RANCHER

CNCF Partner Webinar

Declarative Host Upgrades From Within Kubernetes

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Who's who

Adrian Goins
Director of Community
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Dax McDonald
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Jacob Blain Christen
Principal Software Engineer
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AGENDA

1 **Rancher Overview**
Adrian Goins, Director of Community

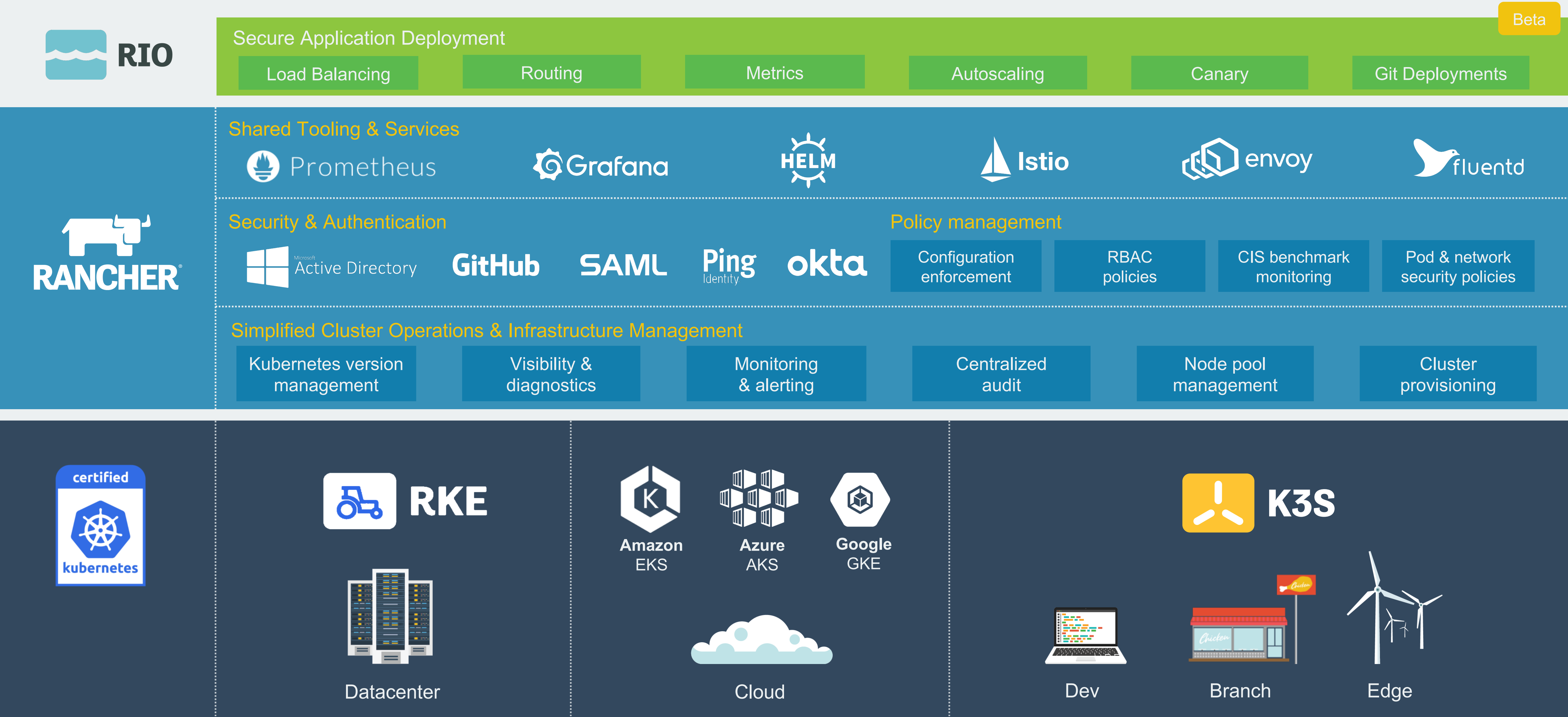
2 **An Overview of the SUC**
Dax McDonald, Software Engineer

3 **The SUC in Action**
Jacob Blain Christen,Principal Software Engineer

4 **Q&A**

Rancher Overview

Rancher’s recipe for production quality Kubernetes at scale



RIO

Beta

Secure Application Deployment

- Load Balancing
- Routing
- Metrics
- Autoscaling
- Canary
- Git Deployments

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Shared Tooling & Services

- Prometheus
- Grafana
- HELM
- Istio
- envoy
- fluentd

Security & Authentication

- Microsoft Active Directory
- GitHub
- SAML
- Ping Identity
- okta

Policy management

- Configuration enforcement
- RBAC policies
- CIS benchmark monitoring
- Pod & network security policies

Simplified Cluster Operations & Infrastructure Management

- Kubernetes version management
- Visibility & diagnostics
- Monitoring & alerting
- Centralized audit
- Node pool management
- Cluster provisioning

certified kubernetes

RKE

Datacenter

Amazon EKS

Azure AKS

Google GKE

Cloud

K3S

Dev

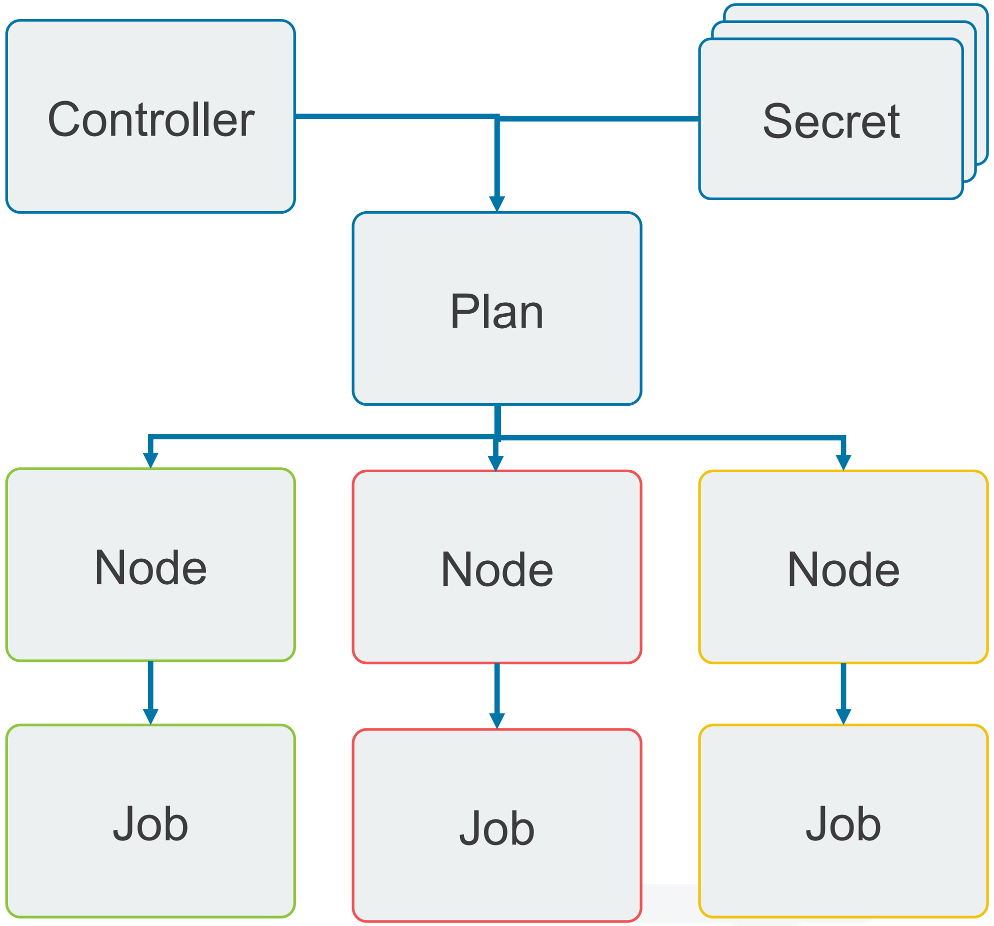
Branch

Edge

System Upgrade Controller

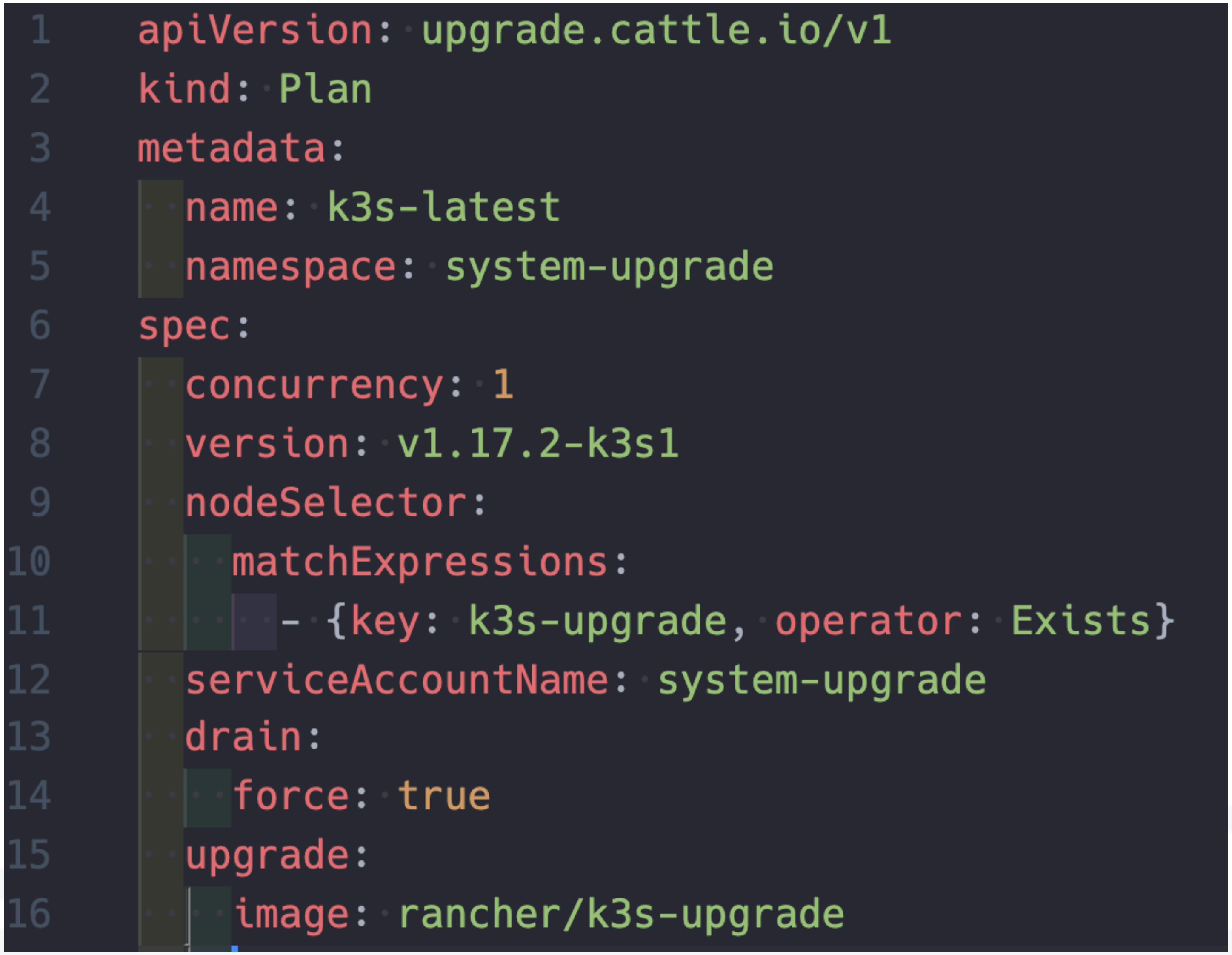
System Upgrade Controller Architecture

The ***Controller*** manages ***Plans*** by selecting ***Nodes*** to run upgrade ***Jobs*** on. A ***Plan*** defines which ***Nodes*** are eligible for upgrade by specifying a label selector. When a ***Job*** has run to completion successfully the ***Controller*** will label the ***Node*** on which it ran according to the ***Plan*** that was applied by the ***Job***.



Plan CRD

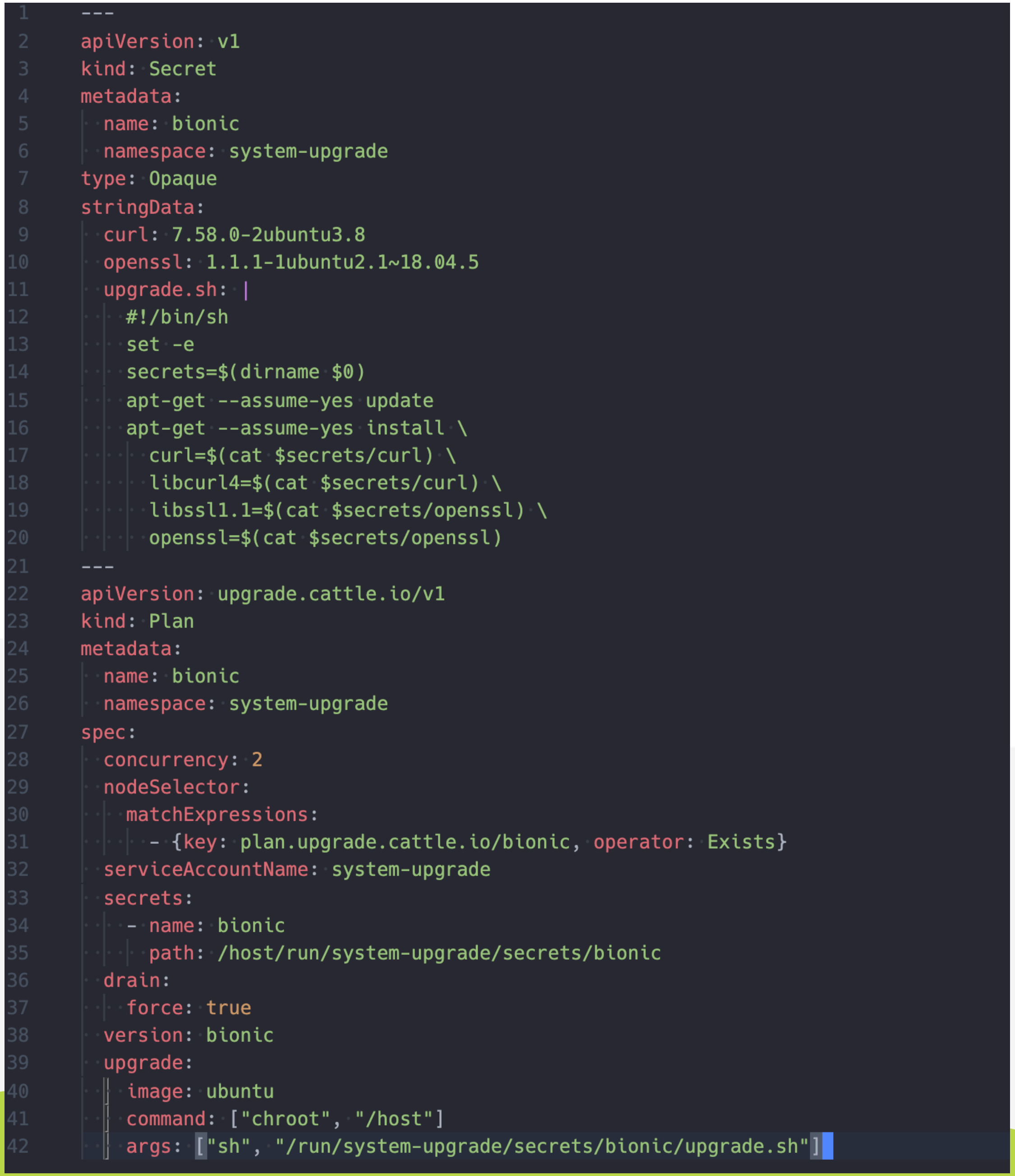
- Leveraging Kubernetes CRDs with the system-upgrade controller creates a declarative API.
- A Plan is an outstanding intent to mutate a system
- Its a declarative definition to mutate a system
- Image-based approach



```yaml
apiVersion: upgrade.cattle.io/v1
kind: Plan
metadata:
  name: k3s-latest
  namespace: system-upgrade
spec:
  concurrency: 1
  version: v1.17.2-k3s1
  nodeSelector:
    matchExpressions:
      - {key: k3s-upgrade, operator: Exists}
  serviceAccountName: system-upgrade
  drain:
    force: true
  upgrade:
    image: rancher/k3s-upgrade
```

Plan CRD continued

- Optional support for secrets to parameterize plans
- Allows for more granular updates at the package level



```yaml
---
apiVersion: v1
kind: Secret
metadata:
  name: bionic
  namespace: system-upgrade
type: Opaque
stringData:
  curl: 7.58.0-2ubuntu3.8
  openssl: 1.1.1-1ubuntu2.1~18.04.5
  upgrade.sh: |
    #!/bin/sh
    set -e
    secrets=$(dirname $0)
    apt-get --assume-yes update
    apt-get --assume-yes install \
      curl=$(cat $secrets/curl) \
      libcurl4=$(cat $secrets/curl) \
      libssl1.1=$(cat $secrets/openssl) \
      openssl=$(cat $secrets/openssl)
---
apiVersion: upgrade.cattle.io/v1
kind: Plan
metadata:
  name: bionic
  namespace: system-upgrade
spec:
  concurrency: 2
  nodeSelector:
    matchExpressions:
      - {key: plan.upgrade.cattle.io/bionic, operator: Exists}
  serviceAccountName: system-upgrade
  secrets:
    - name: bionic
      path: /host/run/system-upgrade/secrets/bionic
  drain:
    force: true
  version: bionic
  upgrade:
    image: ubuntu
    command: ["chroot", "/host"]
    args: ["sh", "/run/system-upgrade/secrets/bionic/upgrade.sh"]
```

From https://github.com/rancher/system-upgrade-controller/blob/master/examples/ubuntu/bionic.yaml

Demo Time!

Thank you

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