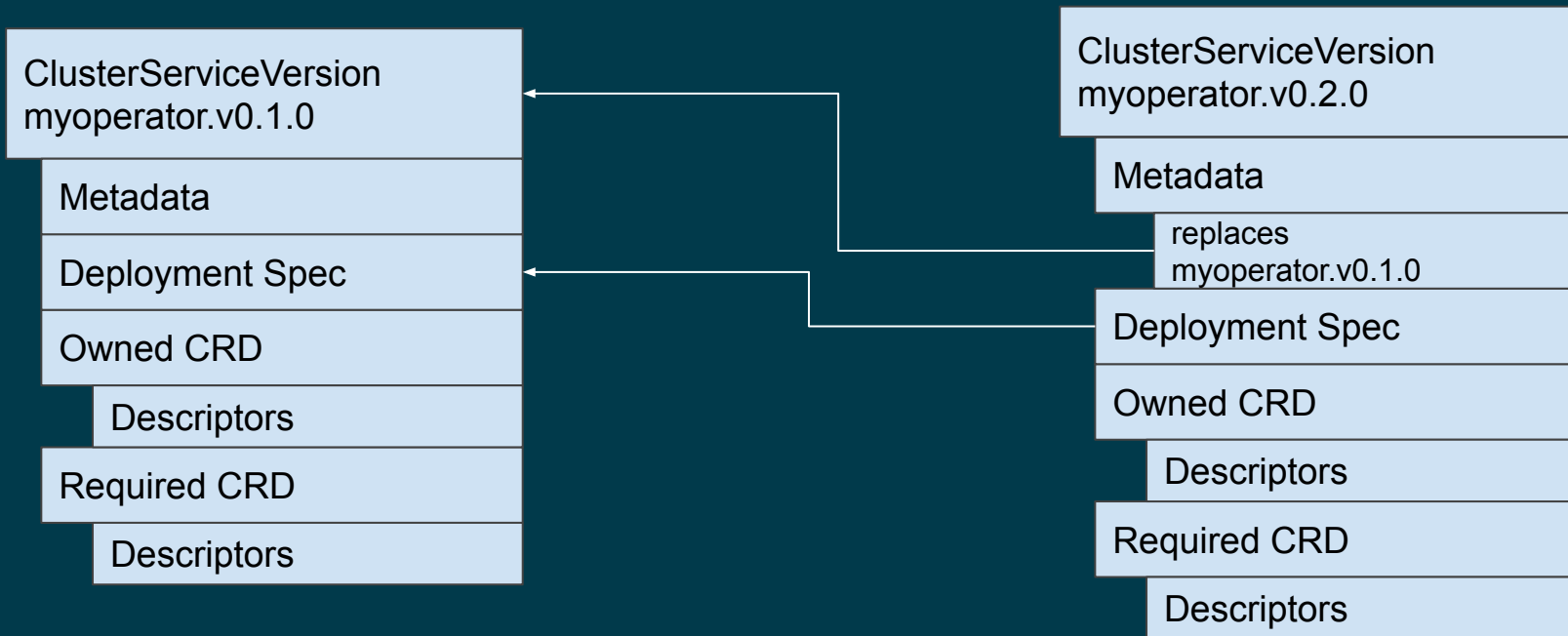
setup.py

formula

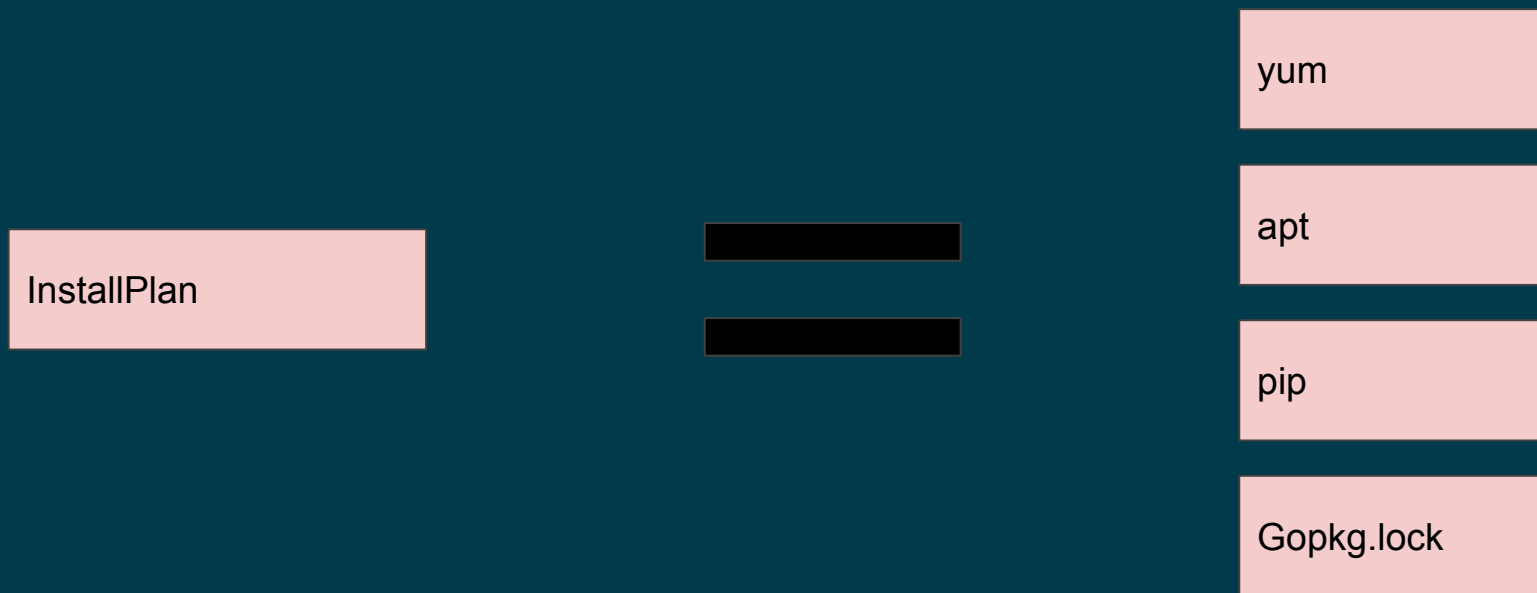
ClusterServiceVersion Manifest



Updating to a New CSV



InstallPlan is similar to a Package Manager



InstallPlan Manifest

InstallPlan

Desired CSVs

Status

Resolved CSVs

Resolved CRDs

InstallPlan Manifest

InstallPlan

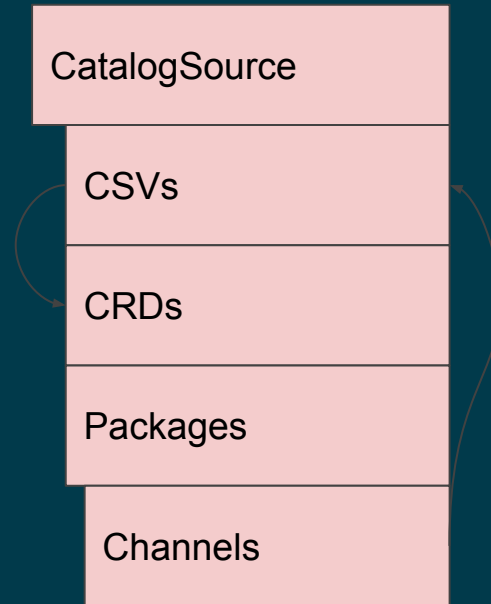
Desired CSVs

Status

Resolved CSVs

Resolved CRDs

Catalog Source Manifest



Subscription Manifest

Subscriptions

Package

CatalogSource



OLM OpenShift Environment

accounting

kube-system



openshift-operator-lifecycle-manager



sourceType: External

CatalogSource1
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

OLM-Operator

olm-operator-serviceaccount

Catalog-Operator

olm-operator-serviceaccount

sourceType: Internal

CatalogSource2
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

Package-Server

olm-operator-serviceaccount

ConfigMap

CRDs

Subscription

InstallPlan

CatalogSource

ClusterServiceVersion



Deploying an Operator via OLM

accounting

kube-system

openshift-operator-lifecycle-manager



Admin



User

ownerRef: ClusterServiceVersion

ServiceAccount
Name: contrail-operator
ownerRef: ClusterServiceVersion

Role
Name: contrailoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

RoleBinding
Name: contrailoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

contrail-operator (Deployment)
contrail-operator

Subscription
name: contrail
channel: stable
source CatalogSource2

ownerRef: Subscription

InstallPlan
clusterServiceVersion: contrail-operator.v0.9.0-0
Approval: Manual

ClusterServiceVersion
Juniper CONTRAIL

ConfigMap

sourceType: External

CatalogSource1
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversions...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

sourceType: Internal

CatalogSource2
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversions...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

OLM-Operator
olm-operator-serviceaccount

Catalog-Operator
olm-operator-serviceaccount

Package-Server
olm-operator-serviceaccount

CRDs

Subscription

InstallPlan

CatalogSource

ClusterServiceVersion

OperatorGroup

InfraVars

Add CRDs..

User Creates CR

kube-system



User



openshift-operator-lifecycle-manager

ownerRef: ClusterServiceVersion

kind: ServiceAccount
Name: contrail-operator

kind: Subscription
name: contrail
channel: stable
source CatalogSource2

Kind: InfraVars
name:
mycontrailexample
spec.CIDR:
192.168.0.0/24

ownerRef: ClusterServiceVersion
kind: Role
Name:
contrailoperator.v0.1.0-0

ownerRef: Subscription

kind: InstallPlan
clusterServiceVersionName
-contrail-operator.v0.1.0
Approval: Manual/Automatic

ownerRef: myInfra

contrail-DS

ownerRef: ClusterServiceVersion
Kind: RoleBinding
Name:
contrailoperator.v0.1.0-0

ownerRef: myetcdcluster

contrail-DS

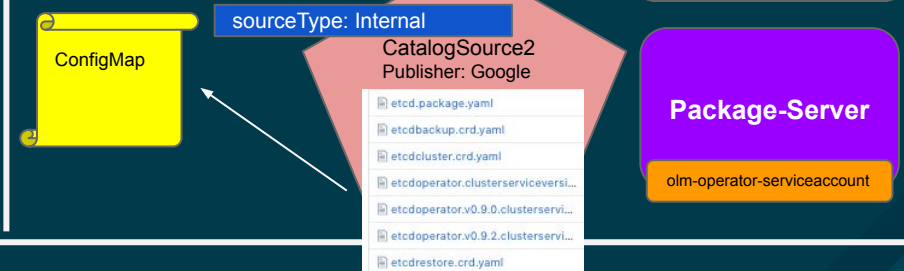
ownerRef: ClusterServiceVersion

Kind: Deployment
contrail-operator

etcd-operator

ownerRef: myetcdcluster

contrail-DS



CRDs

Subscription

InstallPlan

CatalogSource

ClusterServiceVersion

OperatorGroup

InfraVars

Add CRDs..

Updating CatalogSource



openshift-operator-lifecycle-manager

marketing



ownerRef: ClusterServiceVersion

kind: ServiceAccount
Name: etcd-operator

ownerRef: ClusterServiceVersion

kind: Role
Name:
etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: RoleBinding
Name:
etcdoperator.v0.9.0-0

ownerRef: ClusterServiceVersion

Kind: Deployment
etcd-Operator
etcd-operator

kind: Subscription
name: etcd
channel: alpha
source CatalogSource1

ownerRef: Subscription

kind: InstallPlan
clusterServiceVersionName
-etcd-operator.v0.9.0
Approval: Manual/Automatic

Kind: ClusterServiceVersion



ownerRef: Subscription
kind: InstallPlan
clusterServiceVersionName
-etcd-operator.v0.9.2
Approval: Manual/Automatic

Kind: etcdCluster
name: myetcdcluster
spec.node: 3

ownerRef: myetcdcluster

etcd-pod1

ownerRef: myetcdcluster

etcd-pod2

ownerRef: myetcdcluster

etcd-pod3

sourceType: External

CatalogSource1
Publisher: Red Hat

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

OLM-Operator
olm-operator-serviceaccount

Catalog-Operator
olm-operator-serviceaccount

ConfigMap

sourceType: Internal

CatalogSource2
Publisher: Google

- etcd.package.yaml
- etcdbackup.crd.yaml
- etcdcluster.crd.yaml
- etcdoperator.clusterserviceversi...
- etcdoperator.v0.9.0.clusterservi...
- etcdoperator.v0.9.2.clusterservi...
- etcdrestore.crd.yaml

Package-Server
olm-operator-serviceaccount

currentCSV: etcdoperator.v0.9.2

CRDs

- Subscription
- InstallPlan
- CatalogSource
- ClusterServiceVersion
- EtcdClusters
- EtcdBackups
- EtcdRestore