



# 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/>

# ENTERPRISE KUBERNETES

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/>



**Red Hat  
OpenShift**

# CONTAINERS AND STATE

# STATELESS IS EASY

# ORGANIZATIONS RUN ON STATE



**STATELESS IS EASY, STATEFUL IS HARD**

# WHAT'S AN OPERATOR?

# KUBERNETES OPERATORS



OPERATOR  
SDK

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>

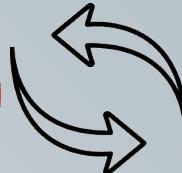
# OPERATORS MANAGE STATE



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

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

```

## ansible-task.yml

```
---
- name: Save the STATE
  copy:
    dest: /motd.timestamp
    src: /etc/motd
    owner: root
    group: root
    mode: 0644
    remote_src: true
  ...

```

# OPERATOR SDK ❤️ ANSIBLE

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

## Phase II

## Phase III

## Phase IV

## Phase V

### Basic Install

Automated application provisioning and configuration management

### Seamless Upgrades

Patch and minor version upgrades supported

### Full Lifecycle

App lifecycle, storage lifecycle (backup, failure recovery)

### Deep Insights

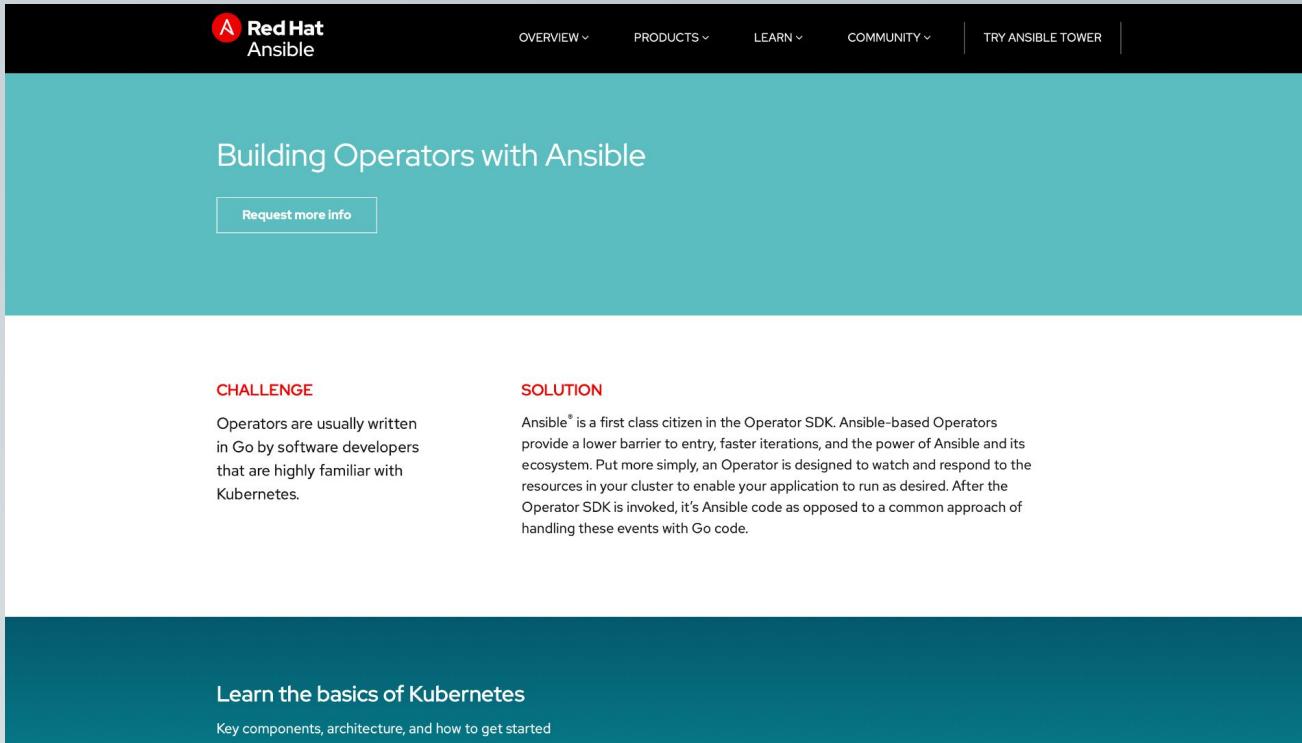
Metrics, alerts, log processing and workload analysis

### Auto Pilot

Horizontal/vertical scaling, auto config tuning, abnormal detection, scheduling tuning



# ansible.com/operators



The screenshot shows the homepage of [ansible.com/operators](https://ansible.com/operators). The top navigation bar includes the Red Hat Ansible logo, and menu items for OVERVIEW, PRODUCTS, LEARN, and COMMUNITY, along with a 'TRY ANSIBLE TOWER' button. The main content area has a teal header with the title 'Building Operators with Ansible' and a 'Request more info' button. Below this, the page is divided into two columns: 'CHALLENGE' and 'SOLUTION'. The 'CHALLENGE' section states: 'Operators are usually written in Go by software developers that are highly familiar with Kubernetes.' The 'SOLUTION' section states: '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.' At the bottom, a teal footer bar offers a 'Learn the basics of Kubernetes' link and a 'Key components, architecture, and how to get started' link.

## Building Operators with Ansible

Request more info

### CHALLENGE

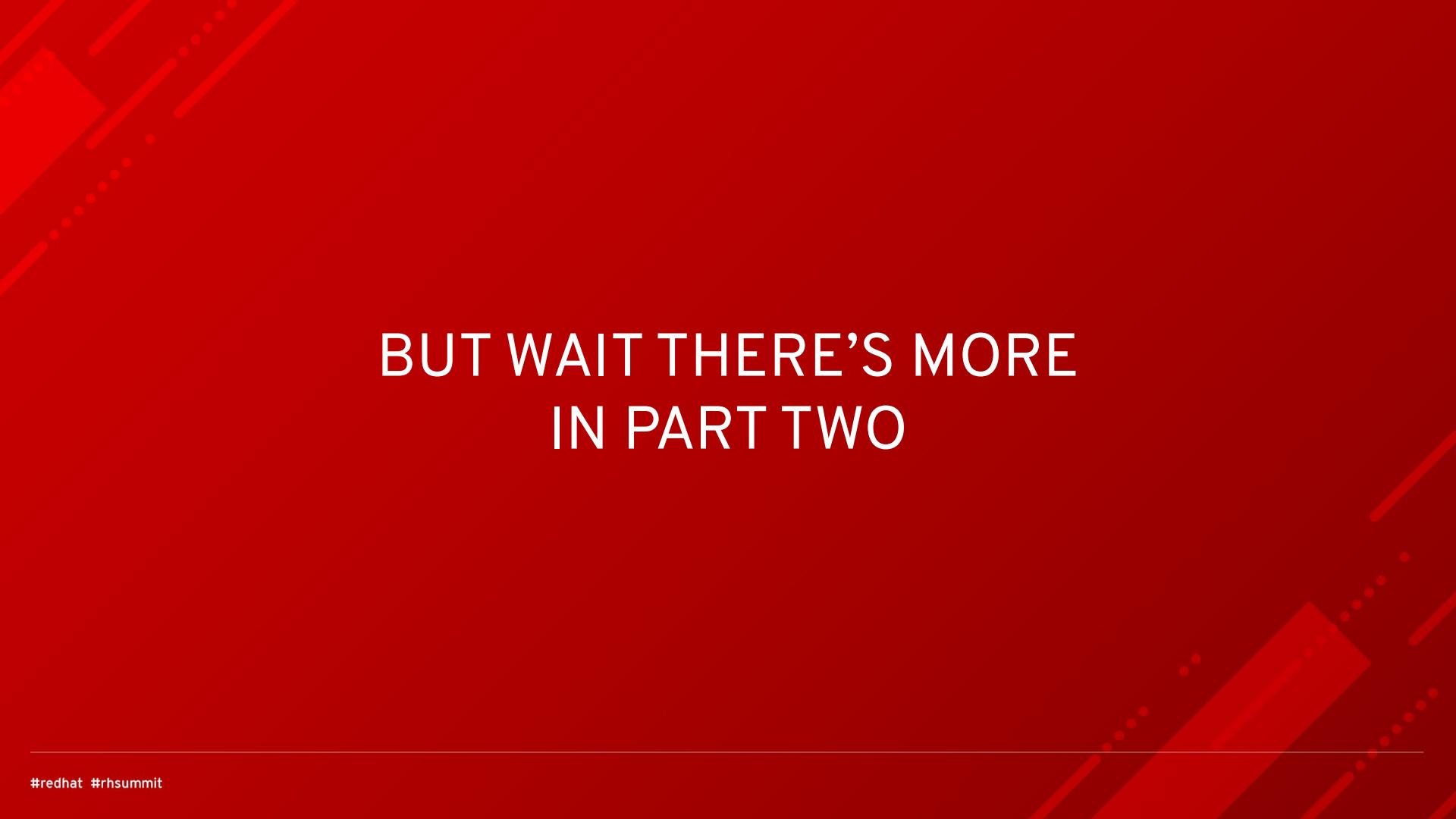
Operators are usually written in Go by software developers that are highly familiar with Kubernetes.

### 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.

### 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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