How to Teach Old Apps New Tricks with Ansible-based Operators: Part 1

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PART ONE

- What is Kubernetes?
- Containers and State
- What’s an Operator?
- Ansible-based Operators
WHAT IS KUBERNETES?
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“Kubernetes (k8s) is an open-source system for automating deployment, scaling, and management of containerized applications.”

https://kubernetes.io/
Red Hat® OpenShift® Container Platform offers enterprises full control over their Kubernetes environments, whether they’re on-premise or in the public cloud.

https://www.openshift.com/
CONTAINERS AND STATE
STATELESS IS EASY
ORGANIZATIONS RUN ON STATE
STATELESS IS EASY, STATEFUL IS HARD
WHAT’S AN OPERATOR?
Kubernetes Operators encode the human knowledge required to install, upgrade, patch, recover from failure, and tune applications and services.

https://github.com/operator-framework/operator-sdk
OPERATORS MANAGE STATE

Declare operational knowledge from experts as code

Operator SDK

Deployments
StatefulSets
Autoscalers
Secrets
Config maps
ANSIBLE-BASED OPERATORS
### YAML: YEAH YOU KNOW ME!

**k8s-deployment.yaml**

```yaml
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: motd-operator
spec:
  replicas: 1
  selector:
    matchLabels:
      name: motd-operator
  template:
    metadata:
      ...
```

**ansible-task.yml**

```yaml
---
- name: Save the STATE
  copy:
    dest: /motd.timestamp
    src: /etc/motd
    owner: root
    group: root
    mode: 0644
    remote_src: true
    ...
```
The Ansible Kubernetes module enables the Operator SDK to utilize Ansible and its ecosystem to manage applications inside Kubernetes and OpenShift.
OPERATOR CAPABILITY LEVEL

Phase I
Basic Install
Automated application provisioning and configuration management

Phase II
Seamless Upgrades
Patch and minor version upgrades supported

Phase III
Full Lifecycle
App lifecycle, storage lifecycle (backup, failure recovery)

Phase IV
Deep Insights
Metrics, alerts, log processing and workload analysis

Phase V
Auto Pilot
Horizontal/vertical scaling, auto config tuning, abnormal detection, scheduling tuning

HELM
ANSIBLE
Building Operators with Ansible

**CHALLENGE**

Operators are usually written in Go by software developers that are highly familiar with Kubernetes.

**SOLUTION**

Ansible is a first-class citizen in the Operator SDK. Ansible-based Operators provide a lower barrier to entry, faster iterations, and the power of Ansible and its ecosystem. Put more simply, an Operator is designed to watch and respond to the resources in your cluster to enable your application to run as desired. After the Operator SDK is invoked, it's Ansible code as opposed to a common approach of handling these events with Go code.

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Learn the basics of Kubernetes

Key components, architecture, and how to get started
BUT WAIT THERE’S MORE
IN PART TWO
THANK YOU

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