

Future Directions

An Ansible Developer and Ecosystem Story

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```
$ git show f31421576b00f0b167cdb61217c31c21a41ac02
Author: Michael DeHaan <michael.dehaan@gmail.com>
Date: Thu Feb 23 14:17:24 2012 -0500
```

Genesis.

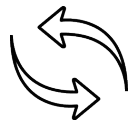
```
diff --git a/README.000000md b/README.md
new file mode 100644
index 0000000000..60bbc9f813
--- /dev/null
+++ b/README.md
@@ -0,0 +1,88 @@
+Ansible
+=====
```

The Ansible Way



SIMPLE

- Human readable automation
- No special coding skills needed
- Tasks executed in order
- Usable by every team
- Get productive quickly



POWERFUL

- App deployment
- Configuration management
- Workflow orchestration
- Network automation
- Orchestrate the app lifecycle



AGENTLESS

- Agentless architecture
- Uses OpenSSH & WinRM
- No agents to exploit or update
- Get started immediately
- More efficient & more secure

Batteries Included

cloud
clustering
containers
cryptography
database
DNS
files

inventory
identity
messaging
monitoring
network
notifications
packaging
security

source control
storage
system
testing
utilities
web infrastructure
windows

“Modularity and option value create opportunities for the exchange of valuable work among developers, opportunities that do not exist in codebases that are not modular or have no option value.”

SOURCE: The Architecture of Participation. Carliss Y. Baldwin, Kim B. Clark, Harvard Business School, Oct. 2005.

It Has Been Working

Octoverse 2018: #7 for unique contributors (~4100)

14,000

FORKS

35,000

STARS

40k

COMMITTS

“Whenever an individual or a business decides that success has been attained, progress stops.”

Thomas J. Watson

Growing Pains

- **Volume** of contributions is weighing down releases
- **Bottlenecks** to participation
- Slowing release **cadences** means slower feature adoption
- Dramatic **expansion** of the use cases over time
- **Embedding** of Ansible in other projects/products

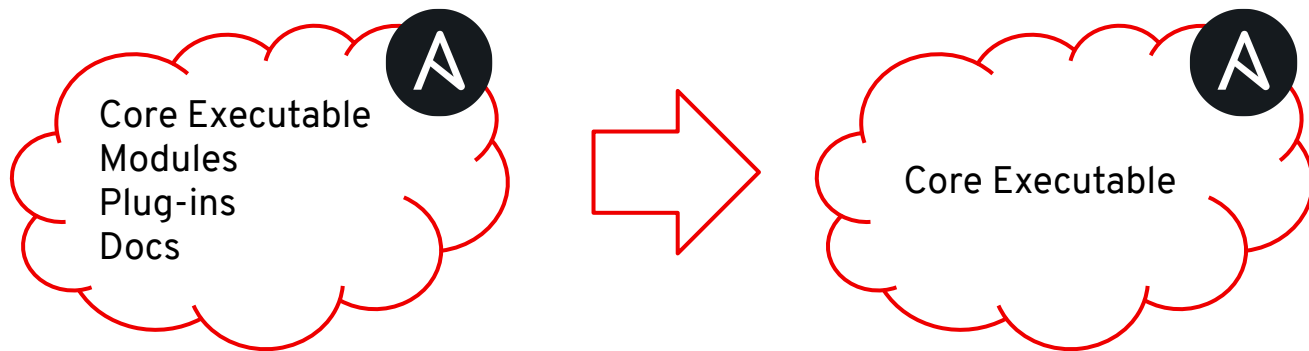
What Does This Mean?



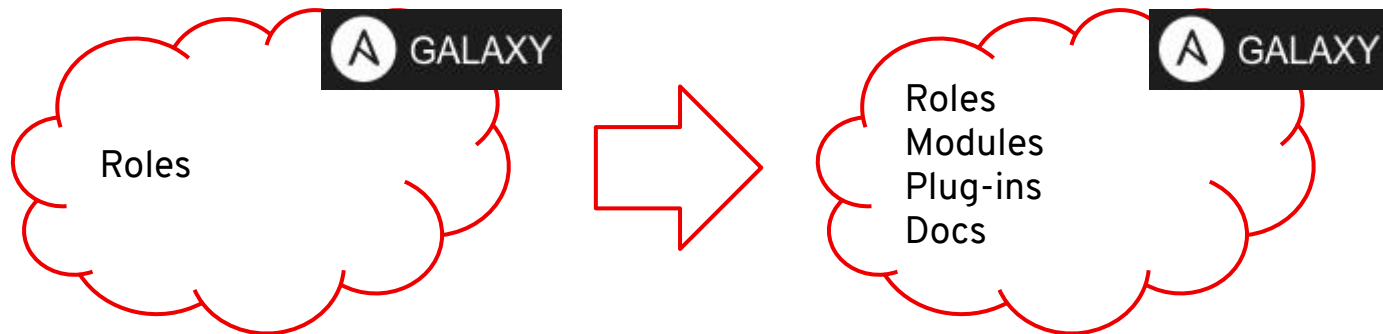
Ansible is evolving and needs to become
a **platform** for automation

A few sane options are needed to supplement the ease and simplicity of the “batteries included” distribution model

The Proposal



The Proposal



Assumptions Change

In adjusting to these changes in the assumptions that Ansible has relied upon, these issues now need to be addressed:

- Managing namespace conflicts & incompatibilities
- Initialization performance
- Quality control and testing
- Versioning

New Requirements

New and additional tooling will have to be developed for the platform ecosystem to thrive

- A New Packaging Format for Ansible Content
- Content Package Management
- Developer Tools
- Enhance Roles
- Enhance and Extend The Galaxy Hub (galaxy.ansible.com)

A New Packaging Format

Ansible needs new means of packaging and shipping content -- **independent** and **external** to the core engine

- The Ansible Role packaging format is insufficient
- Simple, lightweight and consistent with the Ansible way
- Can contain multiple Ansible modules, plugins, roles and maybe more



Ansible Content Collection

A new format for delivering content independently of the Ansible core engine

Provides quick benefit by lowering barriers to automation

Streamlines tech partners providing direct-to-user automation

Simplifies internal collaboration, distribution, versioning

Ability to distribute, share and consume content at your own pace



Ansible Content Collection Preview

```
.
├── galaxy.yml
├── plugins
│   ├── action
│   │   └── ping.py
│   ├── module_utils
│   │   └── pingutils.py
│   └── modules
│       └── ping.py
└── roles
    ├── ping_bootstrap
    │   ├── defaults
    │   ├── filters
    │   ├── meta
    │   ├── tasks
    │   └── vars
    └── ping_deploy
        ├── defaults
        ├── meta
        └── tasks
```

Ansible Content Collection Preview

```
hosts: somehosts
collections:
  - tima.pinger
  - redhat.open_ping

tasks:
  - tima.pinger.ping:

  - ansible.builtin.ping: # use only the ping packaged in core

  - ansible.legacy.ping: # use core or library(etc)/ping.py
    when: thing | tima.pinger.filter == 42

  - ping: # searches collections "path" otherwise...
          # still works, == ansible.legacy.ping:
```

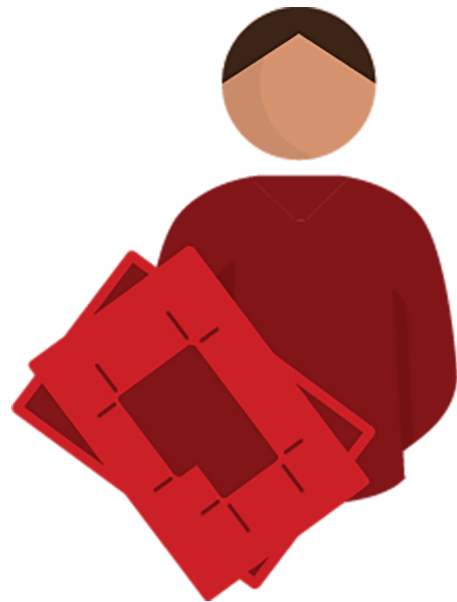
Content Package Management

A new content packaging format requires a manager

- The **ansible-galaxy** CLI: insufficient (and not really package manager)
- Wanted to experiment - without risk of breaking stuff
- Simplicity over flexibility and package management norms
- Focus strictly on management functions and not development

This brought us: **Mazer**

But... in the end: **ansible-galaxy** again.



Developer Tools

Provide effective and standardized means of developing content - **new tools!**

- Molecule: An Ansible testing framework
- ansible-test: lint and sanity tests integration
- ansible-lint: Static analyser for Ansible best practices and other checks
 - Integration with galaxy.ansible.com: auto testing of content



WIP: Restructuring The Ansible Project

From a **development** perspective, Ansible is broken out into different components

- The core engine
- The core modules and plugins
- The community modules and plugins
- Various supported partner modules and plugins

All of these different components are built in the form of Ansible Content Collections.

WIP: Restructuring The Ansible Project

From a **distribution** perspective, Ansible is delivered in one of two fundamental ways

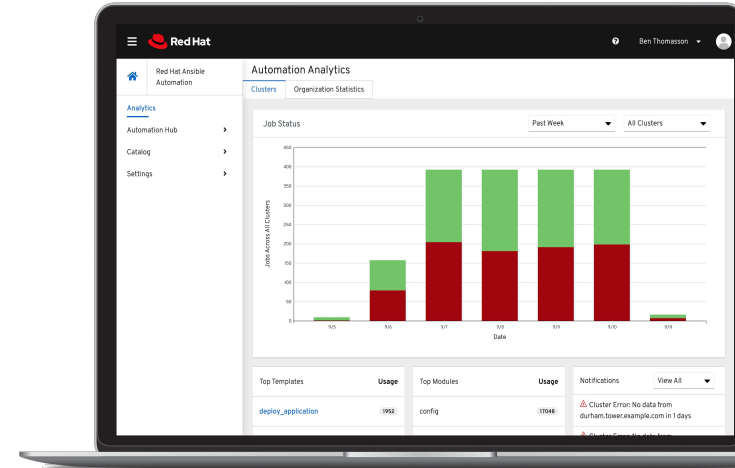
- A batteries-included method
- A supported enterprise method

Both of these methods depend heavily on Ansible Galaxy as the de facto delivery mechanism.

More: ansible.com/blog/thoughts-on-restructuring-the-ansible-project

Product Developments

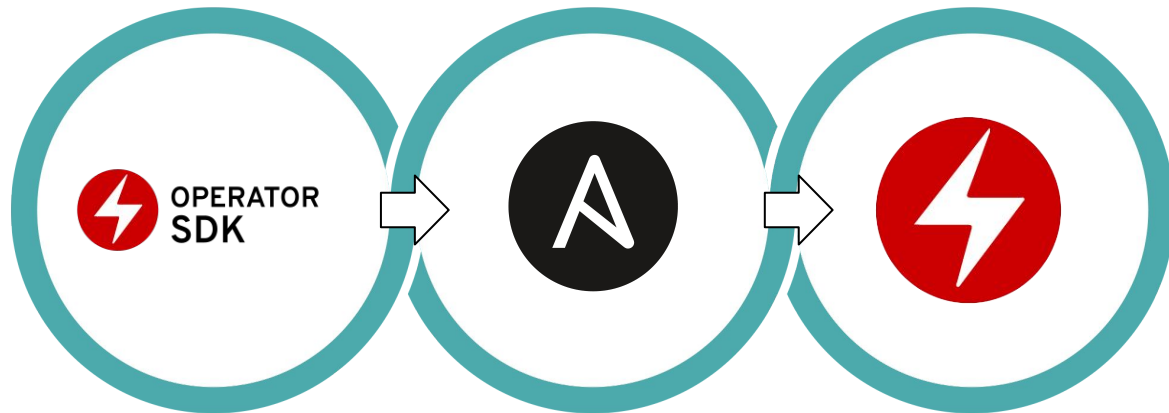
- Ansible Tower/AWX
 - Scalable Execution Capacity
 - Centralized Automation Console
 - Webhooks and Native GitOps support
- Ansible services via cloud.redhat.com
 - Automation Hub
 - Automation Analytics
- Content Packages -- Network & Security Automation Collections



Kubernetes Operators with Ansible

Ansible Operator SDK

Making it easier to deploy and manage Kubernetes apps in an Ansible-native way



operator-sdk new

Use the Operator SDK to create a new skeleton Operator.

Add Ansible Content

Use Ansible Roles and playbooks to manage lifecycle events for your containerized applications.

operator-sdk build

Use the Operator SDK to build and deploy your Operator to Kubernetes.

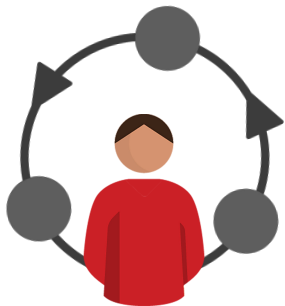
Kubernetes Operators

Operators simplify management of complex applications on Kubernetes



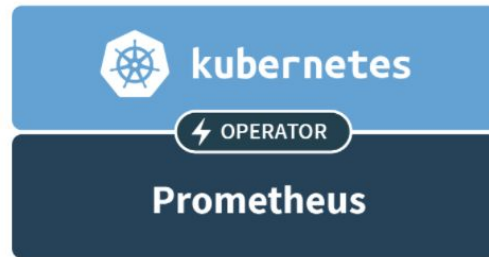
- Encode human operational knowledge
- **Automatically patch, upgrade, recover, and tune container-based apps and services**
- Kubernetes-native
- Purpose-built for a specific application or service
- Enable “day 2” management

Encoding and automating Ops knowledge



WITHOUT OPERATORS: **REACTIVE**

- Continually checks for anomalies
- Alert humans for response
- Requires manual change to fix



WITH OPERATORS: **PROACTIVE**

- Continually adjusts to optimal state
- Automatically acts in milliseconds

Why build Operators with Ansible?

EXISTING SKILLS & ECOSYSTEM

Same tried & trusted Ansible tooling

Utilize existing skills

Supports cloud-native & traditional IT automation with one simple language

Leverages vibrant existing ecosystem

LOWER BARRIER OF ENTRY

No programming required

Faster iterations and easier maintenance

Declarative state definitions like K8s

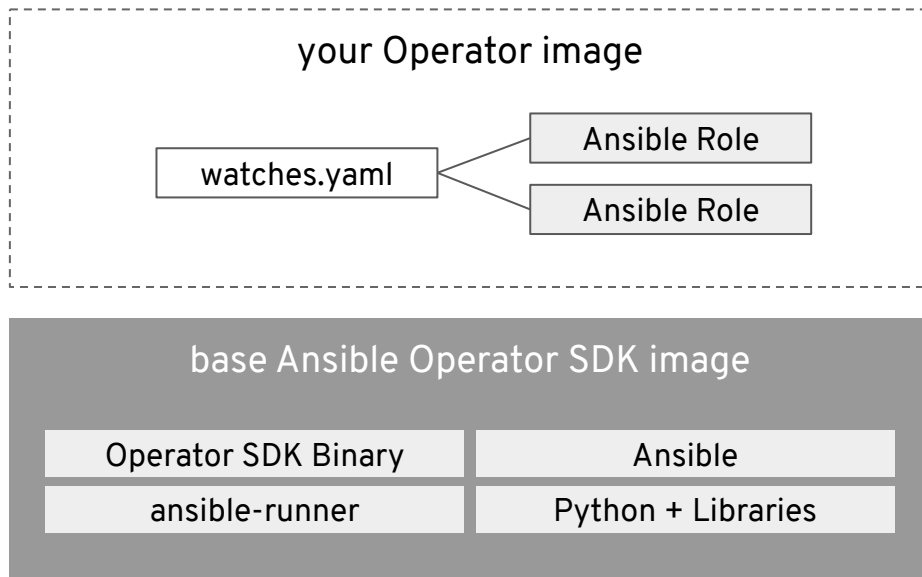
Templating of resources

Abstraction layer & helpers that reduces necessary K8s API experience

Developing your first Operator with Ansible

- Initialize Your Operator With Ansible
 - `$ operator-sdk new null-operator --api-version=cache.example.com/v1alpha1 --kind=Null --type=ansible`
- Automate With Ansible
 - Create new roles and playbooks or reuse an existing one
- Define a watches file
 - Map a Kubernetes object to your Ansible content
- Build Your Operator
 - `$ operator-sdk build null-operator:v0.0.1`
- Deploy Your Operator to a Kubernetes Cluster

Anatomy of Ansible-enabled Operator image



So **when** are we getting this?

Ansible 2.8

Collections in tech preview

Partner options:

Certified:

- Modules/plugins in ansible/ansible

Non-Certified:

- Modules/plugins in ansible/ansible
- Collections/roles/modules in Galaxy
- Content distributed independently

Ansible 2.10

Certified Collections Defined

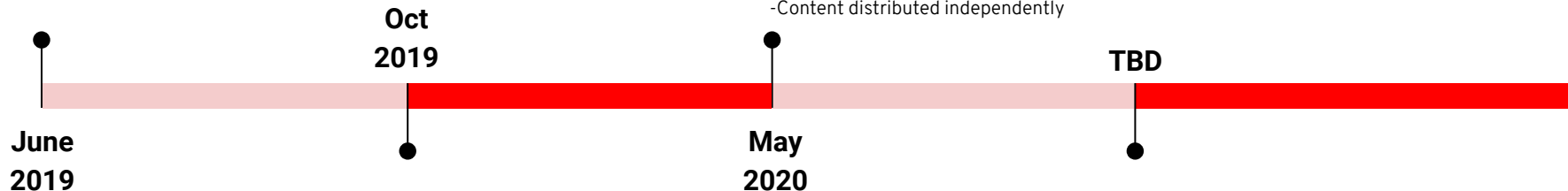
Partner options:

Certified:

- Collections in Galaxy
- Modules/plugins in ansible/ansible (existing only - no new content allowed)

Non-Certified:

- Modules/plugins in ansible/ansible (existing only - no new content allowed)
- Collections/roles/modules in Galaxy
- Content distributed independently



Ansible 2.9

Full support for Collections

Partner options:

Certified:

- Collections in Galaxy
- Modules/plugins in ansible/ansible

Non-Certified:

- Modules/plugins in ansible/ansible
- Collections/roles/modules in Galaxy
- Content distributed independently

Ansible 3.0

Partner content removed from Core

Partner options:

Certified:

- Collections in Automation Hub

Non-Certified:

- Collections in Galaxy
- Content distributed independently

Resources

Developing Collections:

https://docs.ansible.com/ansible/devel/dev_guide/developing_collections.html

Using Collections:

https://docs.ansible.com/ansible/devel/user_guide/collections_using.html

Guided Demo:

<https://github.com/jctanner/rhte-2019>

Thoughts on Restructuring the Ansible Project

<https://ansible.com/blog/thoughts-on-restructuring-the-ansible-project>

Demo Collection in Galaxy

https://galaxy.ansible.com/newswangerd/collection_demo

Resources

Getting Started with Operators

<https://github.com/operator-framework/getting-started>

Kubernetes and Ansible

<https://www.ansible.com/operators>

Ansible Operator SDK

<https://github.com/operator-framework/operator-sdk/tree/master/doc/ansible>

Building Kubernetes Operators in an Ansible-native Way CNCF Webinar

<https://www.cncf.io/webinars/building-kubernetes-operators-in-an-ansible-native-way/>

Contributing & More

Try it and open issues please

- github.com/ansible/galaxy
- github.com/ansible/ansible-lint
- github.com/ansible/molecule
- galaxy-dev.ansible.com
- #ansible-galaxy on freenode IRC
- #ansible-molecule on freenode IRC
- <https://groups.google.com/forum/#!forum/operator-framework>
- Kubernetes Slack (slack.kubernetes.io) #kubernetes-operators

Thank You



linkedin.com/company/red-hat



youtube.com/user/RedHatVideos

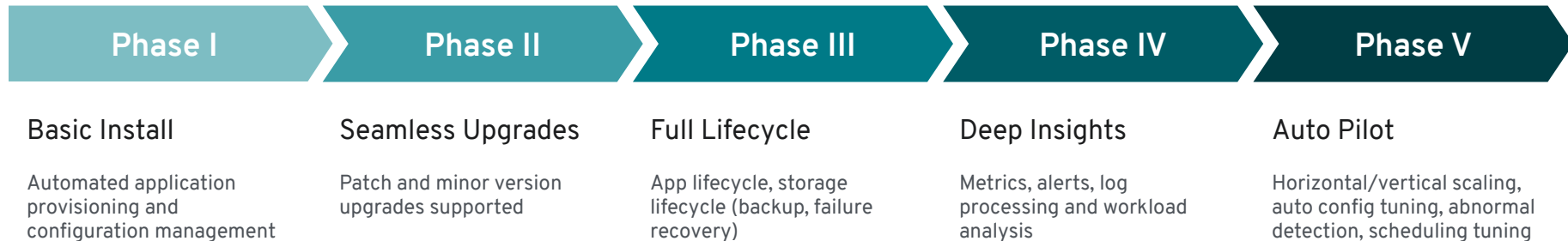


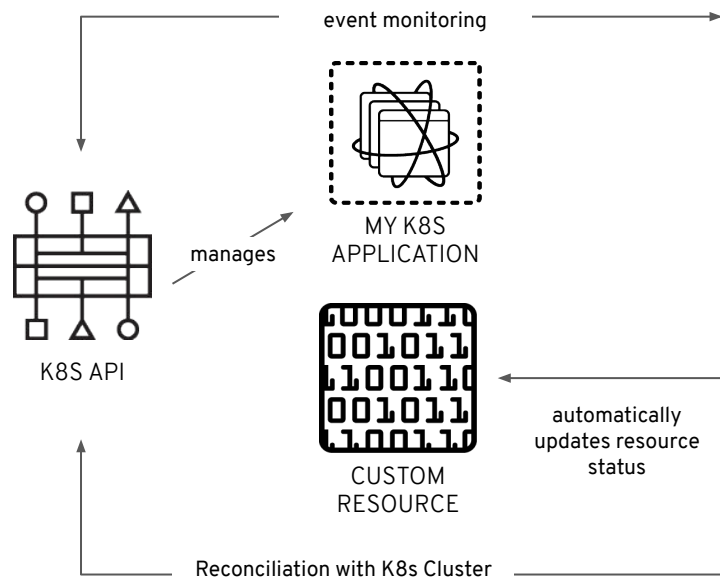
facebook.com/redhatinc



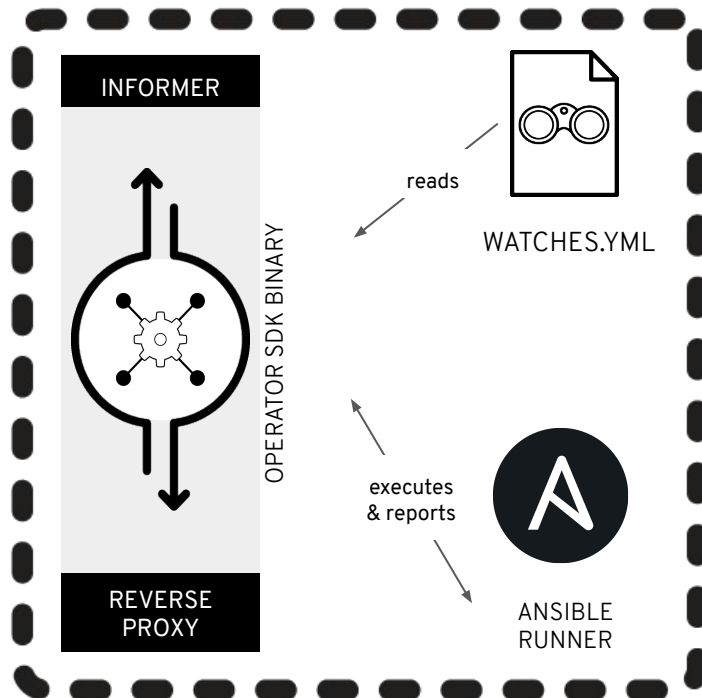
twitter.com/RedHat

Operator capability level





K8s Operator with Ansible



Next steps

Get started with Ansible:

ansible.com/get-started

ansible.com/community

Get started with Operators:

github.com/operator-framework/getting-started

ansible.com/operators

More resources

```
$ kubectl create -f example/deployment.yaml
```

Install etcd Operator

etcd Operator

A great example of a sophisticated Kubernetes Operator using Ansible:

github.com/water-hole/etcd-ansible-operator

Memcached Operator

Simple walkthrough for building an Operators using the Ansible Operator SDK and Kubernetes CRDs

github.com/operator-framework/operator-sdk-samples/tree/master/memcached-operator