1-Click Upgrade to Istio 1.13 using Helm

March 15, 2022

What's new in Istio 1.13?

Highlights

- Configure the Istio sidecar proxy with the ProxyConfig API
- Continued improvements to the Telemetry API
- Support for hostname based load balancers for multi-network gateways

For the complete list, please visit:

https://istio.io/latest/news/releases/1.13.x/announcing-1.13/change-notes/

Istio upgrade strategies

In-place upgrade

- Original strategy
- Simplest method
- "Riskier"

Canary upgrade

- Available since 1.6
- Best practice
- Safer

Helm
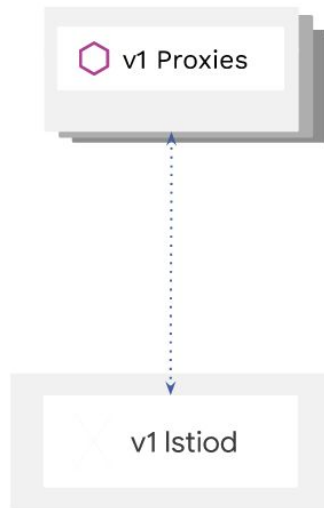
You can do both in-place and canary upgrades with Helm

In-place upgrade

Upgrade strategies

In-place

Prerequisites:
- You can skip 1 minor versions
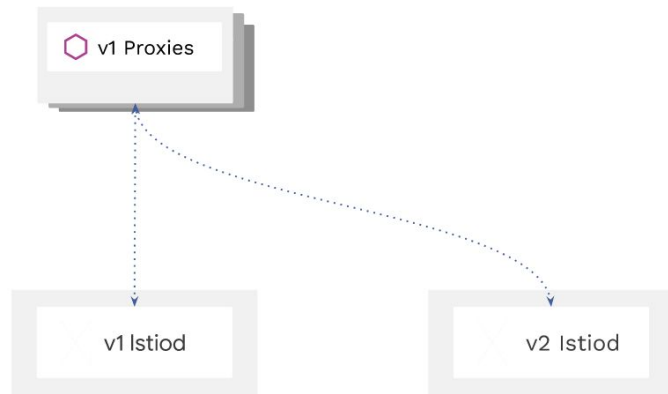
Upgrade strategies

In-place

Upgrading the control plane

```
$ istioctl upgrade [-f <IstioOperator-CRD-file>]
```
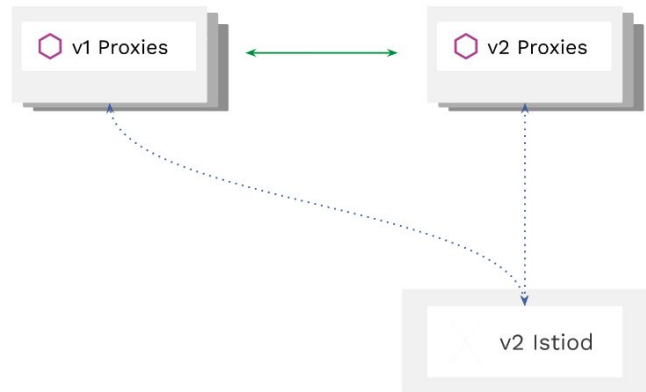
Upgrade strategies

In-place

Restarting the workloads
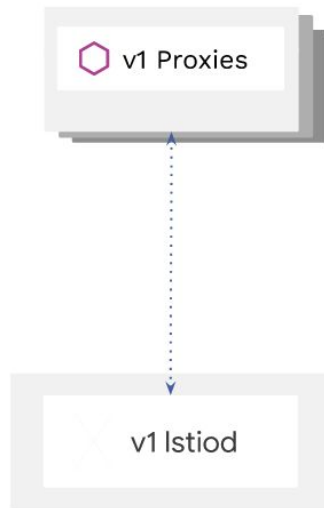
```
$ kubectl rollout restart deployment
```

Canary upgrade

Upgrade strategies

Canary

Prerequisites:

- You can skip **2 minor** versions

Upgrade strategies

Canary

Deploying target canary control plane

```
$ istioctl install --set revision=1-13-2
```
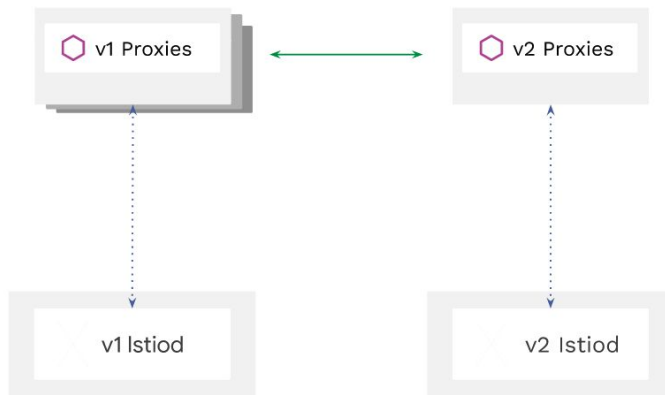
Upgrade strategies

Canary

Migrating workloads to the canary control plane

```
$ kubectl label namespace \
  test-ns istio-injection-istio.io/rev=1-13-2

$ kubectl rollout restart deployment -n test-ns
```
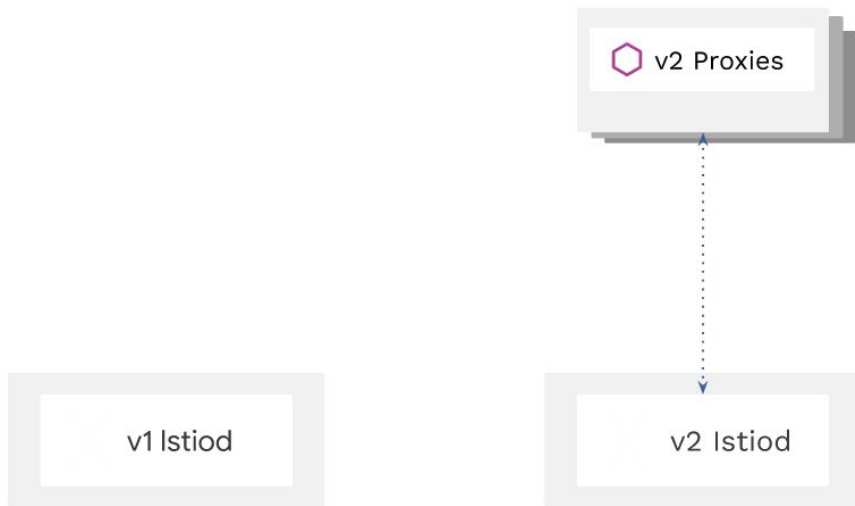
Upgrade strategies

Canary

Eventually all workloads are migrated
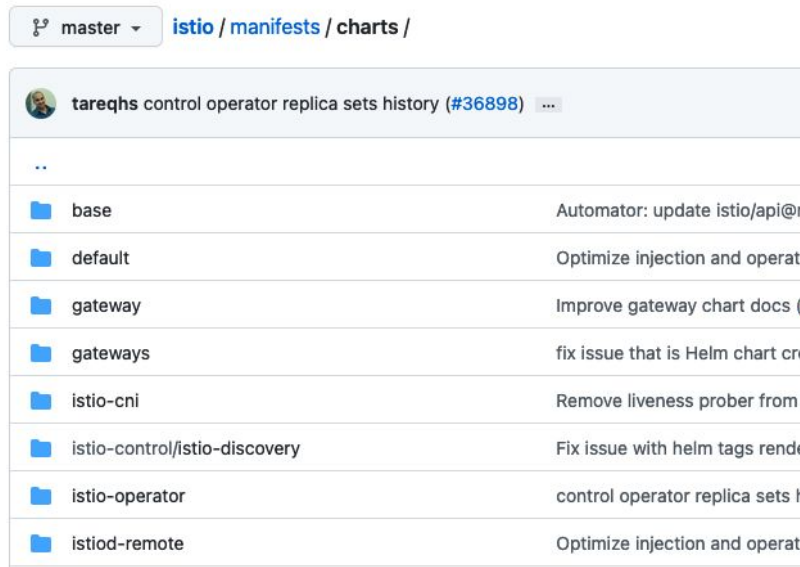
v2 Proxies

v1 Istiod

v2 Istiod

Upgrades with Helm and helmfile

Helm upgrades

- Popular deployment/package manager
- In-place and canary upgrades are both possible
- Official charts by Istio maintainers

Helmfile is optional, but it can…

- lock chart versions
- handle dependencies
- sync to avoid skew in environments

In-place upgrade with helmfile

- Complete Istio setup in ~20 lines of code
- Dependency can be set with `needs`
  1. Cluster-wide resources and CRDs: `istio/base`
  2. Control plane: `istio/istiod`
  3. Ingress/egress gateways: `istio/gateway`
- Interchangeable with Helm

Upgrade process:

1. Bump chart versions
2. `$ helmfile sync|apply`

```yaml
repositories:
  - name: istio
    url: https://istio-release.storage.googleapis.com/charts

releases:
  # Deploys base Istio components
  - name: istio-base
    chart: istio/base
    version: 1.12.3
    namespace: istio-system
    createNamespace: true

  # Deploys Istio control-plane
  - name: istio-discovery
    chart: istio/istiod
    version: 1.12.3
    namespace: istio-system
    needs:
      - istio-system/istio-base

  # Deploys istio-ingressgateway for inbound traffic
  - name: istio-ingressgateway
    chart: istio/gateway
    version: 1.12.3
    namespace: istio-system
    needs:
      - istio-system/istio-base
      - istio-system/istio-discovery
```

DEMO

Monitoring the upgrade

- Prometheus metrics
  - Proxy-level
    - `envoy_cluster_internal_upstream_rq{response_code_class="2xx"}`
  - Service-level
    - `istio_requests_total{destination_app="details"}`
  - Control-plane level
    - `istio_build{tag=~1.13.*}`

Monitoring the upgrade