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# Demystifying Helm Support In Argo CD



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# Agenda



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- Argo CD Overview
- Config Management Tools Support
- Helm First Class Support:
  - Automatic dependencies resolving
  - User interface
  - Dynamic parameters
  - Helm Hooks
- Helm Repositories
- Simple Demo
- Practical Helm charts usage
  - Umbrella Helm charts
  - Multiple sources and source references
- Real Life Demo

# What Does Argo CD Do?

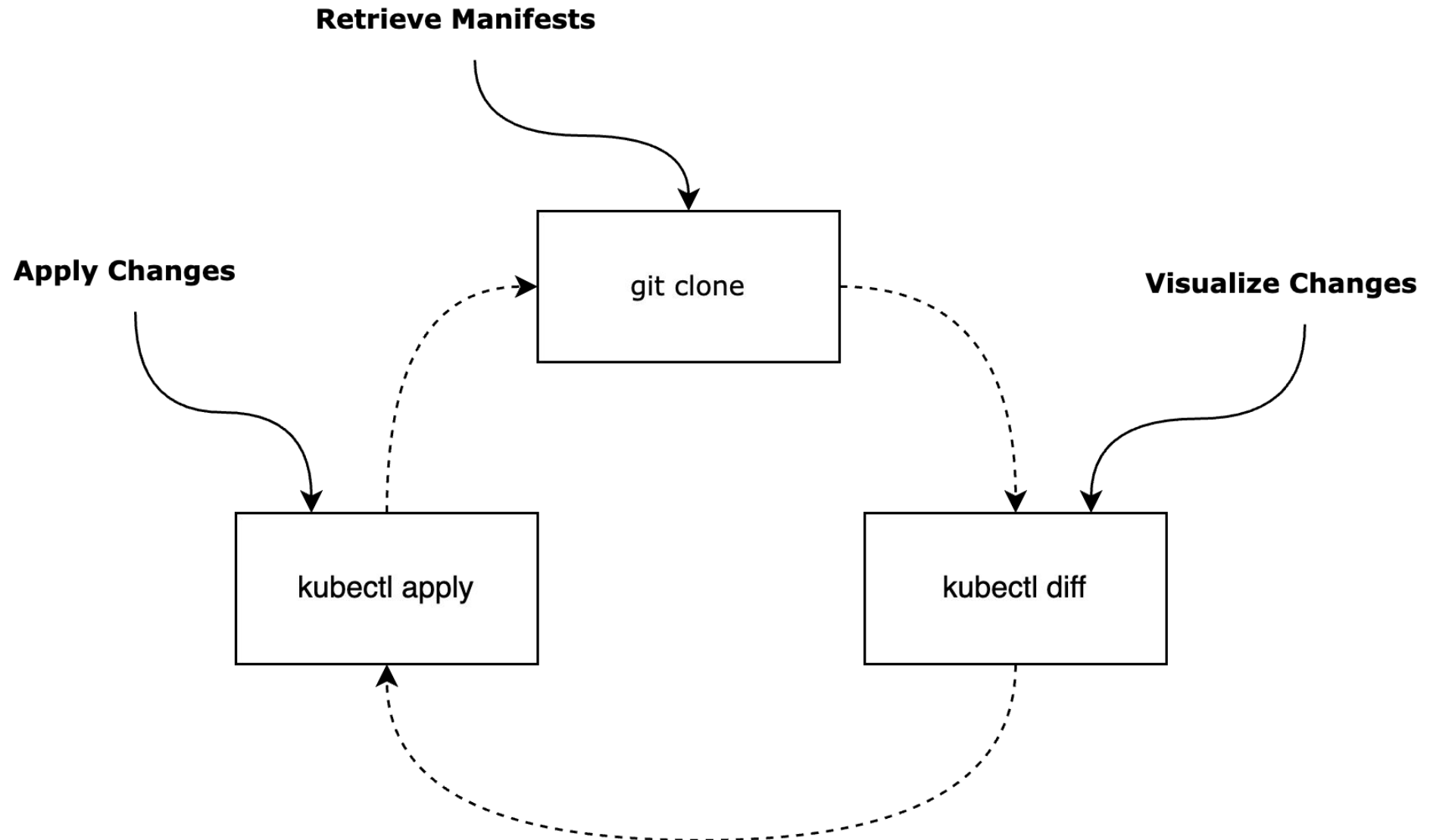


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# What Does Argo CD Do?

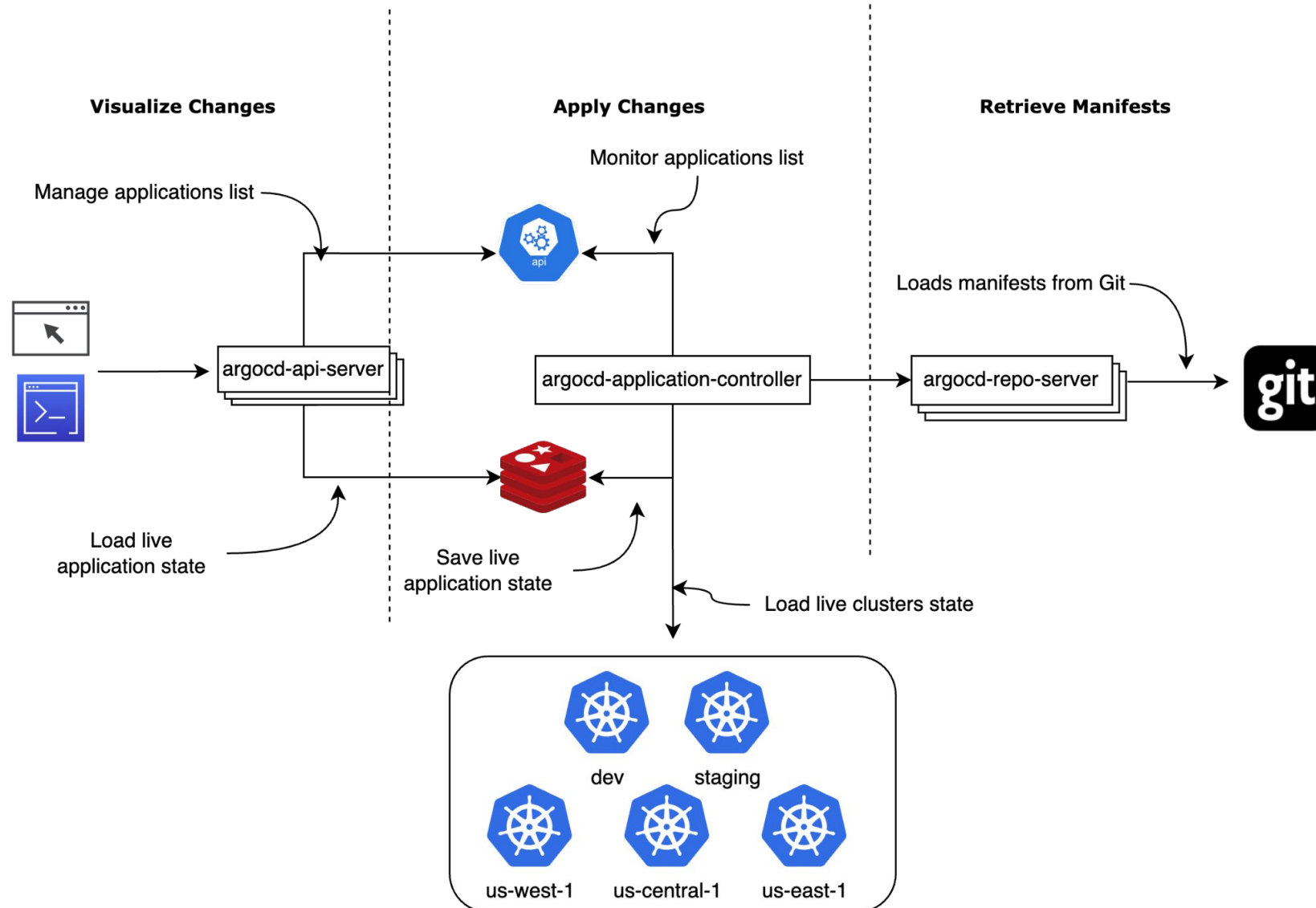


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# Config Management Tools



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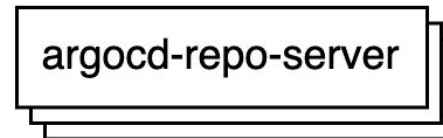
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- Various repositories (git; helm https/oci)
- Various config management tools
- Out-of-the-box support of Helm, Kustomize, Jsonnet
- Plugins for any other tool: Tanka, Helmfile

## Retrieve Manifests

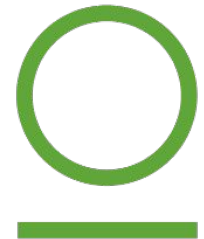
Loads manifests from Git



- Fetch configuration files
- Detect config management tool
- Apply dynamic parameters
- Generate manifests



git



artifactory (oci/https)



harbor (oci/https)

# Helm Support: deployment



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- Helm is used for YAML generation only
- Behind the scene it is *helm template* . / *kubectl apply -f* - instead of *helm install*
- *argocd app list* is instead of *helm ls*

```
$ helm install my-release oci://ghcr.io/nginxinc/charts/nginx-ingress --version 1.0.1 --namespace nginx
$ helm ls
```

NAME	NAMESPACE	REVISION	UPDATED	STATUS	CHART	APP VERSION
my-release	nginx	1	2023-10-31 13:51:20.617362 -0700 PDT	deployed	nginx-ingress-1.0.1	3.3.1

**VS**

```
$ argocd app create my-app --repo ghcr.io/nginxinc/charts --helm-chart nginx-ingress --dest-name in-cluster --dest-namespace nginx --revision 1.0.1
application 'my-app' created
```

```
$ argocd app list
```

NAME	CLUSTER	NAMESPACE	PROJECT	STATUS	HEALTH	SYNCPOLICY	CONDITIONS	REPO	PATH	TARGET
argocd/my-app	in-cluster	nginx	default	OutOfSync	Missing	<none>		ghcr.io/nginxinc/charts		1.0.1



# Helm Support: dependencies & hooks



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- Chart dependencies are pulled automatically
- Offline mode is supported: deployment won't fail if dependencies are committed to Git
- Most of Helm hooks are supported: automatically translated to equivalent Argo CD hooks

Helm Annotation	Notes
<code>helm.sh/hook: crd-install</code>	Supported as equivalent to <code>argocd.argoproj.io/hook: PreSync</code> .
<code>helm.sh/hook: pre-install</code>	Supported as equivalent to <code>argocd.argoproj.io/hook: PreSync</code> .
<code>helm.sh/hook: pre-upgrade</code>	Supported as equivalent to <code>argocd.argoproj.io/hook: PreSync</code> .
<code>helm.sh/hook: post-upgrade</code>	Supported as equivalent to <code>argocd.argoproj.io/hook: PostSync</code> .
<code>helm.sh/hook: post-install</code>	Supported as equivalent to <code>argocd.argoproj.io/hook: PostSync</code> .
<code>helm.sh/hook-delete-policy</code>	Supported. See also <code>argocd.argoproj.io/hook-delete-policy</code> ).
<code>helm.sh/hook-weight</code>	Supported as equivalent to <code>argocd.argoproj.io/sync-wave</code> .
<code>helm.sh/resource-policy: keep</code>	Supported as equivalent to <code>argocd.argoproj.io/sync-options: Delete=false</code> .



# Helm Support: parameters visualization



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- Parameters defined in values files are detected automatically and visualized in Argo CD user interface

The screenshot shows the Argo CD user interface for an application named 'my-app'. The 'PARAMETERS' tab is selected, displaying a list of parameters defined in the Helm values file. The parameters are listed in a table-like format with their names and values.

PARAMETERS	Value
controller.appprotect.enable	false
controller.appprotectdos.debug	false
controller.appprotectdos.enable	false
controller.appprotectdos.maxDaemon	0
controller.appprotectdos.maxWorkers	0
controller.appprotectdos.memory	0

# Helm Support: dynamic parameters



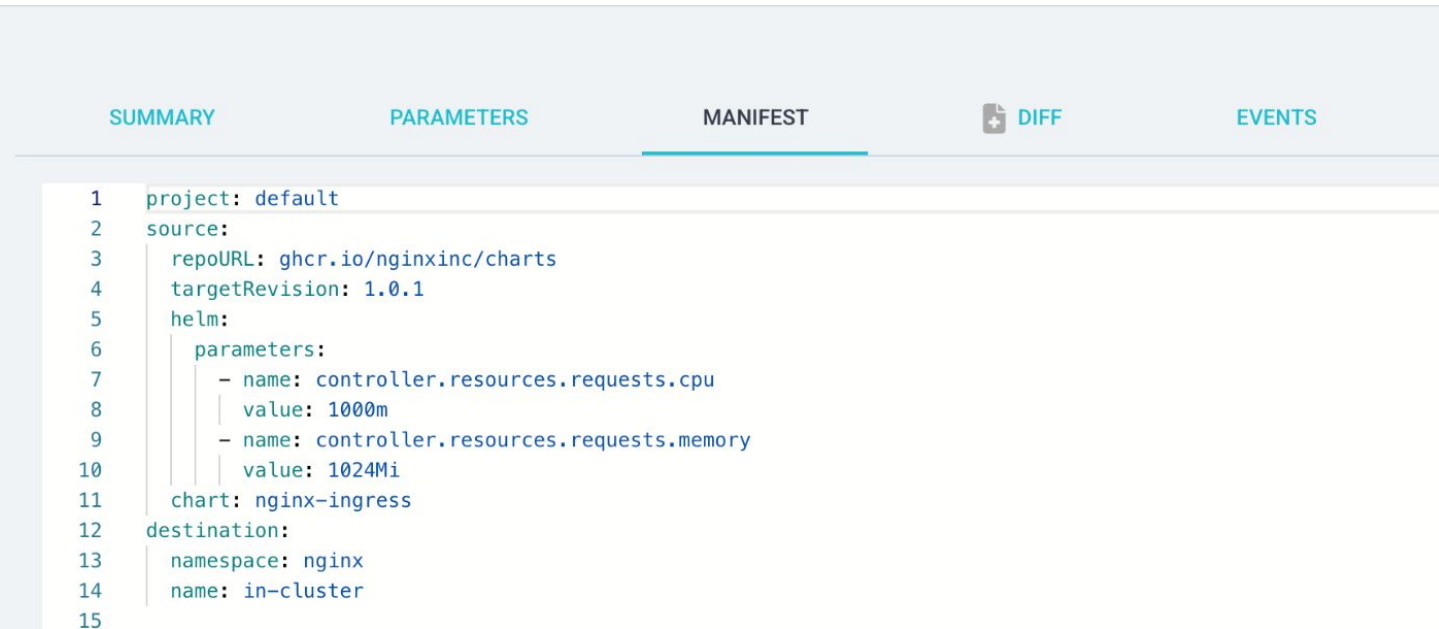
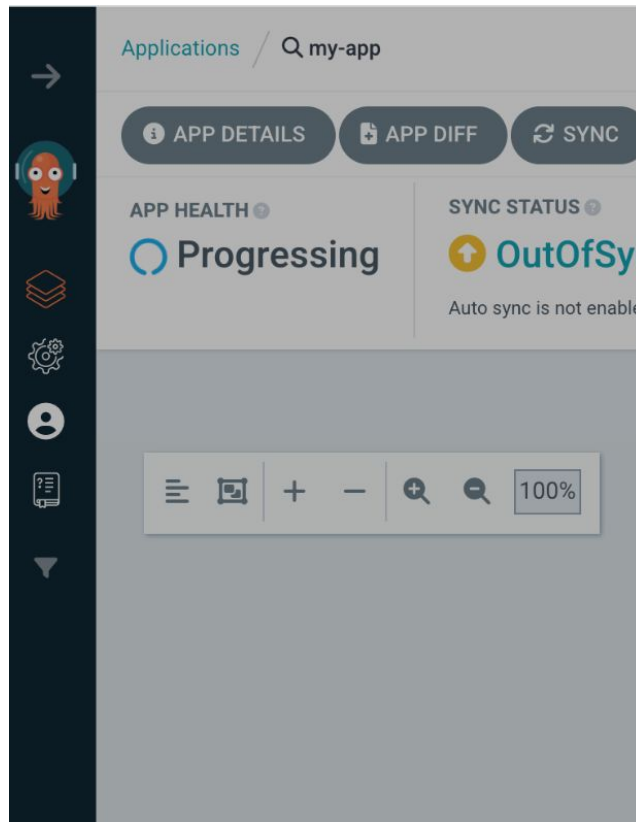
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- End users can use Argo CD UI/CLI to dynamically override parameters (if permitted)
- Useful for troubleshooting in dev/qa environments



# Helm Support: HTTPS/OCI Repositories



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- ☒ HTTPS Helm repo
- ☒ OCI Helm repo
- ☒ Private repositories
  - username/password protection
  - SSL cert
  - custom CA bundle

# Simple Example



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# TOY DEMO

# Real life

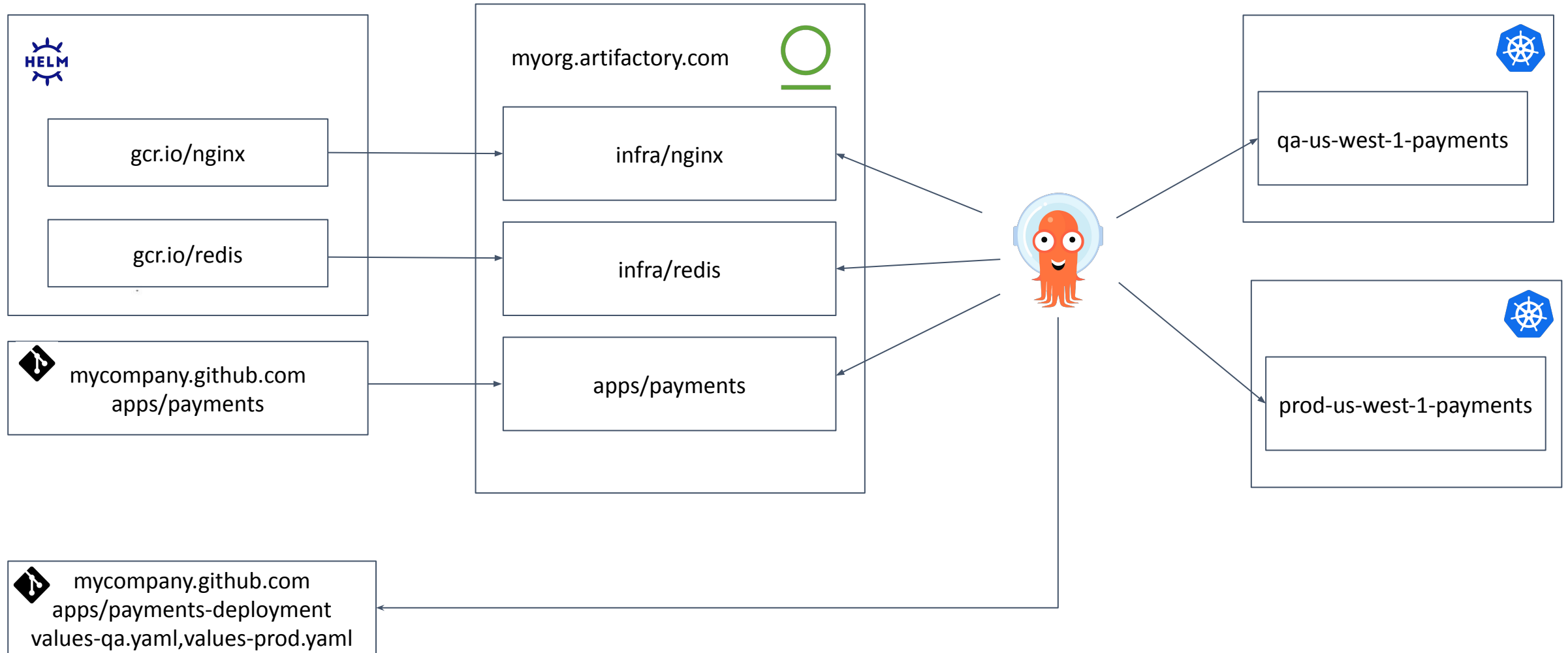


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# Option 1: umbrella chart



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- Typically charts are maintained in a different repository
- Off-the-shelf Helm charts for OSS components
- Application specific Helm charts in the source code repository

## Disadvantages:

- Overhead to manually maintain Chart.yaml
- No auto-upgrades (version is in git)

```
apiVersion: v2
name: wordpress
type: application
version: 0.1.0
appVersion: "1.0"
```

## dependencies:

```
- name: wordpress
  version: 9.0.3
  repository: https://charts.helm.sh/stable
```

# Option 2: multiple sources



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- Application is referencing both helm chart repository and Git repository with values files

```
apiVersion: argoproj.io/v1alpha1
kind: Application
metadata:
  name: nginx-prod
spec:
  project: default
  sources:
    # Of-the-shelf Nginx helm chart
    - repoURL: ghcr.io/nginxinc/charts
      targetRevision: 1.0.1
      helm:
        valueFiles:
          - $myRepo/values-prod.yaml
      chart: nginx-ingress
    # Private Git repo with various values files per environment
    - repoURL: 'https://github.com/my-org/my-repo.git'
      ref: myRepo

  destination:
    namespace: default
    server: https://kubernetes.default.svc
```



# Real life usage: multiple sources



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## REAL LIFE DEMO



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