# Introduction to Red Hat OpenShift

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# Containers are the new normal

**$3.0B**

2024 Container Software Market

**36.2%**

CAGR 2021-2026



Source: IDC: Worldwide Container Infrastructure Software Revenue 2021-2026($M), May 2022

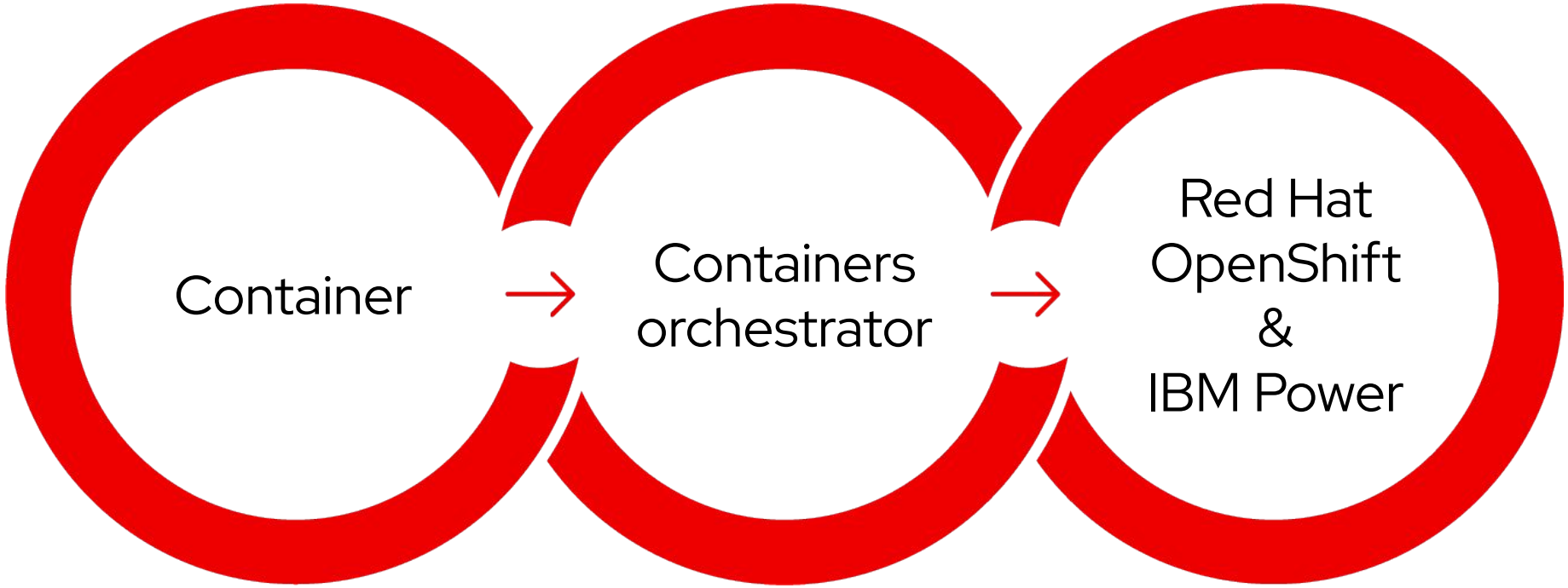
# Why Red Hat ?

- Leader in the 2024 Gartner® Magic Quadrant™ for Container Management
- Part of IBM since 2019

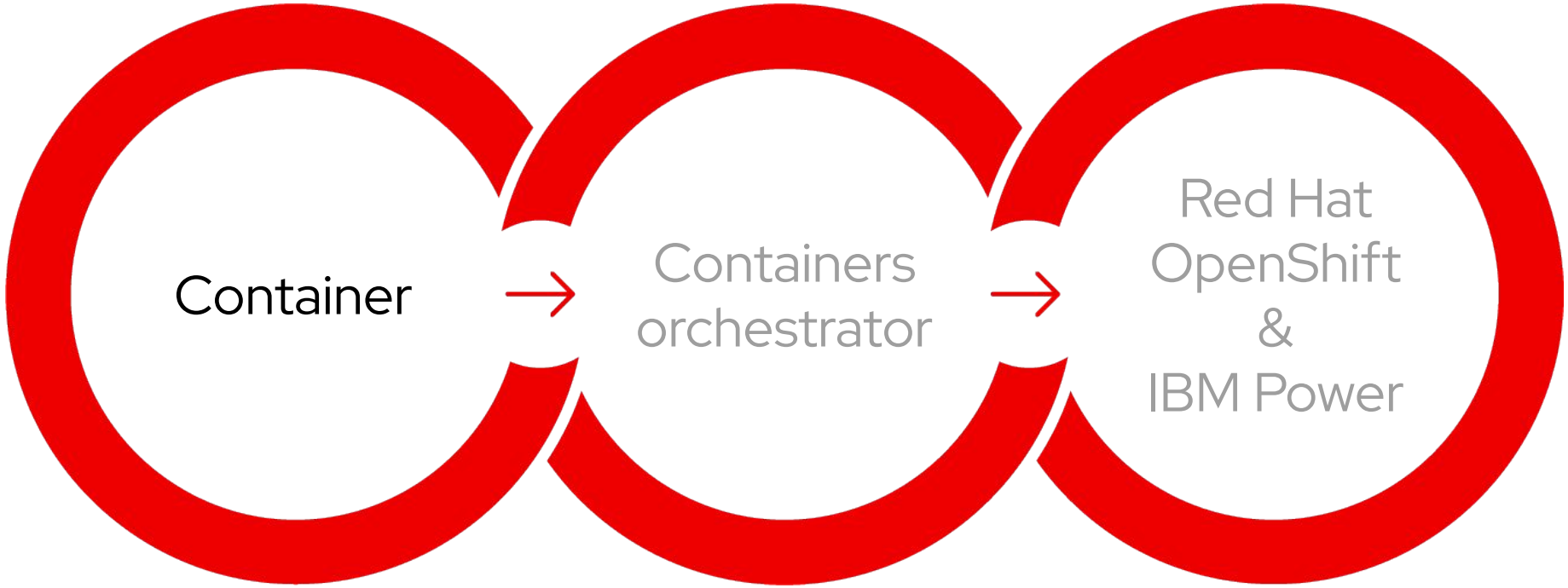
# Why me ?

- Working on OpenShift as Red Hat associate since 2021
- Technical Account Manager for OpenShift on selected customers

# What we'll discuss



# What we'll discuss



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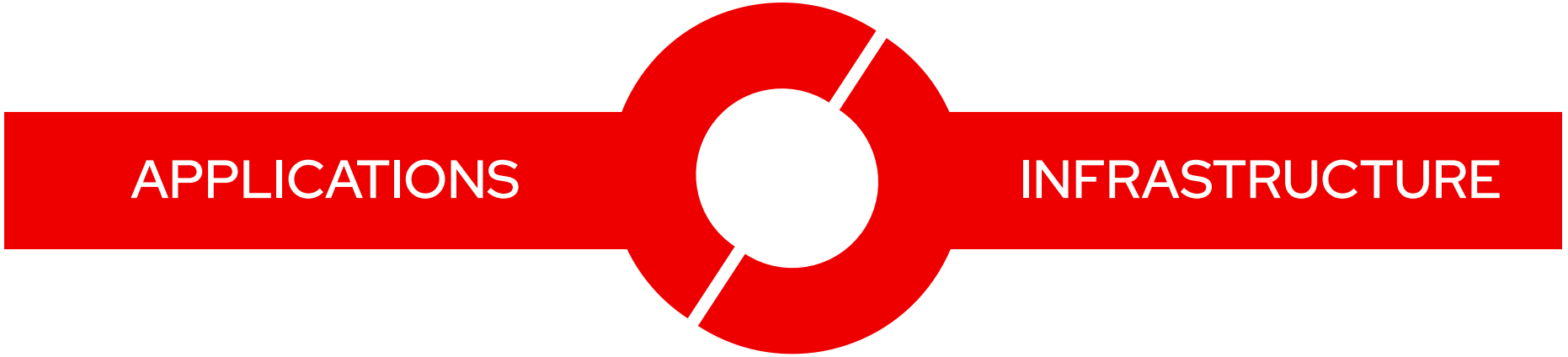
# What are containers ?

## It depends who you ask



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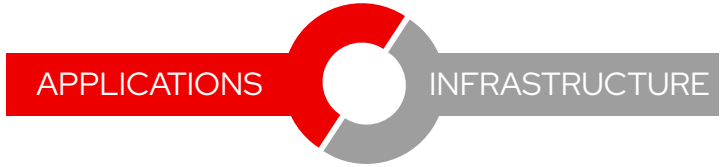


# The problem

Applications have different requirements: languages, libraries, and tools

# The solution

Package applications as units of software that hold together all the needed components



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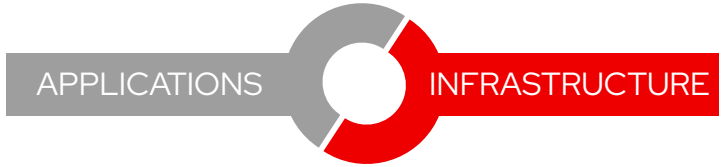
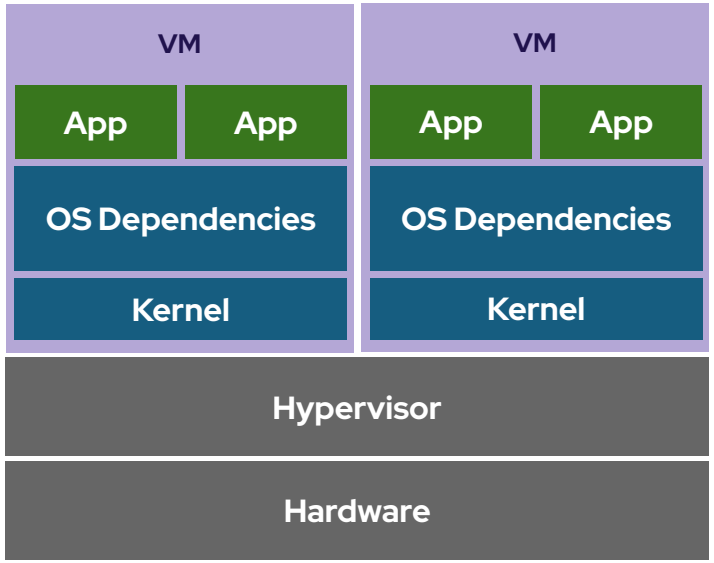


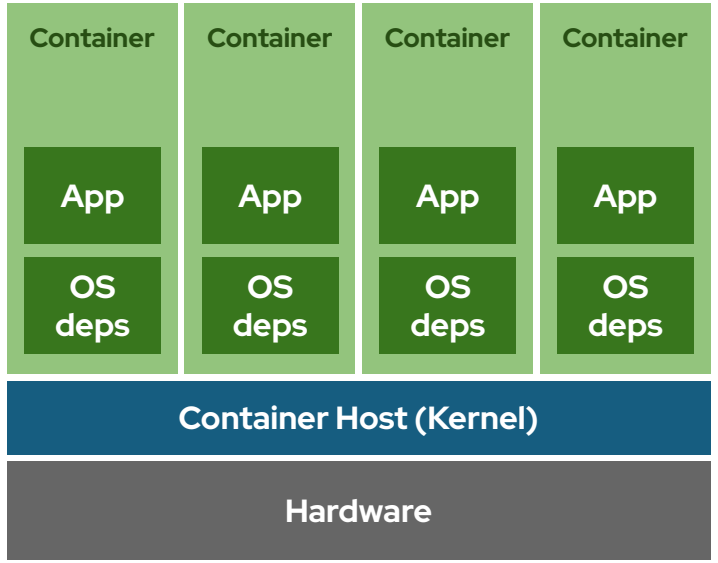

# The problem

VMs are “heavy” and usually **not** portable across hypervisors




# The solution

Isolated **processes** on a shared kernel (using Linux technologies)



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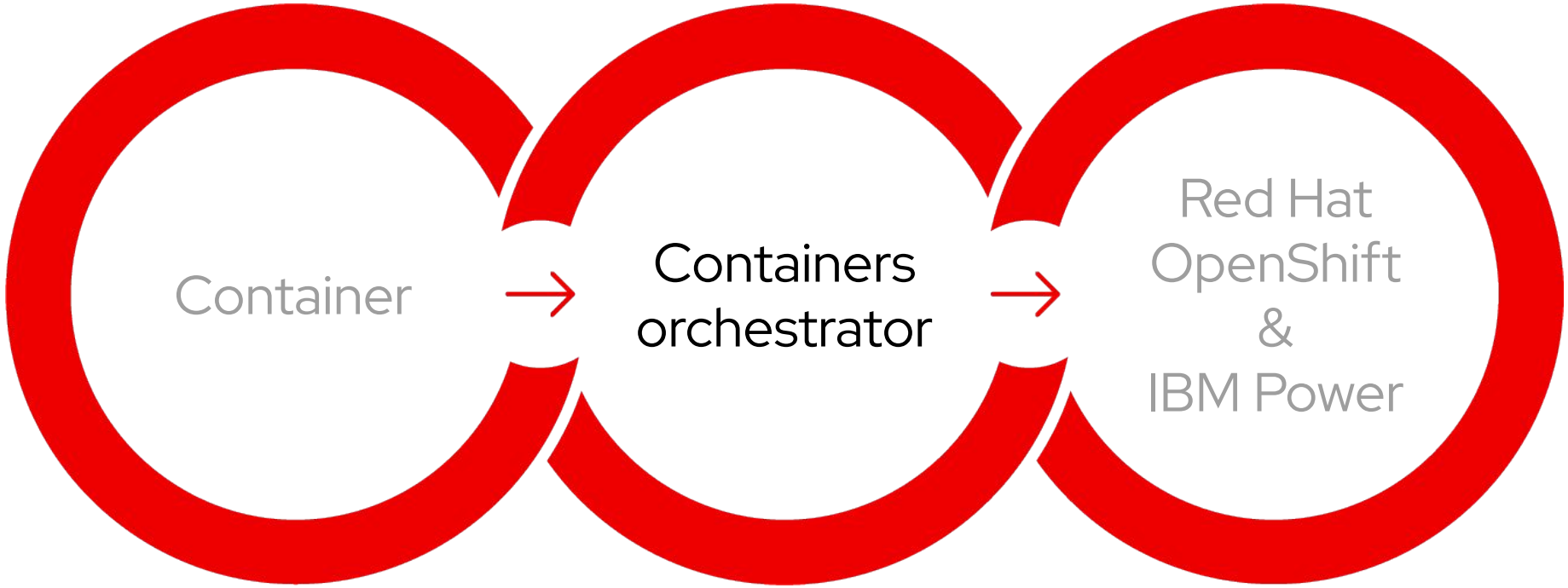
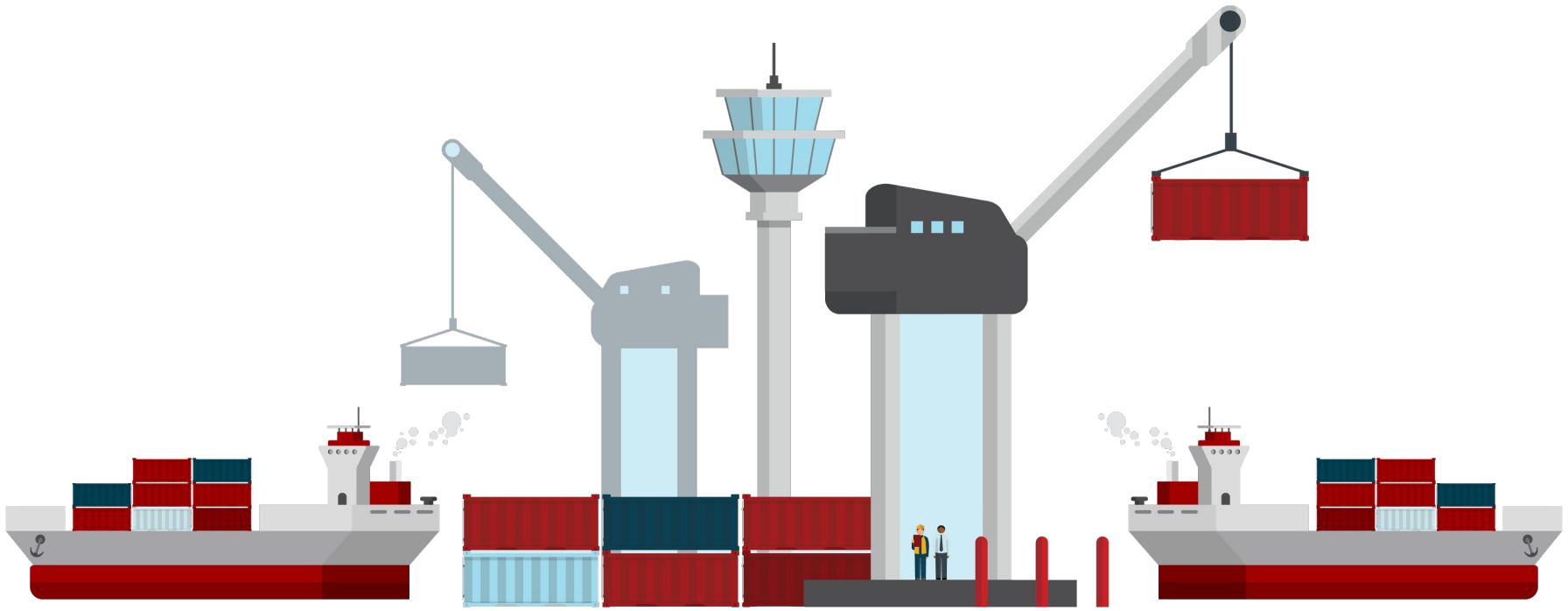
# DEMO 1

## Create and run a container locally

# What we'll discuss

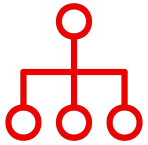


# How to manage containers at scale ?



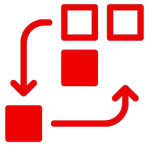
# How to manage containers at scale ?

Service discovery



Load balancing

Storage orchestration



Automated rollouts and rollbacks

Self-healing

Secret and configuration management

# How to manage containers at scale ?

Use a containers *orchestrator*

kubernetes

# Kubernetes objects

## Entities representing the state of the orchestrator


Pod : unit of computing (group of one or more containers)


Deployment : set of identical Pods (replicas of the same app)


Service : way to expose Pods over the network


PersistentVolume : unit of storage (“disk” that is usable by a Pod)


ConfigMap : way to set configurations in Pods


Secret :  way to store confidential data (ex. connection strings)

# Anatomy of a Kubernetes object

## Represented as a YAML file

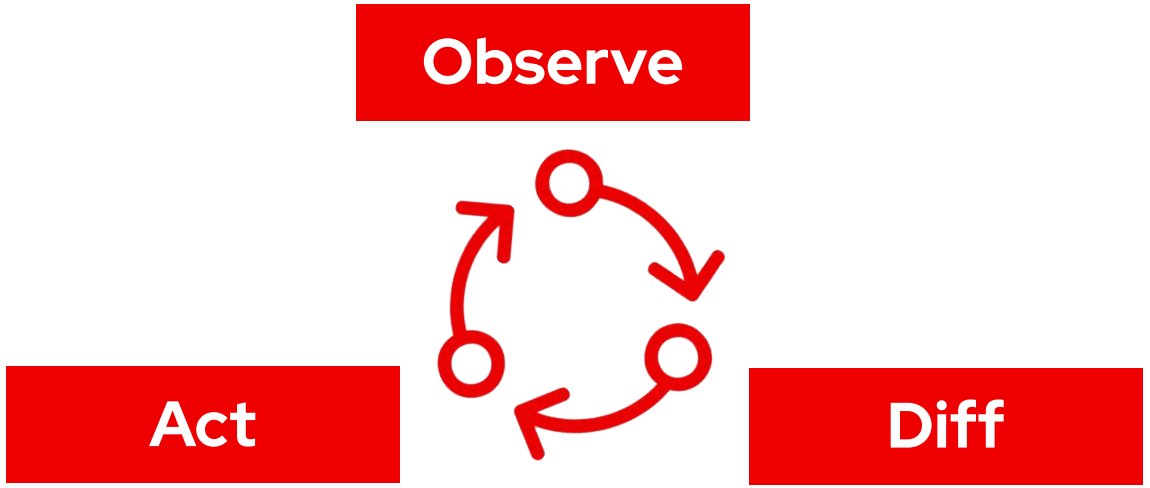
```yaml
apiVersion: v1
kind: Pod
metadata:
  name: demo-pod
  labels:
    app: http-server
spec:
  containers:
    - name: demo-container
      image: quay.io/…/demo-container:latest
       ports:
         - containerPort: 8000
```

# Reconciliation / Control loop

## A core Kubernetes concept

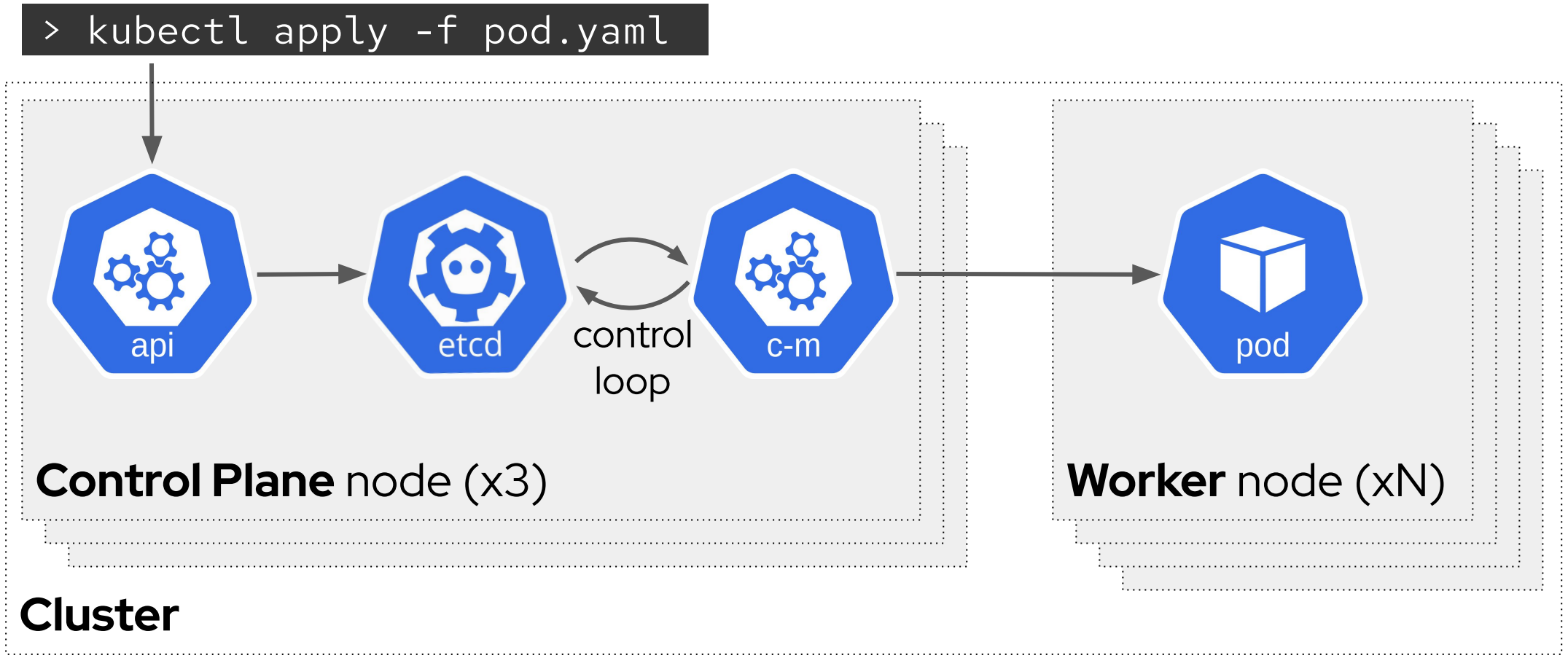
Kubernetes is based on the concept of a **declarative specification of the desired state**

and the **use of reconciliation loops** to **drive the actual state toward the desired state**



# Kubernetes architecture

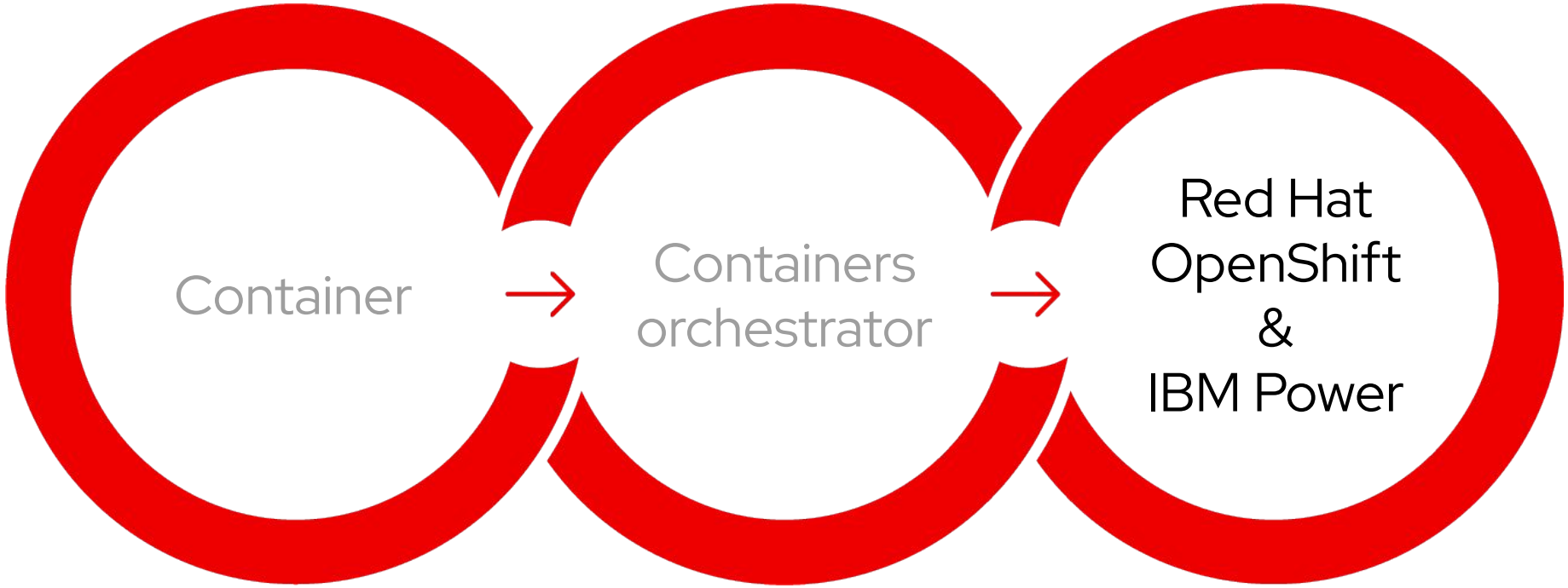
## Simplified view



# DEMO 2

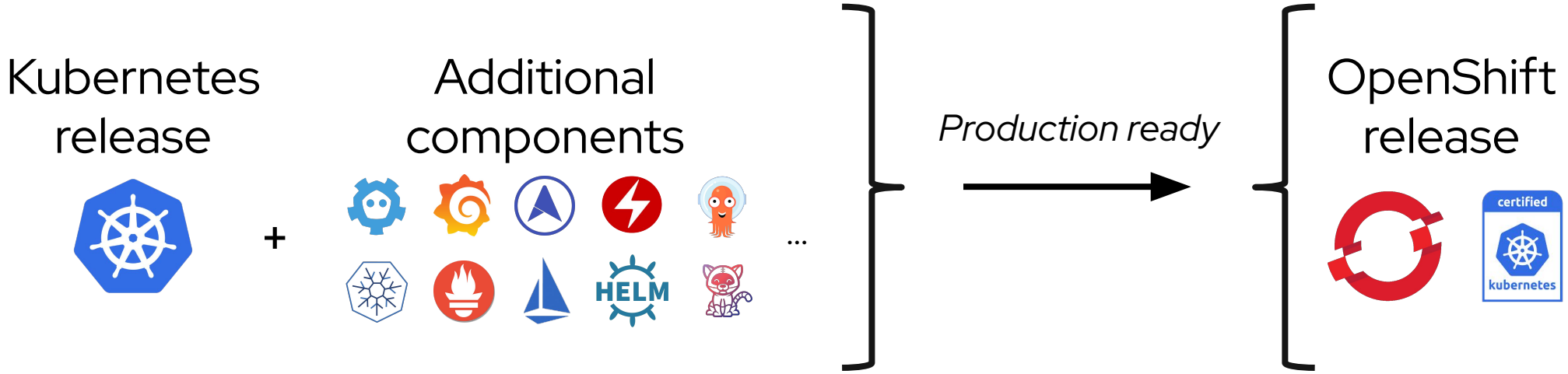
Create and run a pod on K8s

# What we'll discuss



# OpenShift Container Platform

## Trusted, comprehensive, and consistent platform to develop, modernize, and deploy applications at scale




*Red Hat is a leading Kubernetes contributor since day 1, and a major contributor to most CNCF projects*



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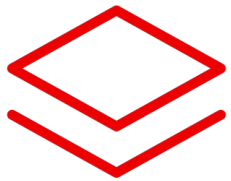
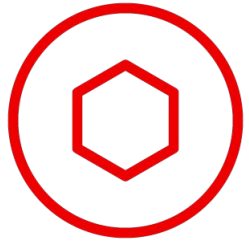
# Red Hat Enterprise Linux CoreOS

## The default operating system for all OCP cluster nodes



Based on **RHEL**

Controlled **immutability**



**Container**-centric

# OpenShift on IBM Power

## Securely build new OpenShift apps adjacent to data on AIX, IBM i


- **Incremental modernization**: value delivered as you go
- **Performance and scalability**: leveraging the POWER processors
- **Enhanced security**: hardware-based encryption, secure boot, and memory isolation capabilities
- **Reliability and availability**: redundant components, error correction and dynamic resource allocation
- **AI capabilities**: integrated accelerators



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# DEMO 3

## Microservices app on OCP on Power

# Thank you

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