



OpenTour

Conectando personas y soluciones
para acelerar tu negocio

Madrid

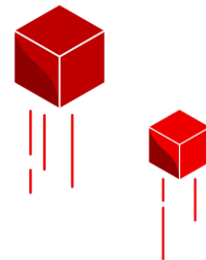
18 de mayo de 2023



Gestiona y estandariza tus despliegues con GitOps en la Hybrid Cloud

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EMEA Cloud Services Black Belt



Objetivo
Desplegar mis
aplicaciones en entornos
Hybrid Cloud

Conoceís los OpenShift Cloud Services?

Red Hat OpenShift Everywhere

A consistent platform no matter how or where you run

Managed Red Hat OpenShift services

Start quickly, we manage it for you



Red Hat OpenShift
Service on AWS



Azure Red Hat
OpenShift



IBM Cloud
Red Hat OpenShift
on
IBM Cloud¹



Google Cloud



Red Hat OpenShift
Dedicated

Self-managed Red Hat OpenShift

You manage it, for control and flexibility



Red Hat
OpenShift
Container Platform

On public cloud, or on-
premises on
physical or virtual
infrastructure³

Red Hat OpenShift cloud services reduce operational complexity so you can **focus** on quickly building and scaling applications **consistently** in any cloud.

Deploy applications 3x faster

Reduce operational costs by 60%

25x new deployments per week

Managed cloud services accelerate your business quickly



Adopting new technologies

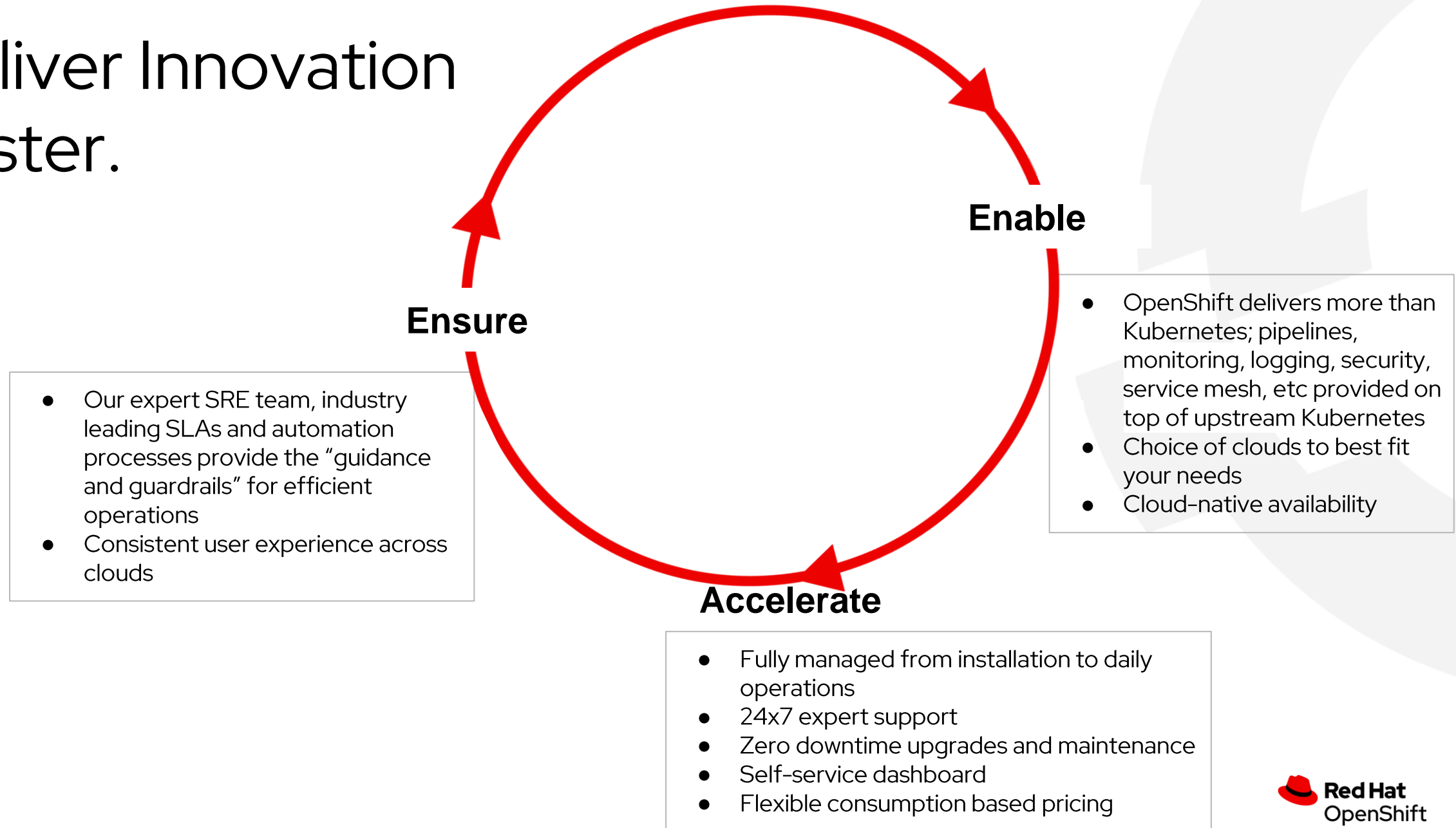


Faster time to market



Adapting to changing business demands

Deliver Innovation Faster.



OpenShift Cloud Services como Open Hybrid Cloud

Developer Efficiency

Business Productivity

Enterprise Ready

Red Hat OpenShift Everywhere



Joint offerings with Cloud Provider

Red Hat Managed

OCP Customer Managed

Offered as a Native Console offering on equal parity with cloud provider
Kubernetes service

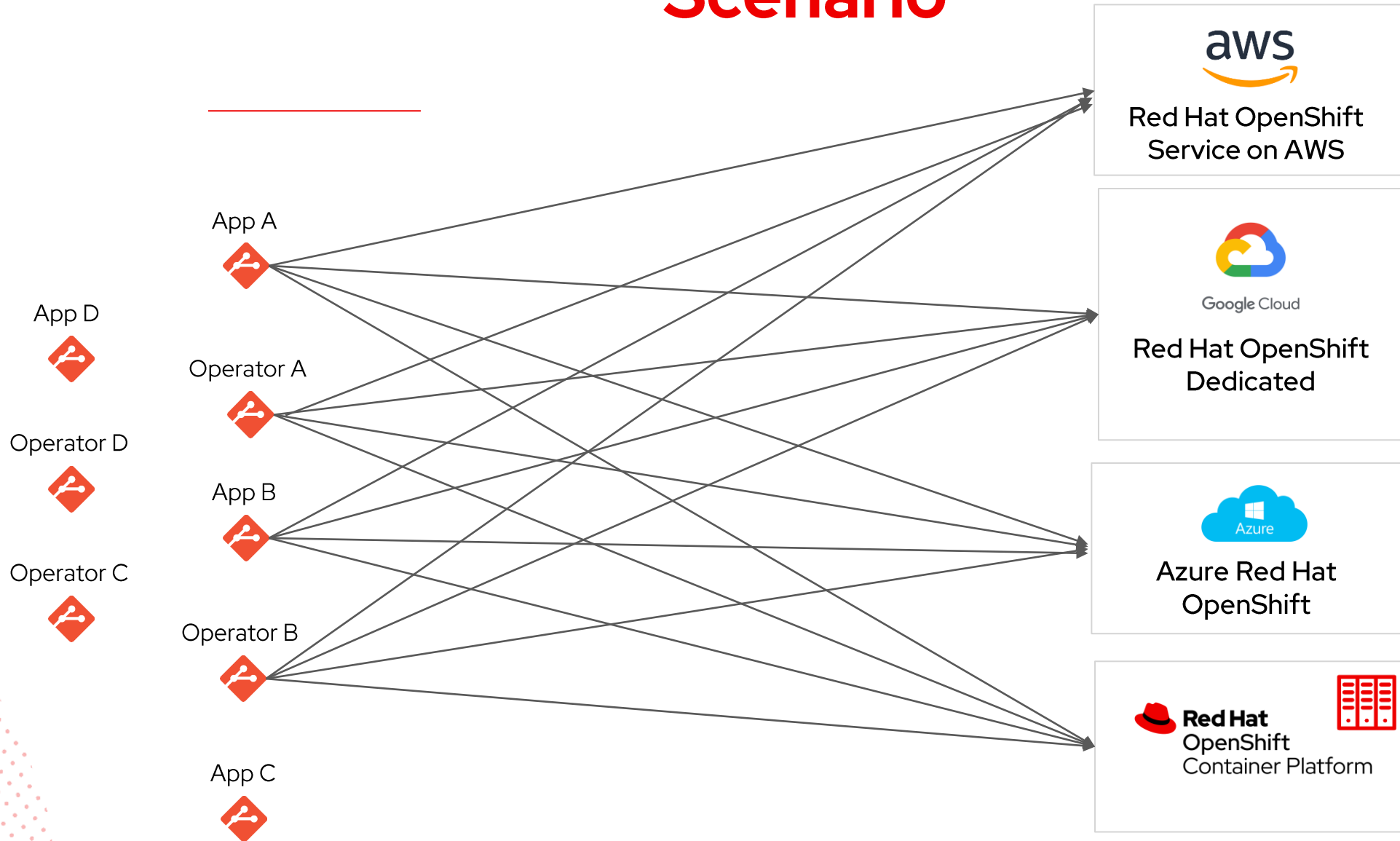
or

OCP Customer Managed



Objetivo Desplegar mis aplicaciones en entornos Hybrid Cloud

Scenario





GitOps

What is GitOps?

A developer-centric approach to Continuous Delivery and infrastructure operation



Treat
everything as
code



Git is the
single source
of truth



Auto-reconcile
ops through
Git workflows

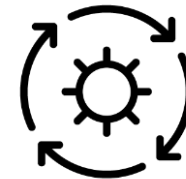
GitOps Principles



The system is described declaratively



The desired state is versioned in Git



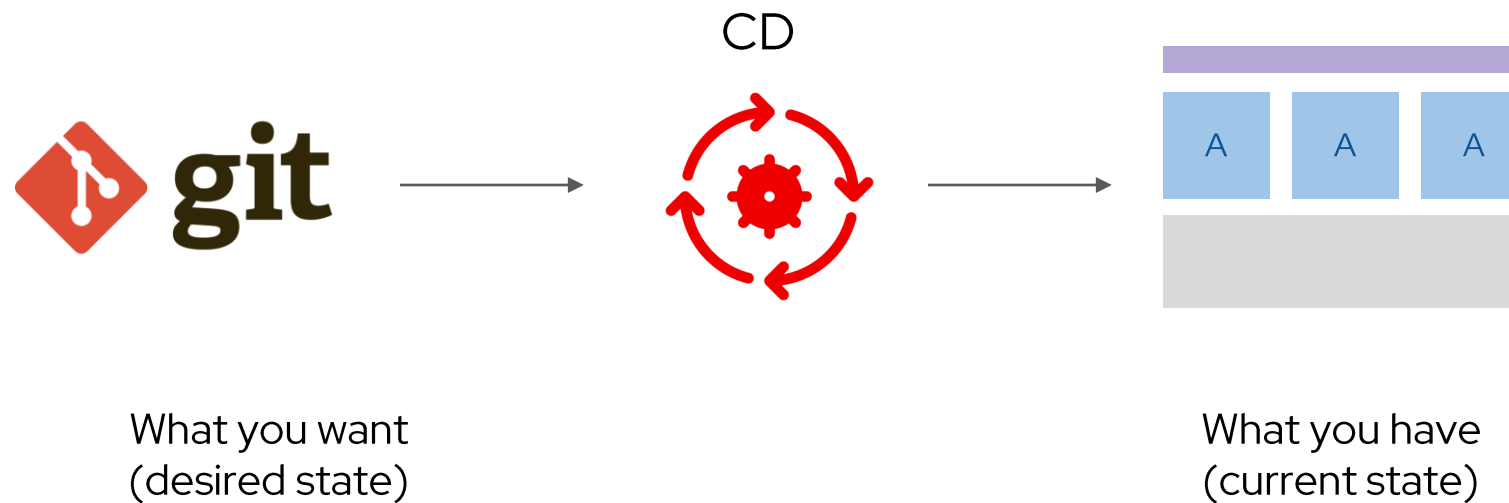
Approved changes can be applied automatically



A controller exists to detect and act on drift

GitOps Workflow

a declarative approach to application delivery



Why GitOps?

Standard Workflow

Familiar tools and Git workflows from application development teams

Enhanced Security

Review changes beforehand, detect configuration drifts, and take action

Visibility and Audit

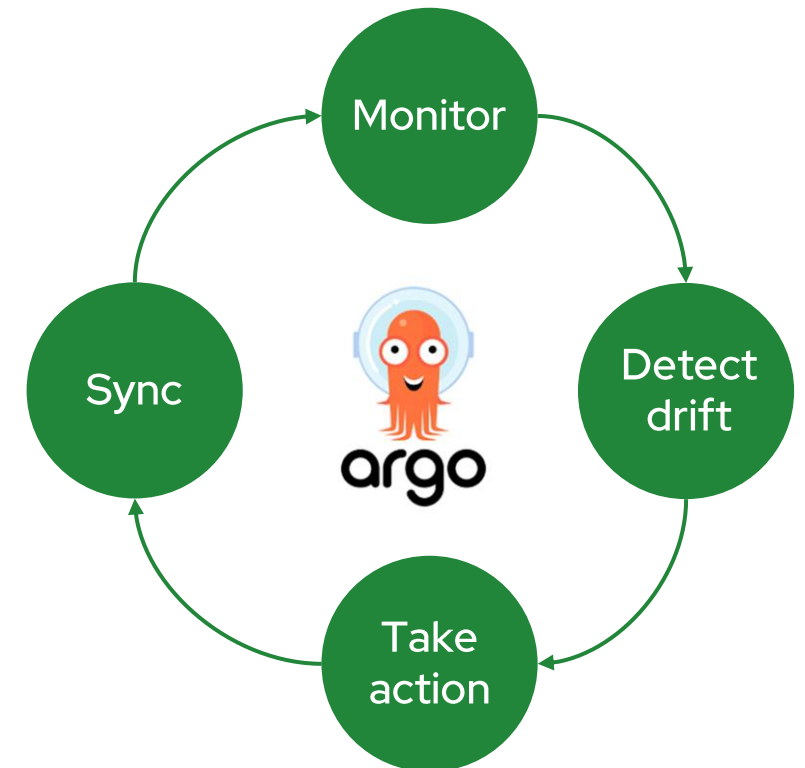
Capturing and tracing any change to clusters through Git history

Multi-cluster consistency

Reliably and consistently configure multiple Kubernetes clusters and deployment

Argo CD

- Cluster and application configuration versioned in Git
- Automatically syncs configuration from Git to clusters
- Drift detection, visualization and correction
- Granular control over sync order for complex rollouts
- Rollback and rollforward to any Git commit
- Manifest templating support (Helm, Kustomize, etc)
- Visual insight into sync status and history



OpenShift GitOps

OpenShift GitOps



Multi-cluster config management

Declaratively manage cluster and application configurations across multi-cluster OpenShift and Kubernetes infrastructure with Argo CD



Automated Argo CD install and upgrade

Automated install, configurations and upgrade of Argo CD through OperatorHub



Opinionated GitOps bootstrapping

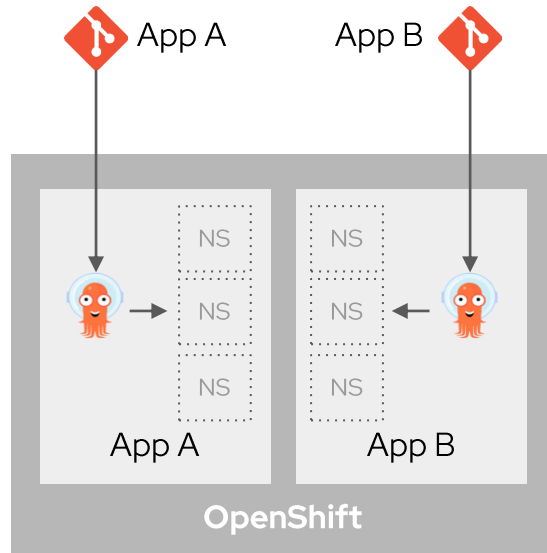
Bootstrap end-to-end GitOps workflows for application delivery using Argo CD and Tekton with GitOps Application Manager CLI



Deployments and environments insights

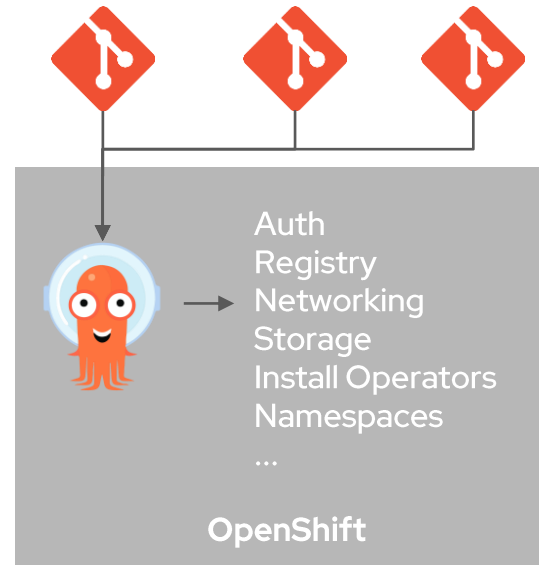
Visibility into application deployments across environments and the history of deployments in the OpenShift Console

Flexible Deployment Strategies



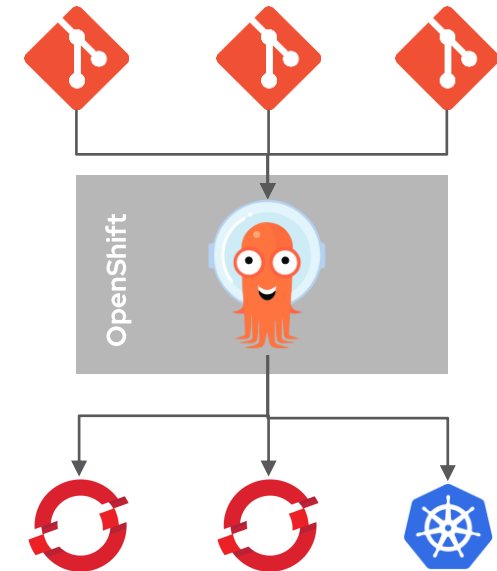
Application Scoped (Pull)

An **application scoped Argo CD** pulls application deployment and configurations into app namespaces



Cluster Scoped (Pull)

A **cluster-scope Argo CD** pulls cluster service configurations into into the OpenShift cluster



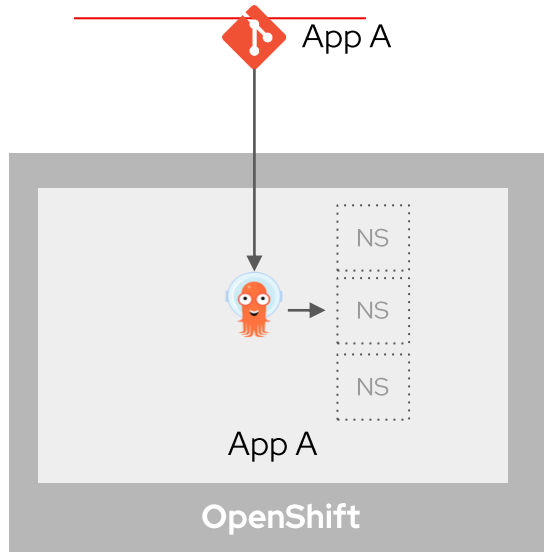
Central Hub (Push)

A **central Argo CD** pushes Git repository content to remote OpenShift and Kubernetes clusters

Argo CD Application

- Argo CD applications, projects and settings can be defined declaratively using Kubernetes manifests.
- **Source** reference to the desired state in Git (repository, revision, path, environment)
- **Destination** reference to the target cluster and namespace.
- SyncPolicy - automatically sync an application when it detects differences between the desired manifests in Git, and the live state in the cluster.

```
apiVersion: argoproj.io/v1alpha1
kind: Application
metadata:
  name: bgd-app
  namespace: openshift-gitops
spec:
  destination:
    namespace: bgd
    server: https://kubernetes.default.svc
  project: default
  source:
    path: apps/bgd/overlays/bgd
    repoURL: https://github.com/RedHat-EMEA-SSA-Team/ns-apps
    targetRevision: single-app
  syncPolicy:
    automated:
      prune: true
      selfHeal: true
    syncOptions:
      - CreateNamespace=true
```



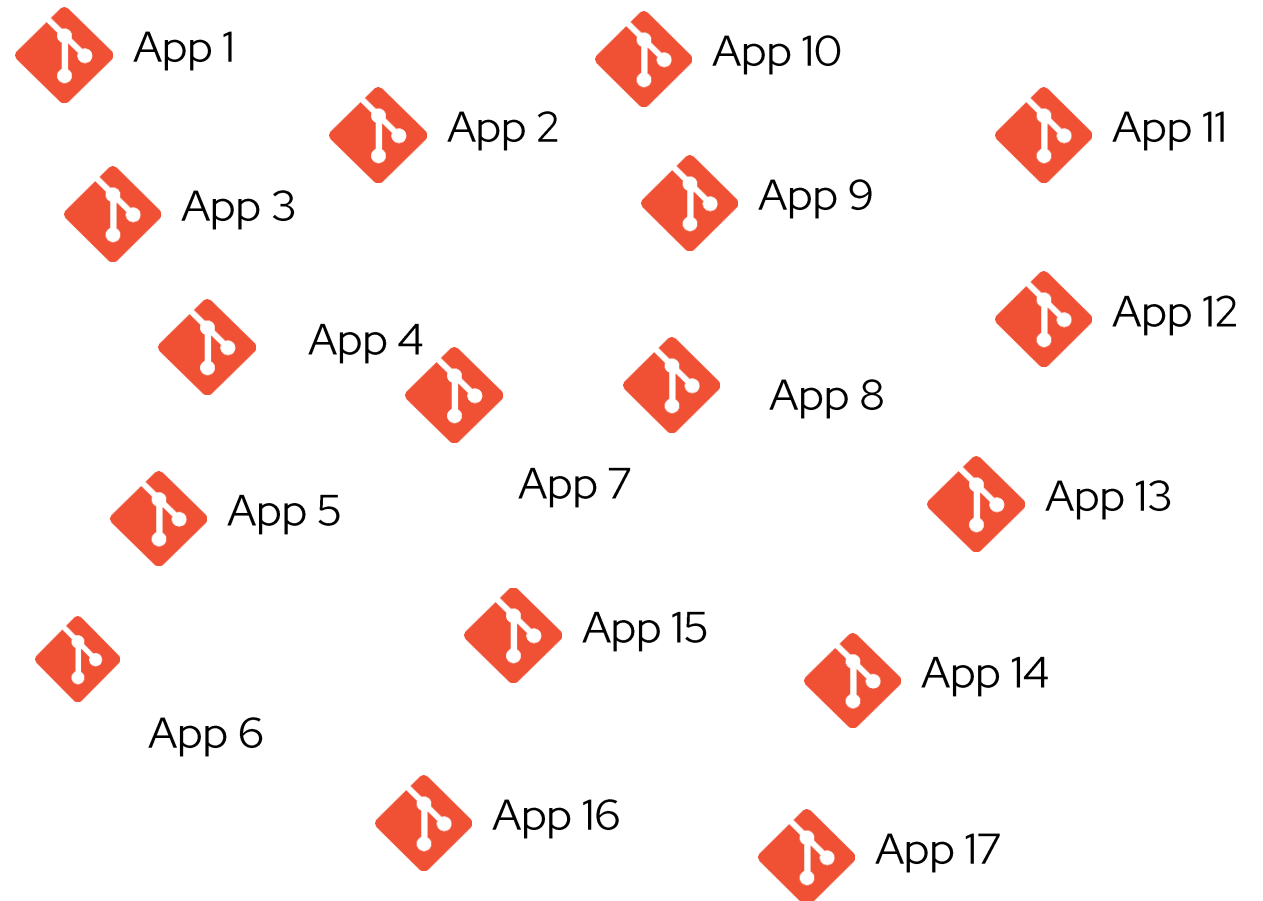
Demo 1 - OpenShift GitOps deploy an App

Application Scoped (Pull)



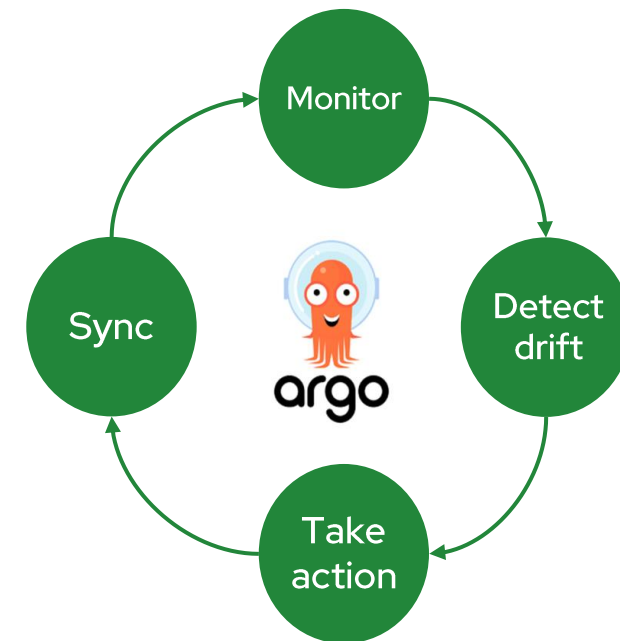
On-prem

Pero... y ahora como
puedo desplegar
múltiples aplicaciones a
la vez?



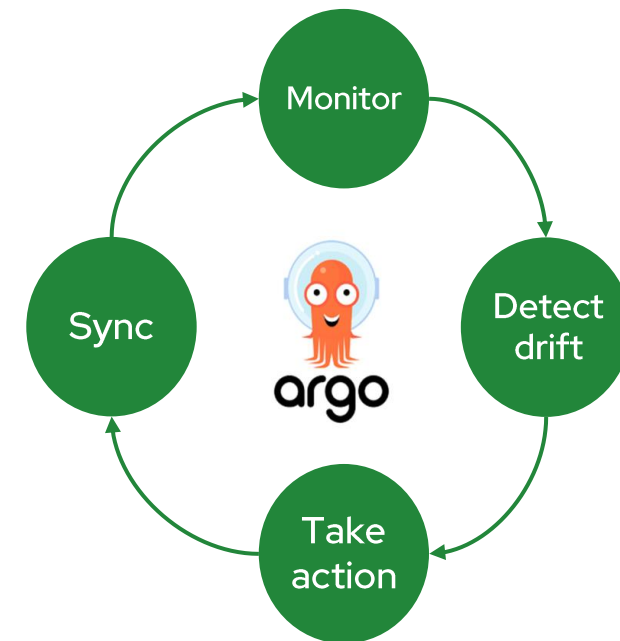
Argo CD ApplicationSet

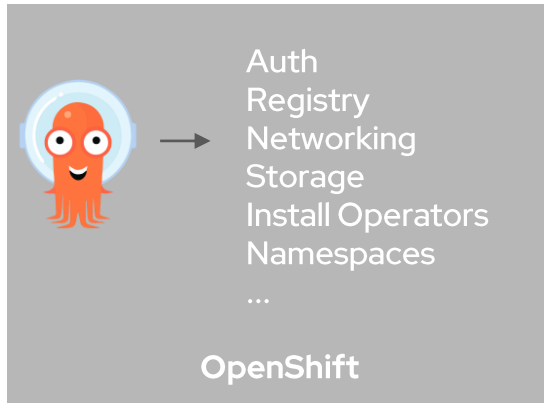
- Use a single Kubernetes manifest to **target multiple Kubernetes clusters** with Argo CD
- Use a single Kubernetes manifest to **deploy multiple applications from one or multiple Git repositories** with Argo CD
- Improved support for monorepos: **multiple Argo CD Application resources defined within a single Git repository**
- Within multitenant clusters, **improves the ability of individual cluster tenants to deploy applications** using Argo CD



Argo CD ApplicationSet Generators

- **List generator:** Generates parameters based on a fixed list of cluster name/URL values.
- **Cluster generator:** Automatically generates cluster parameters based on the clusters that are defined within Argo CD.
- **Git generator:** Generates parameters based on files or folders that are contained within the Git repository defined within the generator resource.
- **Matrix generator:** Combines the generated parameters of two other generators.





Demo 2 - OpenShift GitOps deploy App using AppSet

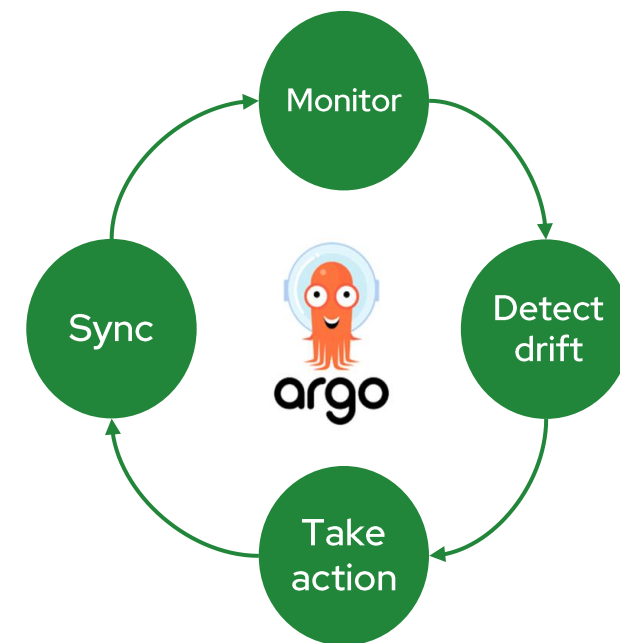
Cluster Scoped (Pull)



On-prem

Argo CD ApplicationSet Generators - Cluster Generator

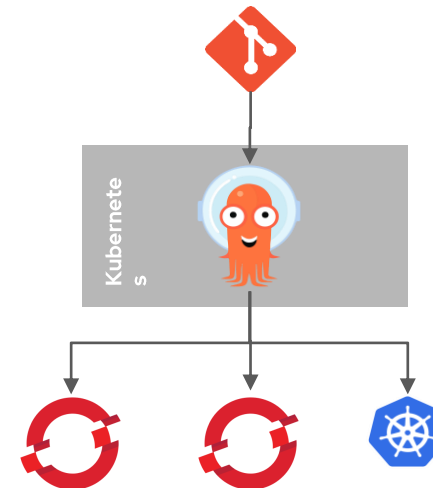
- **List generator:** Generates parameters based on a fixed list of cluster name/URL values, as seen in the example above.
- **Cluster generator:** Automatically generates cluster parameters based on the clusters that are defined within Argo CD.
- **Git generator:** Generates parameters based on files or folders that are contained within the Git repository defined within the generator resource.
- **Matrix generator:** Combines the generated parameters of two other generators.



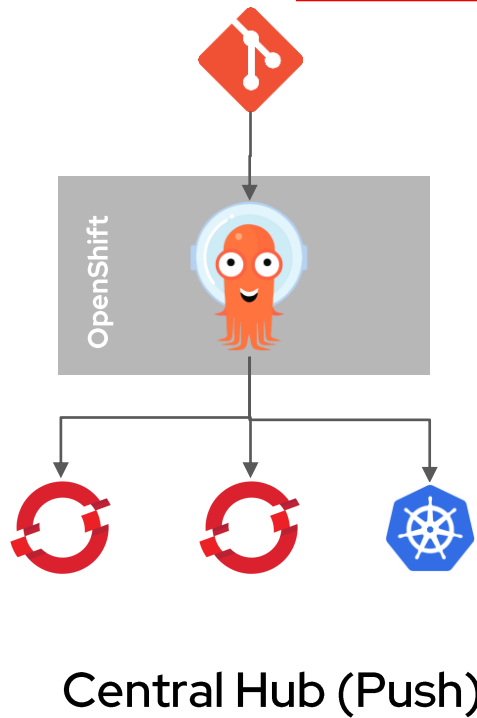
Argo CD ApplicationSet Generators - Cluster Generator

```

apiVersion: argoproj.io/v1alpha1
kind: ApplicationSet
metadata:
  name: welcome-app-appset
  namespace: openshift-gitops
spec:
  generators:
  - clusters: {}
  template:
    metadata:
      name: "{{name}}-welcome-app"
    spec:
      project: default
      syncPolicy:
        automated:
          prune: true
          selfHeal: true
      source:
        repoURL: https://github.com/RedHat-EMEA-SSA-Team/ns-apps
        targetRevision: multicluster
        path: cluster-generator/base/
      destination:
        server: "{{server}}"
        namespace: welcome-app
  
```



Demo 3 - OpenShift GitOps deploy App using AppSet In Multiple Clusters



ACM GitOps

GitOps in ACM, how does it

Channel - Source work?

```

apiVersion: apps.open-cluster-management.io/v1
kind: Channel
metadata:
  name: etherpad-app-latest
  namespace: etherpad
spec:
  type: GitHub
  pathname: https://github.com/ocp-tigers/rhacm-demo.git

```

Subscription - What

```

1  apiVersion: apps.open-cluster-management.io/v1
2  kind: Subscription
3  metadata:
4    name: etherpad-app
5    namespace: etherpad
6    labels:
7      app: etherpad-app
8  annotations:
9    apps.open-cluster-management.io/git-path: app-lifecycle/etherpad
10   apps.open-cluster-management.io/git-branch: main
11 spec:
12   channel: etherpad/etherpad-app-latest
13   placement:
14     placementRef:
15       kind: PlacementRule
16       name: etherpad-pr

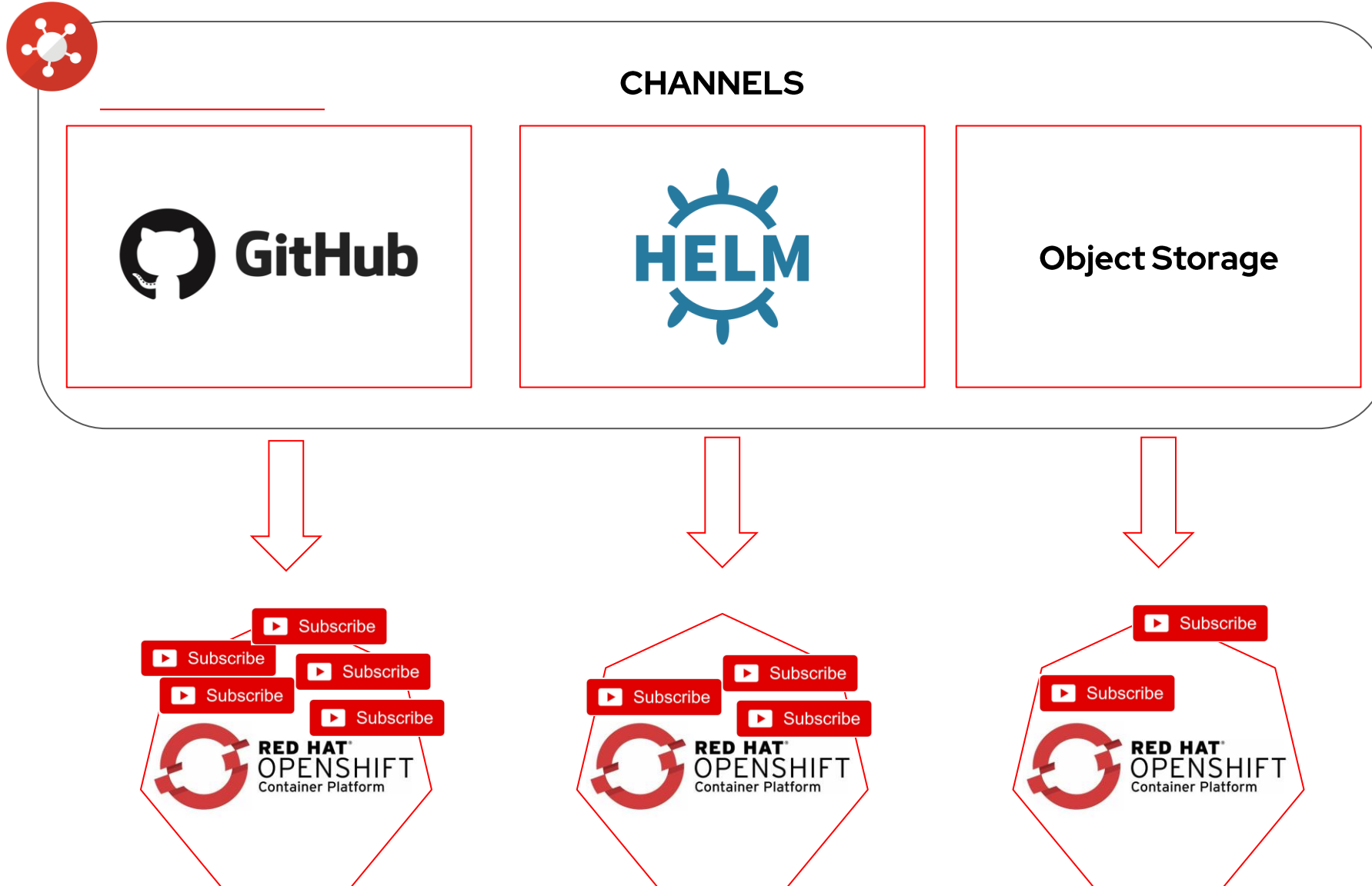
```

Placement Rule - Where

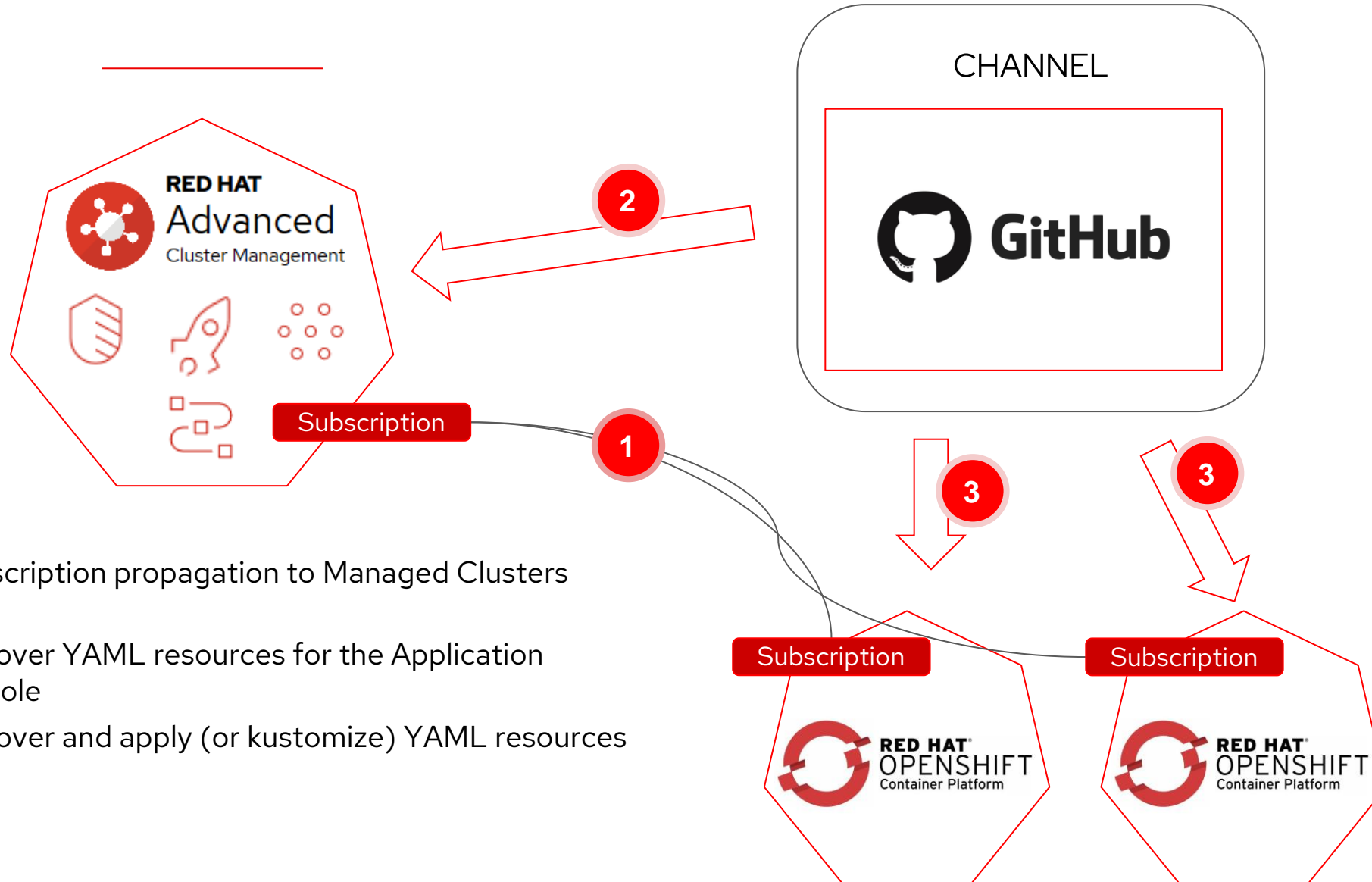
```

1  apiVersion: apps.open-cluster-management.io/v1
2  kind: PlacementRule
3  metadata:
4    name: etherpad-pr
5    namespace: etherpad
6    labels:
7      app: etherpad-app
8  spec:
9    clusterReplicas: 1
10   clusterConditions:
11     - type: ManagedClusterConditionAvailable
12       status: "True"
13   clusterSelector:
14     matchLabels:
15       environment: dev

```

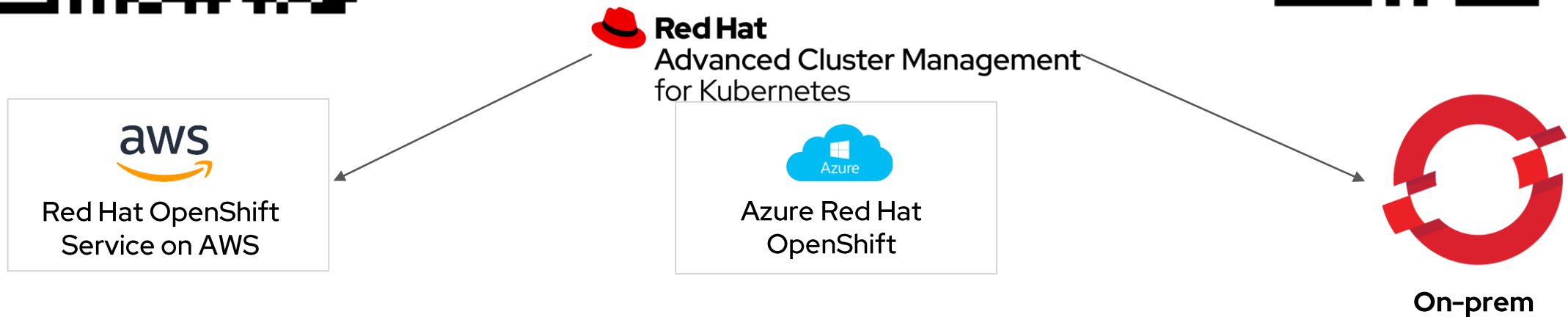
Remote subscription flows



- 1 Subscription propagation to Managed Clusters
- 2 Discover YAML resources for the Application console
- 3 Discover and apply (or kustomize) YAML resources

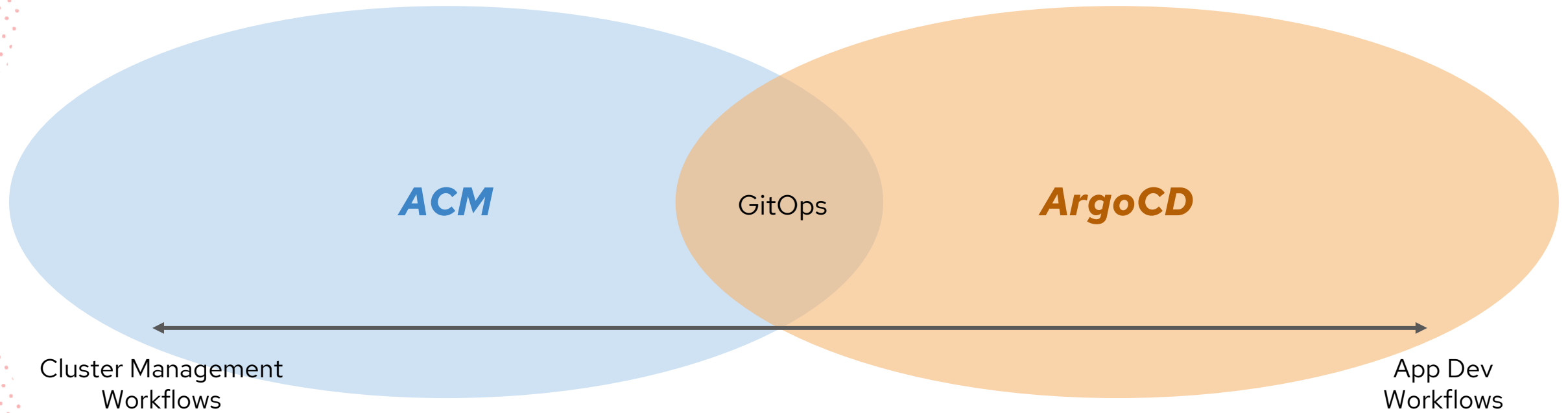


Demo 4 - ACM GitOps deploy App



ACM + OpenShift GitOps = 

ACM + ArgoCD



OpenShift Gitops support in Red Hat Advanced Cluster Management



Red Hat
Advanced Cluster
Management
for Kubernetes



- **Advanced Cluster Management**, can view applications provisioned by a local **ArgoCD** on the hub cluster as well as display applications provisioned on managed-cluster by **ArgoCD** installed on the managed-clusters.
- **Advanced Cluster Management** supports importing managed clusters into one or more **ArgoCD's**.

ACM & ArgoCD side by side

Red Hat Advanced Cluster Management, integrates both management tools, giving you more options, control and capabilities for your GitOps strategy

The screenshot shows the 'Applications' page in the Red Hat ACM console. The page includes a search bar, a table of application instances, and a 'Create application' button. The table columns are Name, Namespace, Clusters, Resource, Time window, and Created. The table contains 8 rows of application instances, including 'cloud-provider-quota-check', 'helloworld', 'infrastructure-buildout', 'mortgage', 'nginx-sample', 'pacman-sample', 'remote-argo-app', and 'remote-argo-nginx'. Some instances are managed by Argo, as indicated by the 'Argo' badge.

Name	Namespace	Clusters	Resource	Time window	Created
cloud-provider-quota-check	Argo openshift-gitops	local-cluster	Git		5 hours ago
helloworld	helloworld	7 Remote	Git (2)		10 hours ago
infrastructure-buildout	seeds	Local	Git		10 hours ago
mortgage	mortgage	1 Remote	Git (2)		4 hours ago
> nginx-sample	Argo app set (8)	7 Remote, 1 Local	Git		
> pacman-sample	Argo app set (2)	2 Remote	Git		
remote-argo-app	hub-config	7 Remote	Git (2)		10 hours ago
> remote-argo-nginx	Argo (7)	7 Remote	Git		

Displaying ArgoCD Apps in ACM Application console

remote-argo-nginx		Argo (7)	7 Remote	Git
remote-argo-nginx	Remote	openshift-gitops	jnp-vmware	10 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-01-aws	10 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-01-azure	10 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-01-gcp	9 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-02-aws	10 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-02-azure	8 hours ago
remote-argo-nginx	Remote	openshift-gitops	jnp480-fc4-02-gcp	9 hours ago

1 - 8 of 8 << < 1 of 1 > >>

- Advanced Cluster Management, displays your ArgoCD applications, whether they were deployed from ArgoCD on the hub, or from ArgoCD's running on the Managed Clusters.
- Each application shown in the list was deployed by a distinct ArgoCD running on a remote cluster.

ArgoCD applications at scale

Advanced Cluster Management, helps you interact with your ArgoCD applications at scale. Using a topology approach, Advanced Cluster Management groups applications that use the same source together, so that you can view the health and status of your application across your entire cluster fleet in a single view.

If one or more resources have an issue on any of your clusters, this will be easily visible, and with a single click, the cluster where the problem is occurring will be identifiable, whether you have 1 cluster or 1000 clusters



▼	nginx-in-cluster	📘 Argo (3)	2 Remote, 1 Local	🔗 Git
	nginx-in-cluster	nginx-sample	local-cluster	
	nginx-jnp-vmware	nginx-sample	jnp-vmware	
	nginx-jnp478-aws	nginx-sample	jnp478-aws	

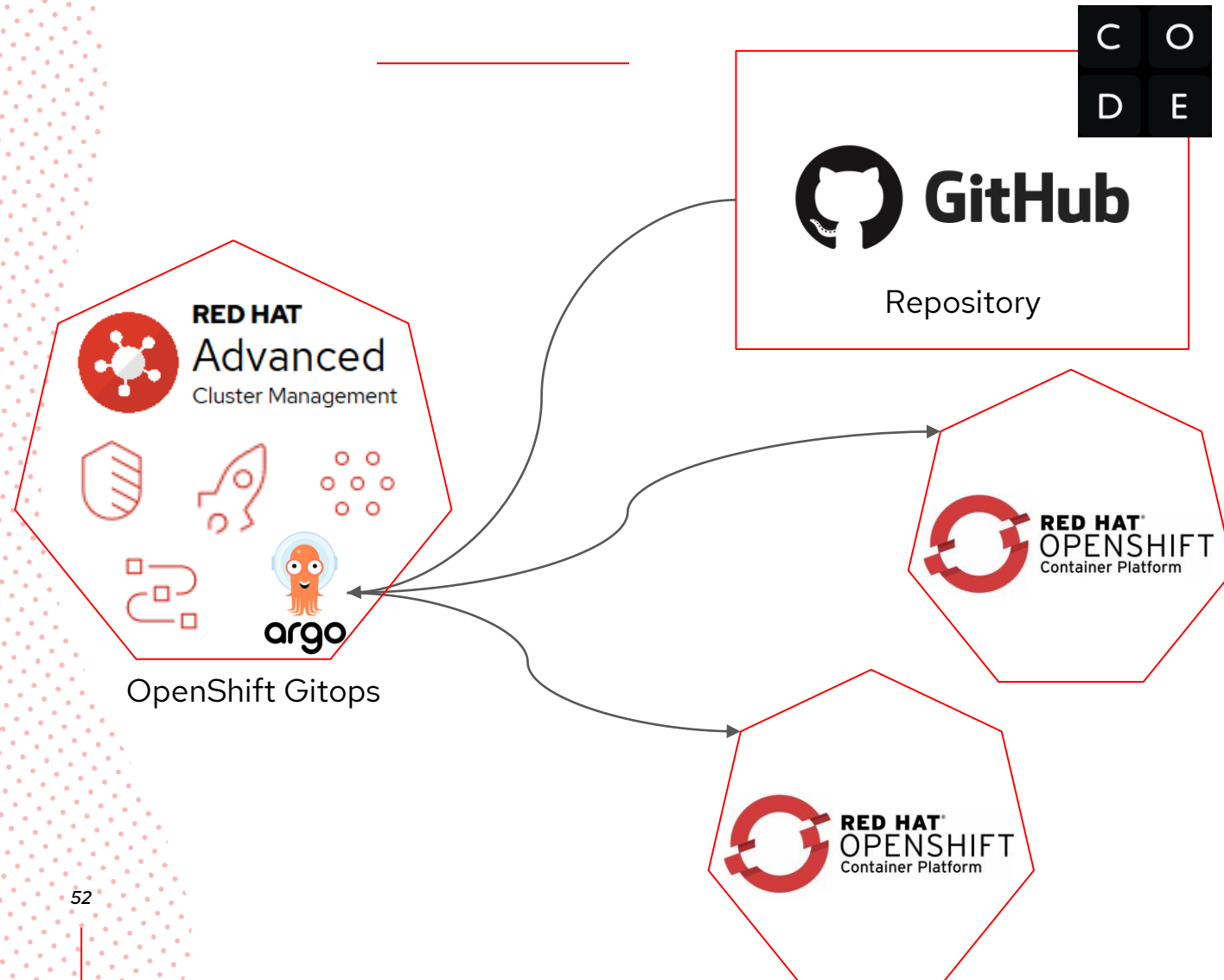
Demo - Displaying ArgoCD Apps in ACM Application console

The screenshot shows the ACM Application console interface. At the top, there's a navigation bar with the Red Hat logo and 'Advanced Cluster Management for Kubernetes'. The main header is 'Applications' with a 'Refresh every 15s' button and 'Last update: 9:19:48 PM'. Below the header, there are tabs for 'Overview' and 'Advanced configuration', and a 'Create application' button.

The main content area displays a table of applications with the following columns: Name, Namespace, Clusters, Resource, Time window, and Created. The table lists several applications, including 'cloud-provider-quota-check', 'helloworld', 'infrastructure-buildout', 'mortgage', 'nginx-sample', 'pacman-sample', 'remote-argo-app', and 'remote-argo-nginx'. Some applications have 'Argo' labels indicating they are managed by ArgoCD.

Name	Namespace	Clusters	Resource	Time window	Created
cloud-provider-quota-check	Argo openshift-gitops	local-cluster	Git		5 hours ago
helloworld	helloworld	7 Remote	Git (2)		10 hours ago
infrastructure-buildout	seeds	Local	Git		10 hours ago
mortgage	mortgage	1 Remote	Git (2)		4 hours ago
> nginx-sample	Argo app set (8)	7 Remote, 1 Local	Git		
> pacman-sample	Argo app set (2)	2 Remote	Git		
remote-argo-app	hub-config	7 Remote	Git (2)		10 hours ago
> remote-argo-nginx	Argo (7)	7 Remote	Git		

Deploy / Push Applications using ACM & OpenShift GitOps



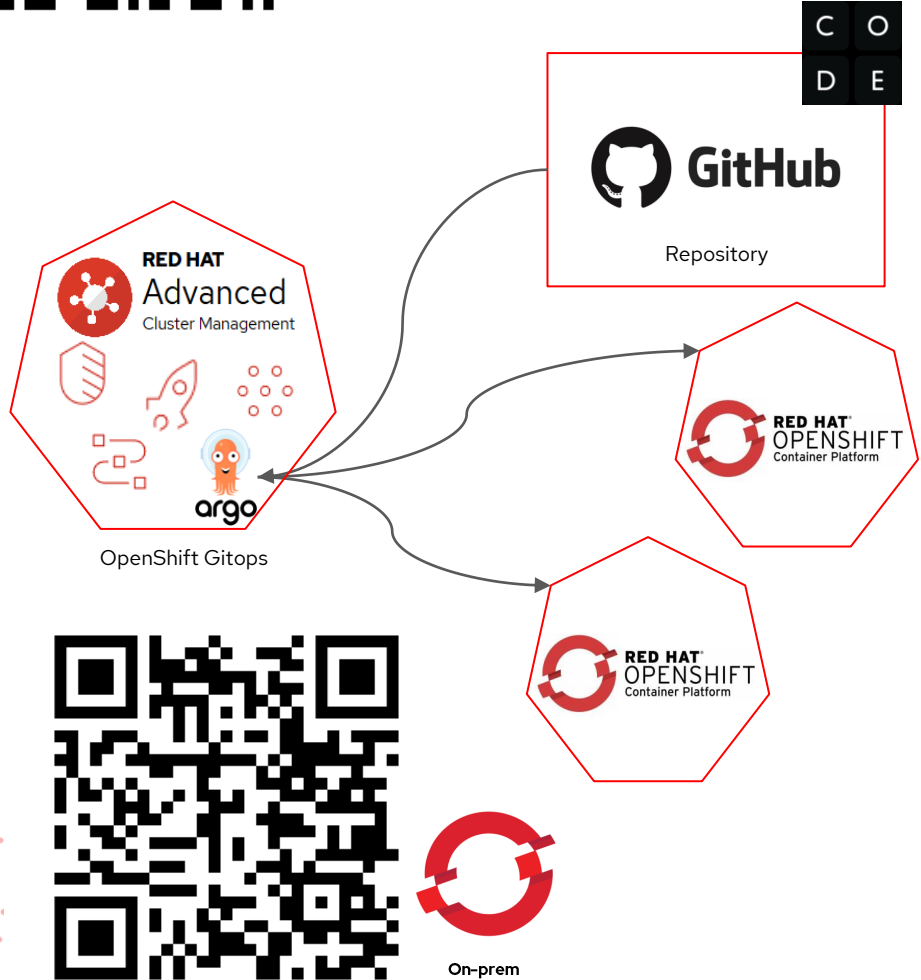
Red Hat Advanced Cluster Management for Kubernetes

Applications

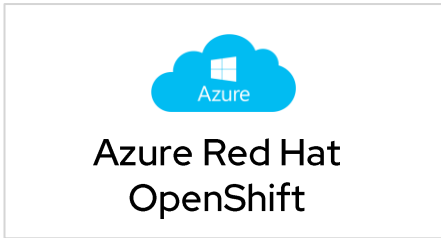
Overview | Advanced configuration

Search

Name	Namespace	Clusters	Resource
cloud-provider-quota-check	Argo openshift-gitops	local-cluster	Git
helloworld	helloworld	5 Remote	Git (2)
infrastructure-buildout	seeds	Local	Git
mortgage	mortgage	1 Remote	Git (2)
> nginx-sample	Argo app set (7)	5 Remote, 1 Local	Git
remote-argo-app	hub-config	5 Remote	Git (2)
> remote-argo-nginx	Argo (5)	5 Remote	Git



Demo - ACM and OpenShift GitOps side by side deploying App in Multi Clustering scenarios




Q/A

References


- <https://github.com/jnpacker/gitops-fleet-samples>
- <https://www.redhat.com/architect/kubernetes-multicluster-applications-gitops>
- <https://github.com/stolostron/application-samples>
- <https://github.com/RedHat-EMEA-SSA-Team/ns-gitops>
- <https://github.com/RedHat-EMEA-SSA-Team/ns-apps/tree/appsets/apps>
- <https://rcarrata.com/openshift/argo-and-acm/>
- <https://github.com/noseka1/multicluster-management-rhacm-argocd>

Muchas gracias


Red Hat es el principal proveedor mundial de soluciones empresariales de código abierto con un enfoque impulsado por la comunidad que permite ofrecer tecnologías de alto rendimiento de Linux, nube, contenedor y Kubernetes. Le ayudamos a estandarizar en todos los entornos, a desarrollar aplicaciones nativas de la nube, a integrar, automatizar, asegurar y gestionar entornos complejos gracias al soporte, training y servicios de consultoría galardonados.

 [linkedin.com/company/red-hat](https://www.linkedin.com/company/red-hat)

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