

Understanding the building blocks of a container based and enterprise grade PaaS



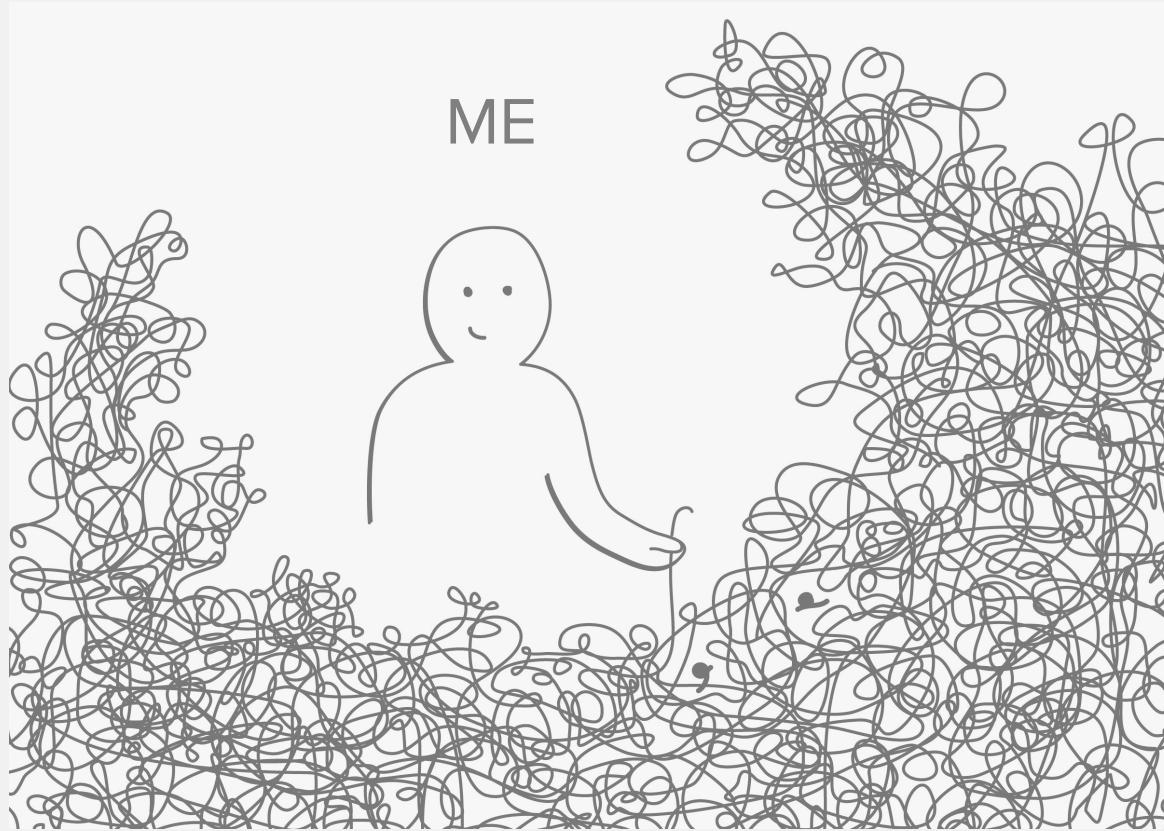
Magnus Glantz
Solution Architect
Red Hat



@OpenShift



RHOpenShift



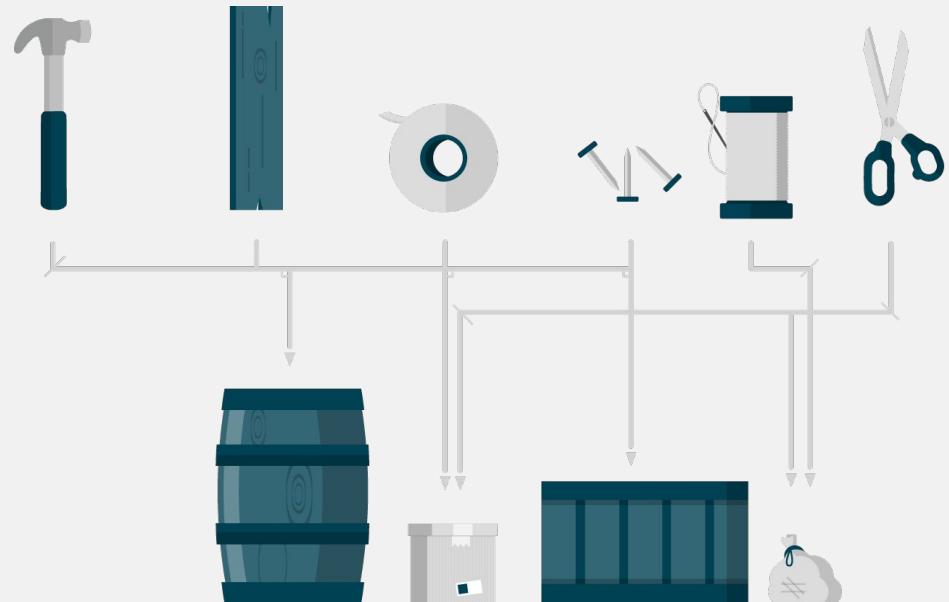
A photograph showing a massive stack of shipping containers at a port. The containers are stacked high, filling the frame. They are primarily white and blue, with some green ones interspersed. The perspective is from a low angle, looking up at the towering stack. In the background, industrial structures like cranes and other shipping containers are visible under a clear sky.

Problems and solutions

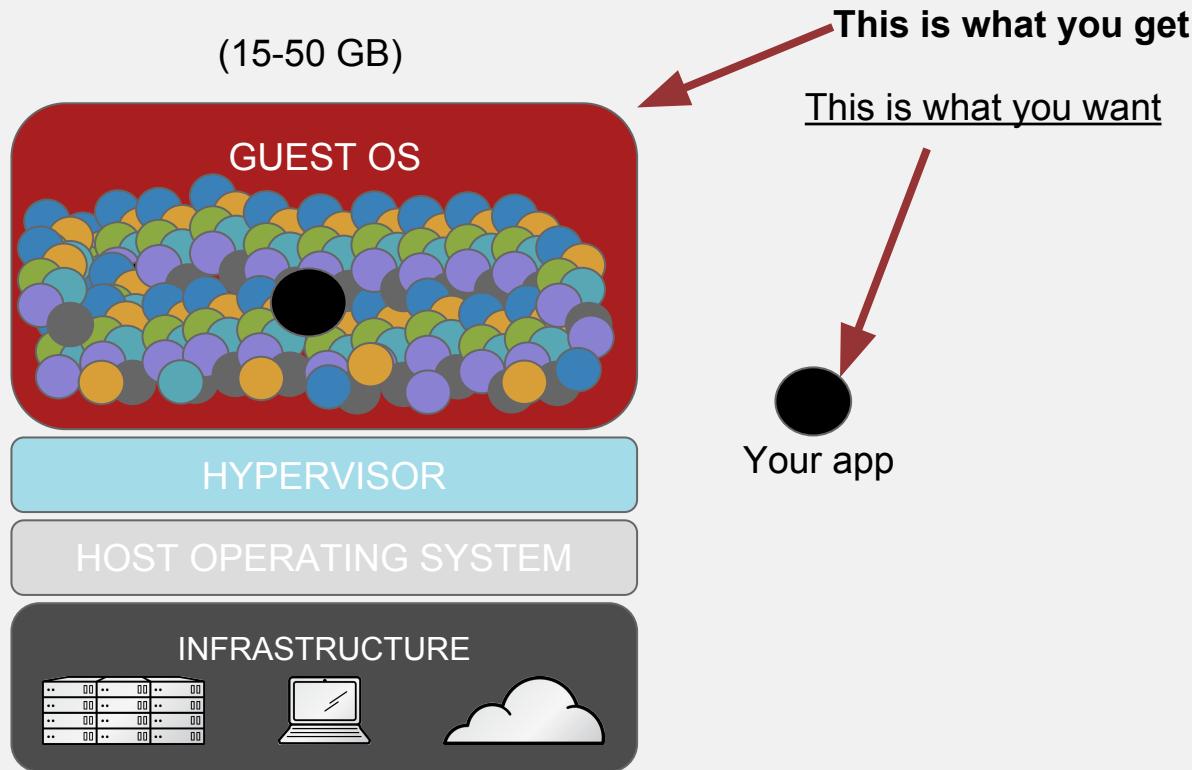
THE PROBLEM

Different applications delivered to IT:

- Have different requirements
- Use different languages, databases, and tools.

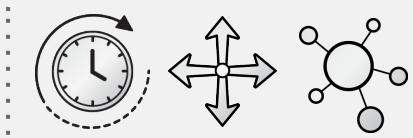


THE PROBLEM



THE PROBLEM

This is what they
want



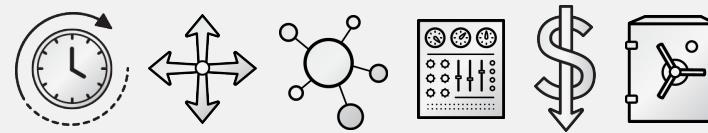
DEVELOPERS



OPERATIONS

THE PROBLEM

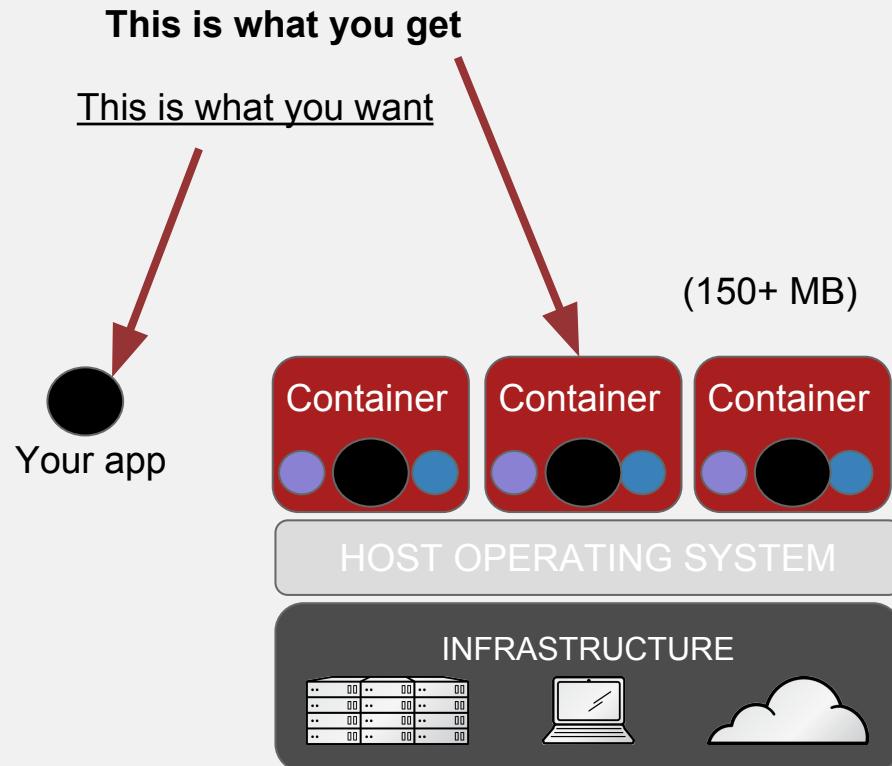
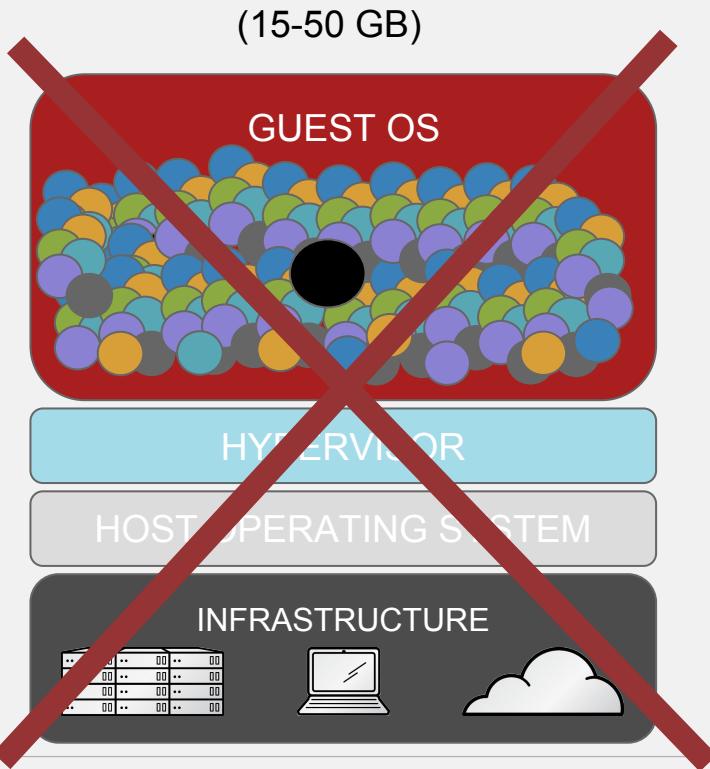
This is what you need



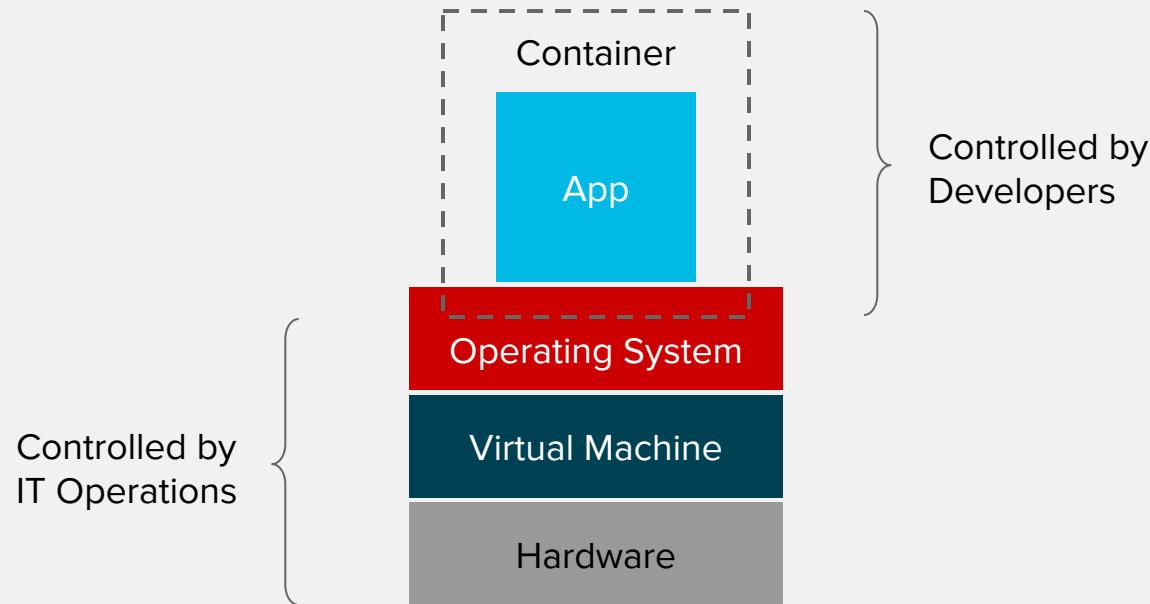
to



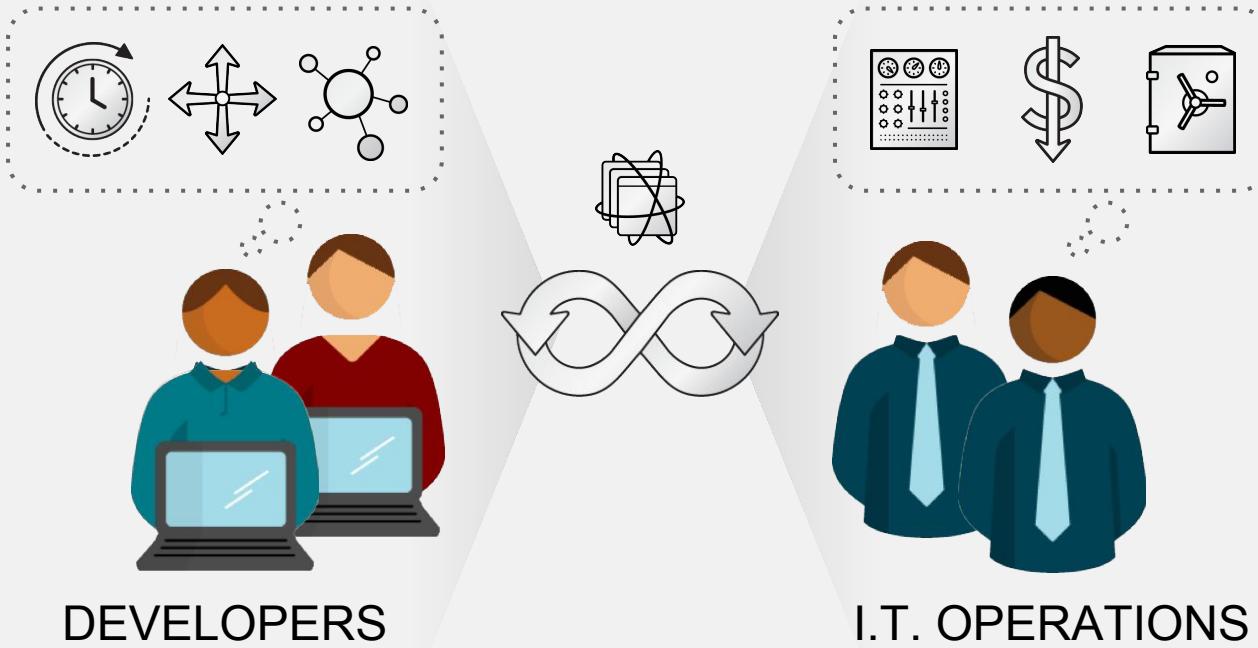
THE SOLUTION



CLEAR BOUNDARIES



COMMON LANGUAGE

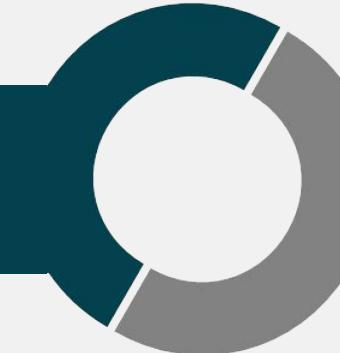


WHAT ARE CONTAINERS?

It Depends Who You Ask

INFRASTRUCTURE

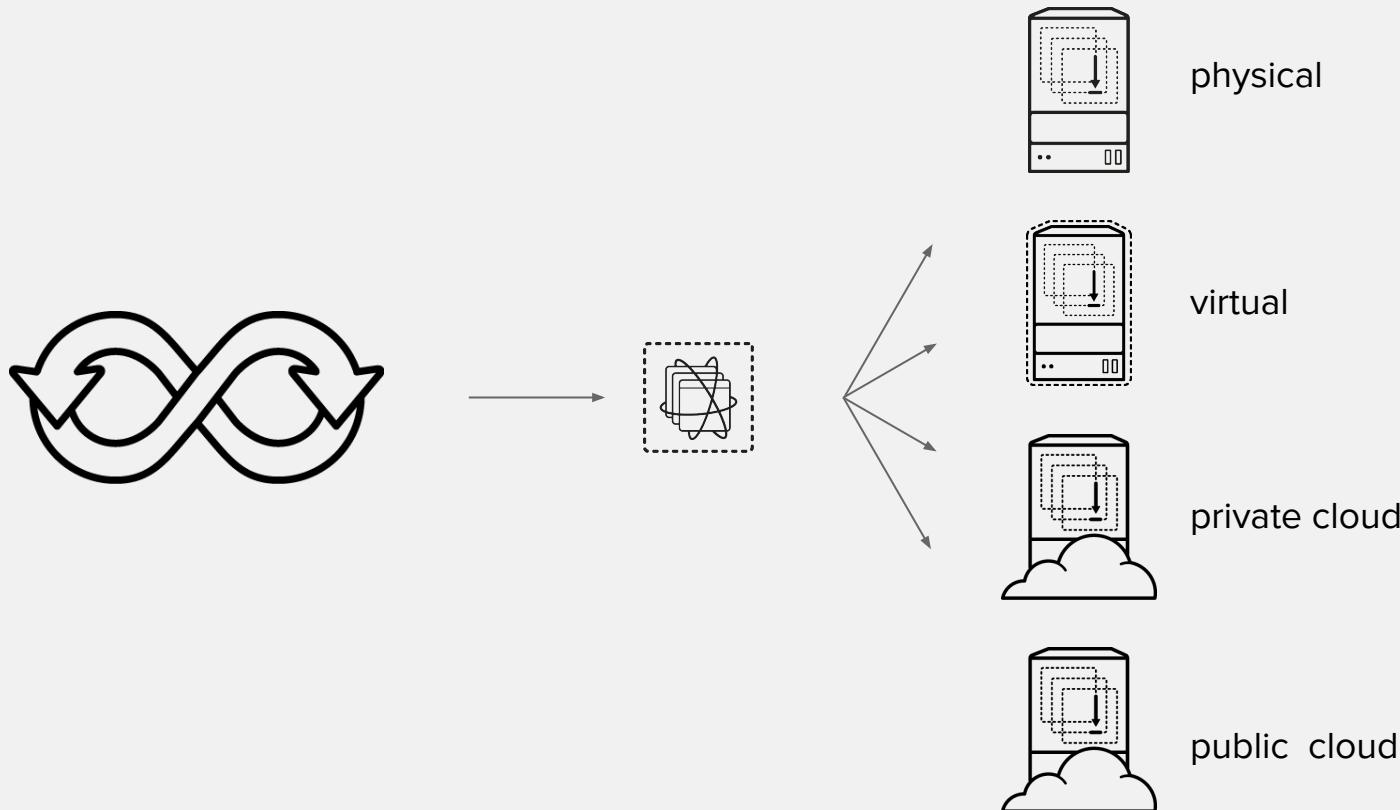
APPLICATIONS

- 
- Sandboxed application processes on a shared Linux OS kernel
 - Simpler, lighter, and denser than virtual machines
 - Portable across different environments
 - Package my application and all of its dependencies
 - Deploy to any environment in seconds and enable CI/CD
 - Easily access and share containerized components

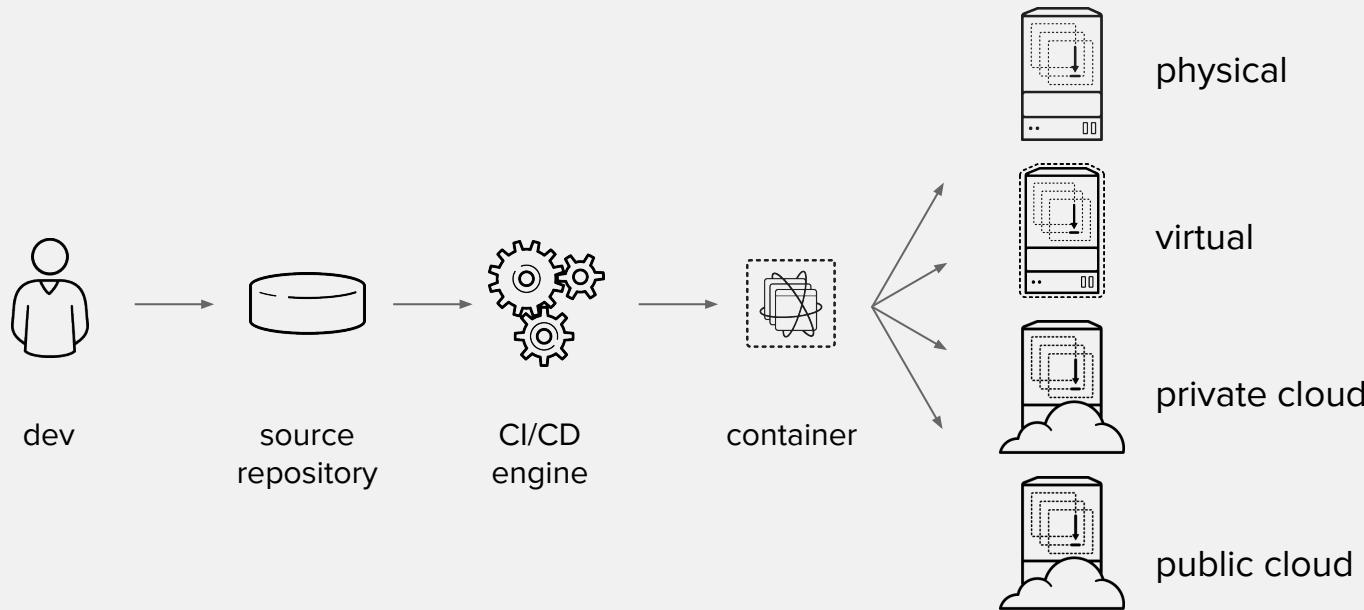
```
$ docker build -t app:v1 .
```

```
$ docker run app:v1
```

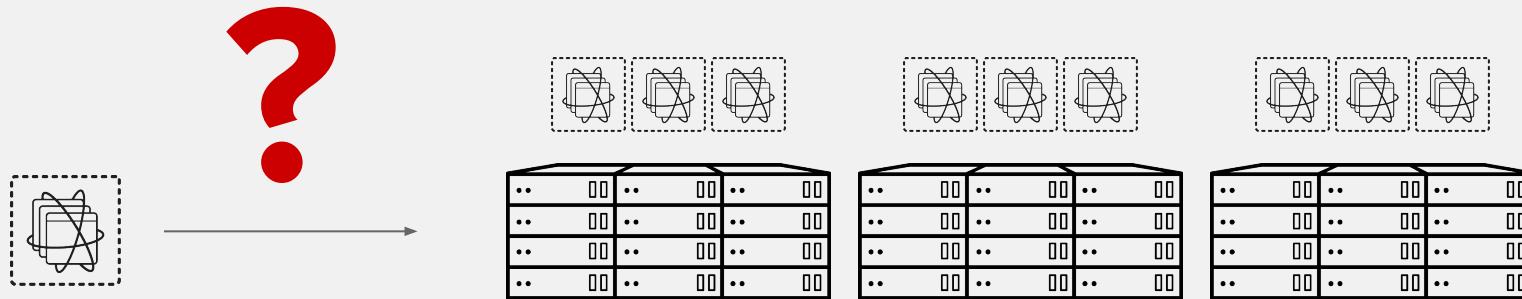
BUILD ONCE DEPLOY ANYWHERE



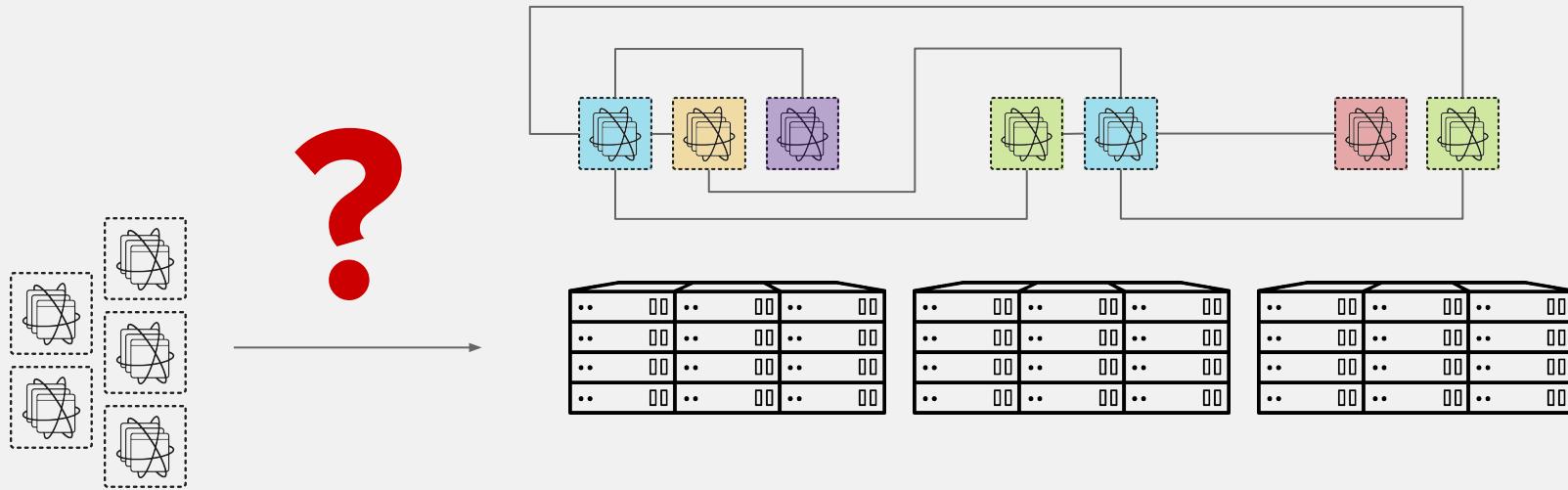
DEVOPS WITH CONTAINERS



DEVOPS WITH CONTAINERS AT SCALE: 1 APP = n Containers



DEVOPS WITH CONTAINERS AT SCALE



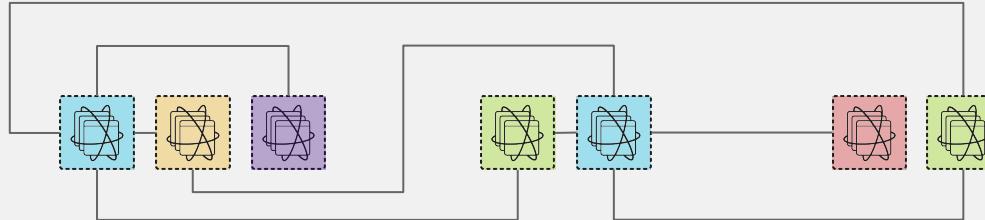
A photograph of a large stack of shipping containers in a port terminal. The containers are stacked high, filling the frame. In the background, industrial structures like cranes and other shipping containers are visible under a clear sky.

Understanding enterprise grade container PaaS

ENTERPRISE CONTAINER PAAS: Scheduling

Where to put things?

- Matching process
- Availability zones
- Security zones

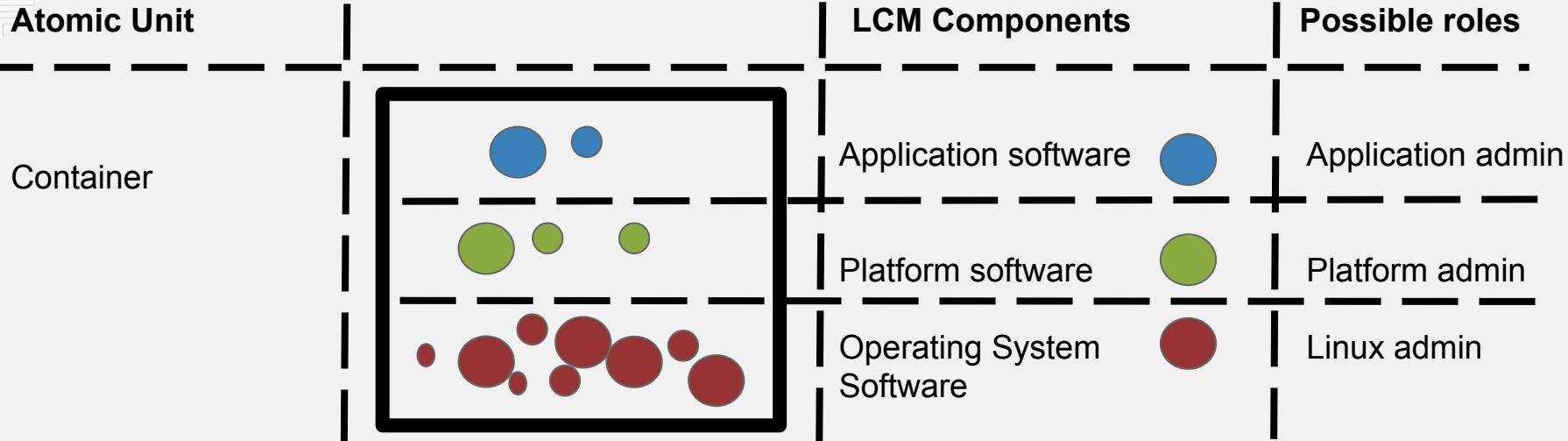


When to put things where?

- Affinity & anti-affinity
- Status based decisions



ENTERPRISE CONTAINER PAAS: Life Cycle Management



- Different layers has different life cycles
- Different layers can have different people and or teams responsible
- Different people have different priorities
- Not only security at stake, also availability
- **Need for synchronization!**

ENTERPRISE CONTAINER PAAS: Life Cycle Management

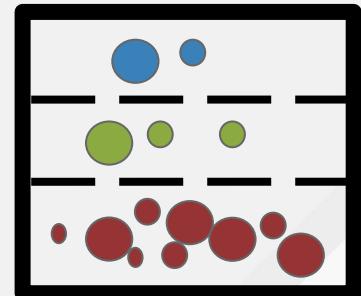
Obligatory communicated Life Cycle Management plans that includes

- Release plan
- Release strategy
- LCM Dependencies
- Upcoming major features
- Possible disruptive developments

LCM Strategy

Life Cycle Management support software

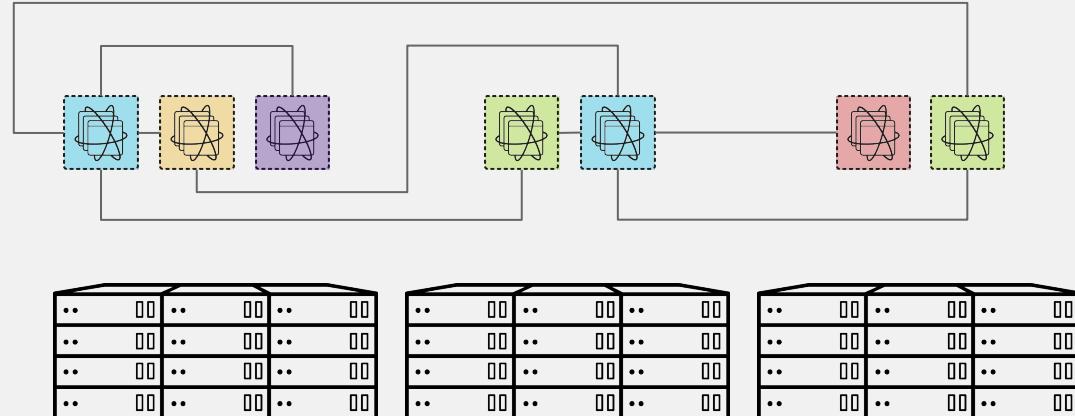
- Who are consuming what?
- What is the current LCM state?
 - What versions of software are running where?



ENTERPRISE CONTAINER PAAS: Discovery

Related challenges

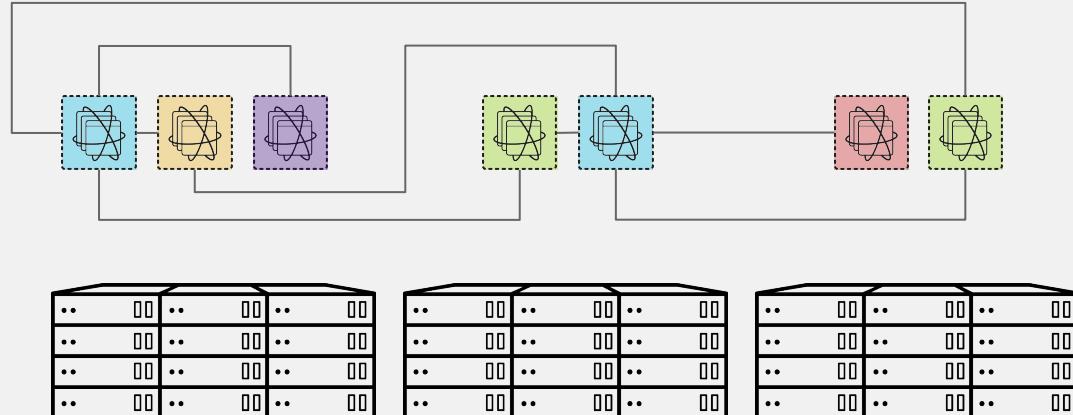
- IP addresses
- DNS names
- Load balancing
- Integration with external systems



ENTERPRISE CONTAINER PAAS: Monitoring

Related challenges

- Metrics & logging
- Intrusive tools
- Creation of new containers
- When containers or even nodes goes down, this may be normal operations.



ENTERPRISE CONTAINER PAAS: Supportability

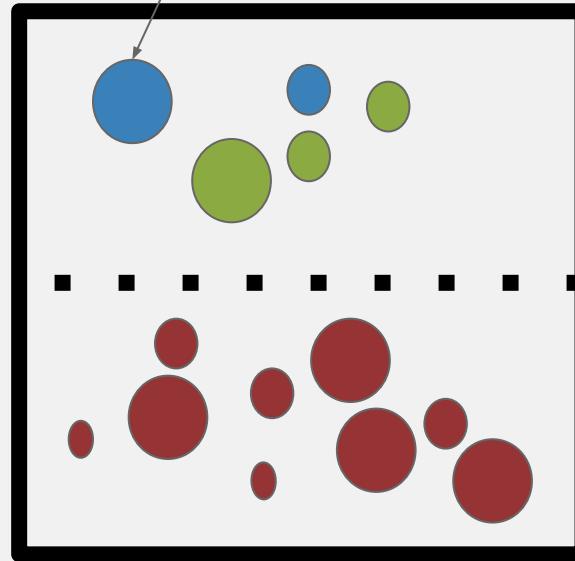
Related challenges

- Availability
- Security
- SLA/OLA

-Hello dear vendor, I created a hybrid operating system and have a critical problem with something...

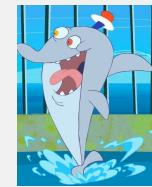
What? No support?

Your business critical application



OS in container

Dolphin Linux



Red Hat Enterprise Linux

OS on
container node



ENTERPRISE CONTAINER PAAS: **Supportability**

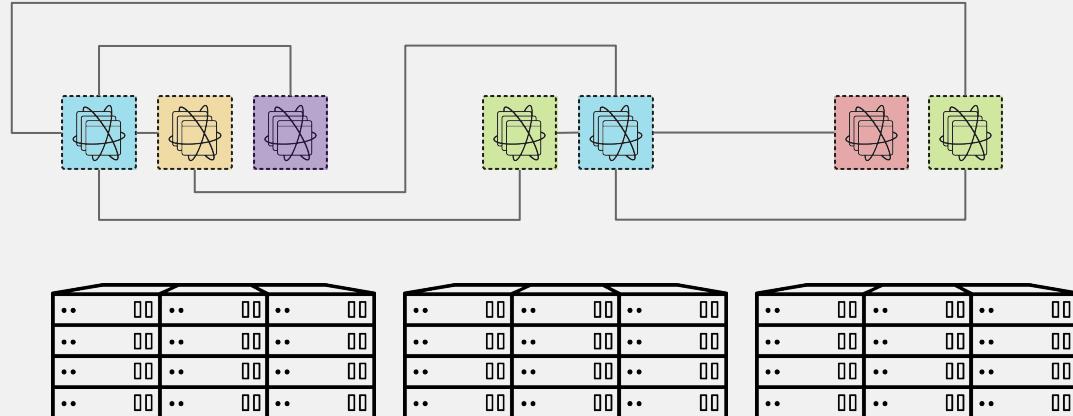
This also works, but it doesn't mean it's a great idea



ENTERPRISE CONTAINER PAAS: Storage

Related challenges

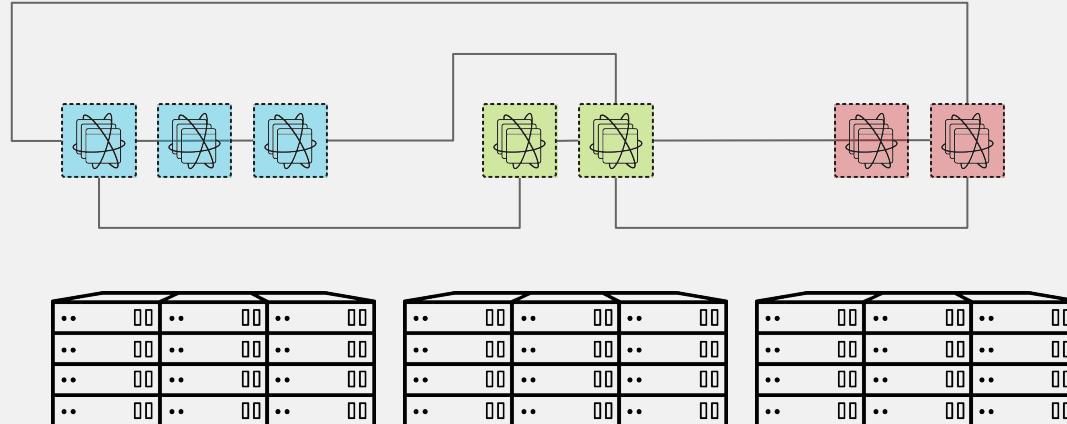
- Supporting a myriad of different storage solutions (aka performance issues)
- Automatic provisioning
- Tiering
- Hyper-converged software defined storage
- Scaling



ENTERPRISE CONTAINER PAAS: **Scaling**

Related challenges

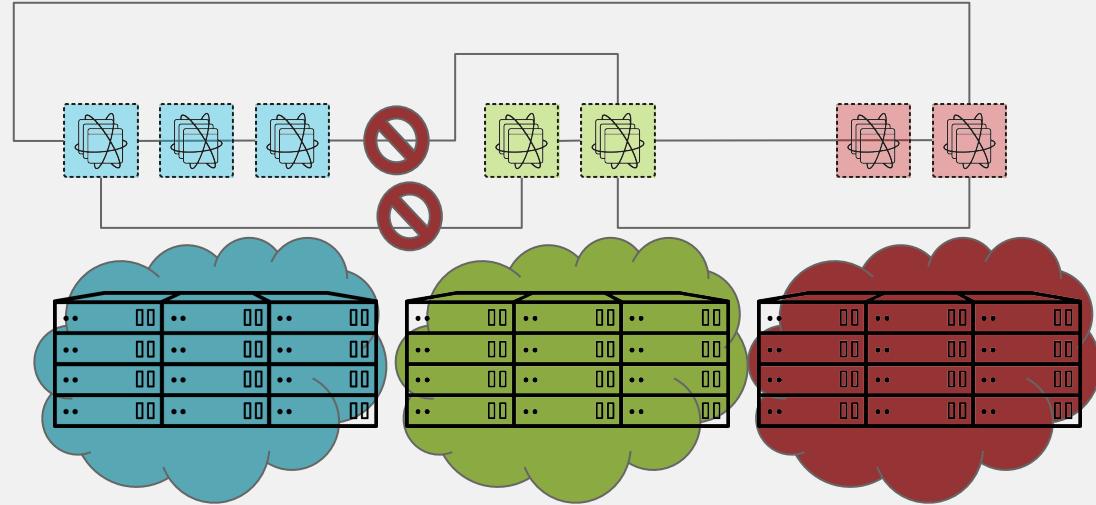
- Scaling across infrastructure
- Load balancing
- Storage
- Discovery
- Network
- Scaling the infrastructure (storage, network, container nodes, a.s.o.)



ENTERPRISE CONTAINER PAAS: Security

Related challenges

- Scheduling
- Quotas
- Building
- Network segmentation
- Container node safeguards
- Access controls (who can do what, separation of duty)
- Compliance (PCI DSS and more)
- Patching and auditing
- Logging



ENTERPRISE CONTAINER PAAS: Self service

Related challenges

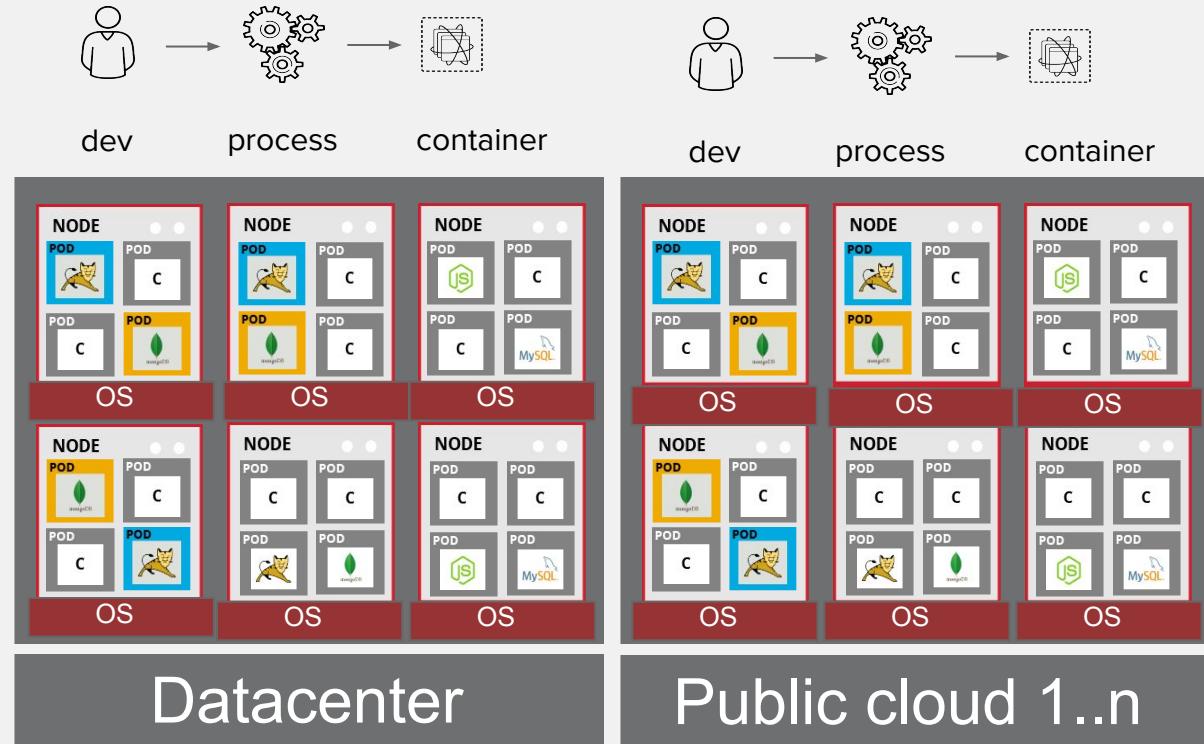
- Complexity
- GUI, API, CLI
- Service catalogue
- Chargeback
- Security (RBAC)
- Customization



ENTERPRISE CONTAINER PAAS: Consistency

Related challenges

- Poly hybrid cloud architecture
- Everything-as-code



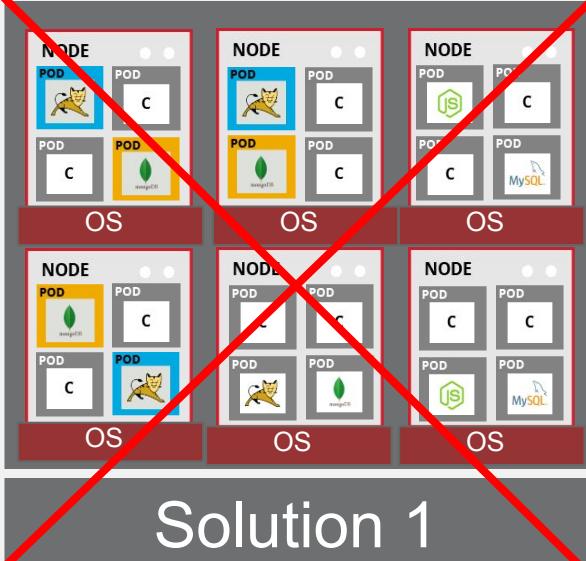
ENTERPRISE CONTAINER PaaS: Lock-in

Related challenges

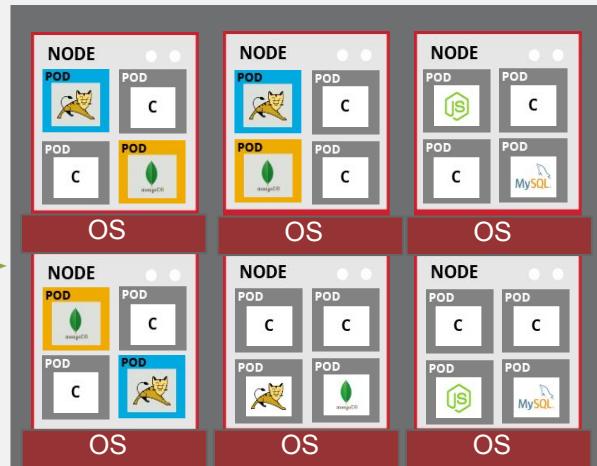
- Open Source
- Open Standards
- Does the solution stop working when you stop paying?

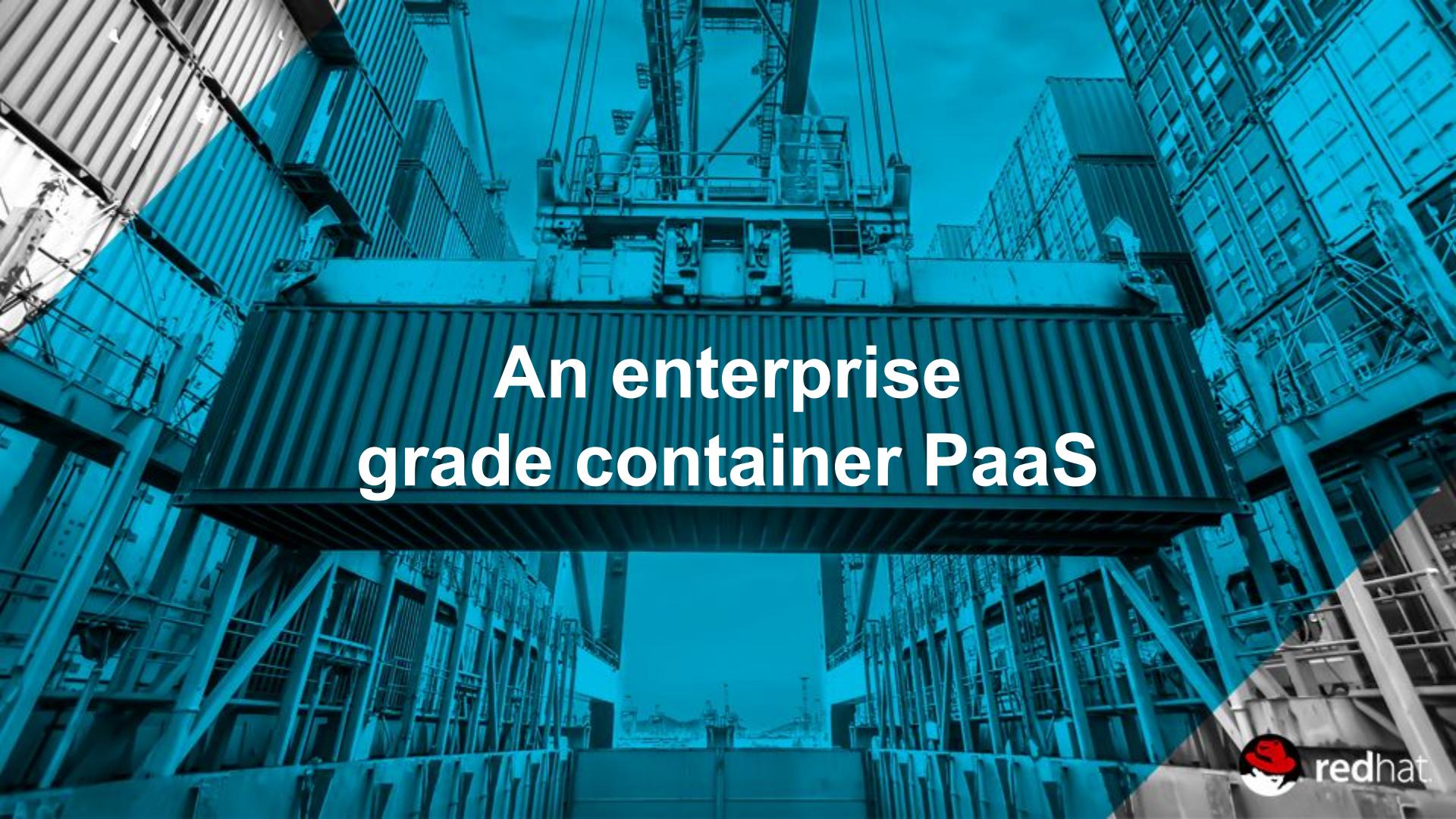


dev process container



dev process container





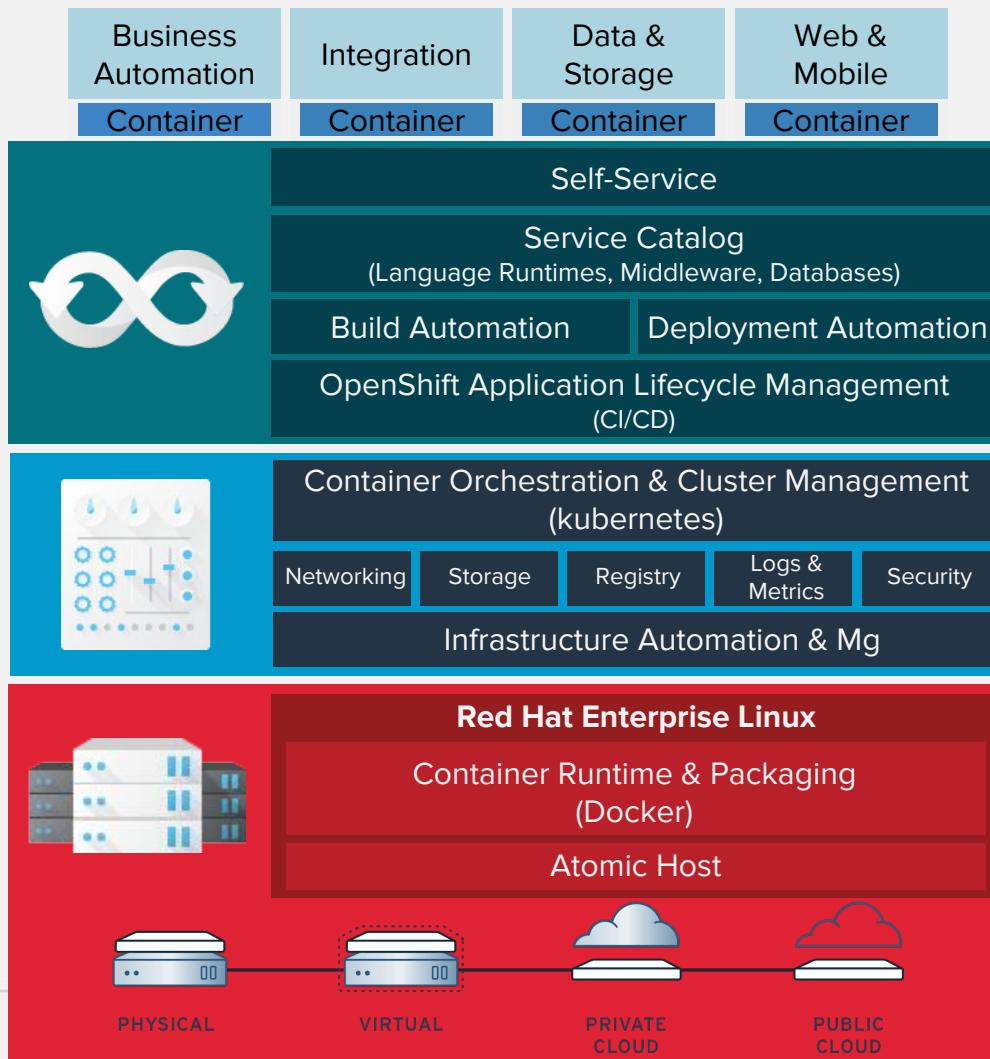
An enterprise grade container PaaS

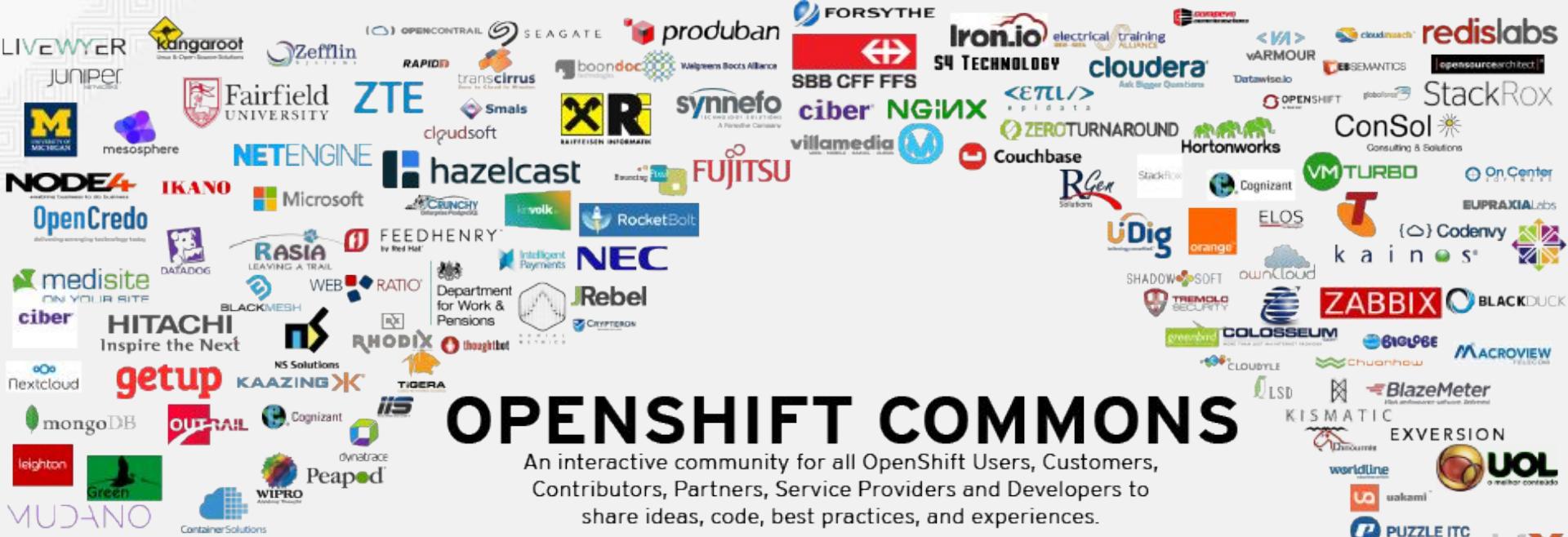


The industry's most secure
and comprehensive
enterprise-grade container
platform based on industry
standards, Docker and
Kubernetes.



Also, is there time for a
demonstration as well?





OPENShift COMMONS

An interactive community for all OpenShift Users, Customers, Contributors, Partners, Service Providers and Developers to share ideas, code, best practices, and experiences.

More at <http://commons.openshift.org>



A photograph showing a massive stack of shipping containers at a port. The containers are stacked high, filling the frame. In the background, industrial structures like cranes and other shipping containers are visible under a clear sky.

What to learn more?



<http://openshift.katacoda.com>



SIGN UP TO OPENSHIFT ONLINE FOR FREE



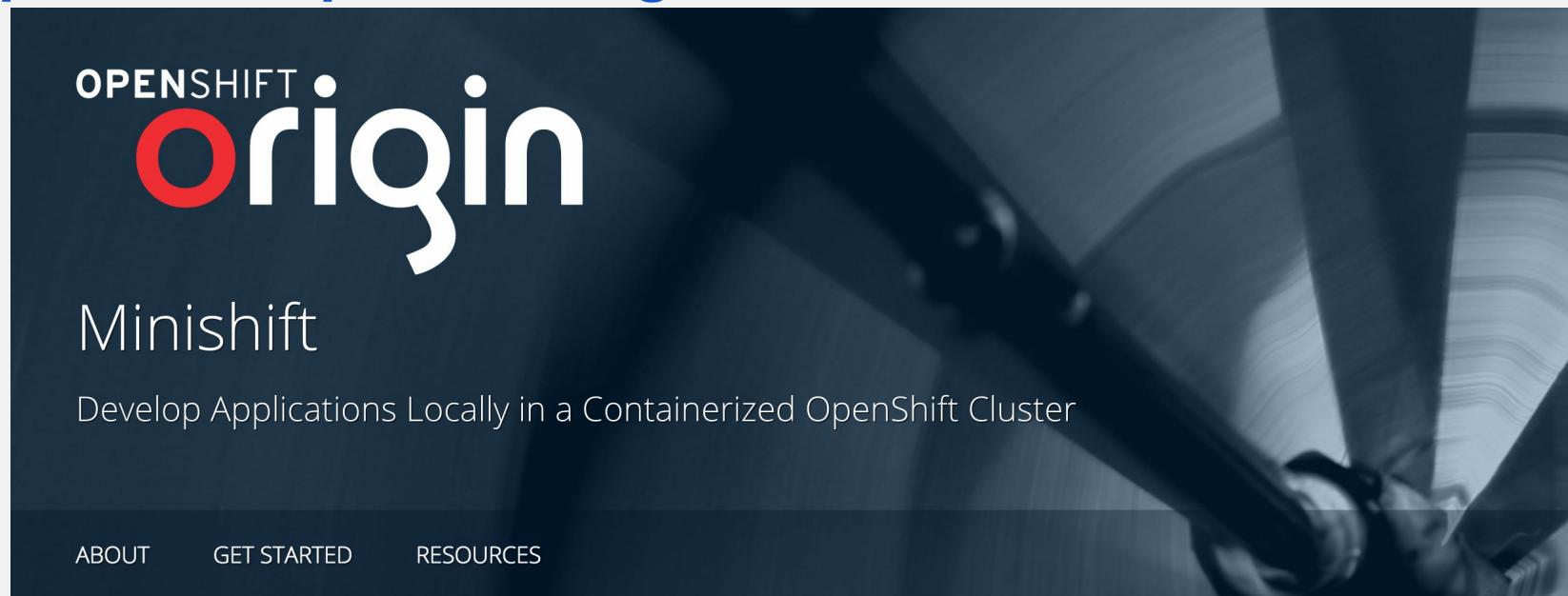
Interactive Learning Portal

Our Interactive Learning Scenarios provide you with a pre-configured OpenShift instance, accessible from your browser without any downloads or configuration. Use it to experiment, learn OpenShift and see how we can help solve real-world problems.

Getting Started with
OpenShift for
Developers

START SCENARIO

<https://www.openshift.org/minishift/>



The background of the page features a dark, slightly blurred photograph of a person sitting at a desk, viewed from behind. They are looking at a computer screen, with several other screens visible in the background, suggesting a developer or sysadmin environment.

OPENSIFT
origin

Minishift

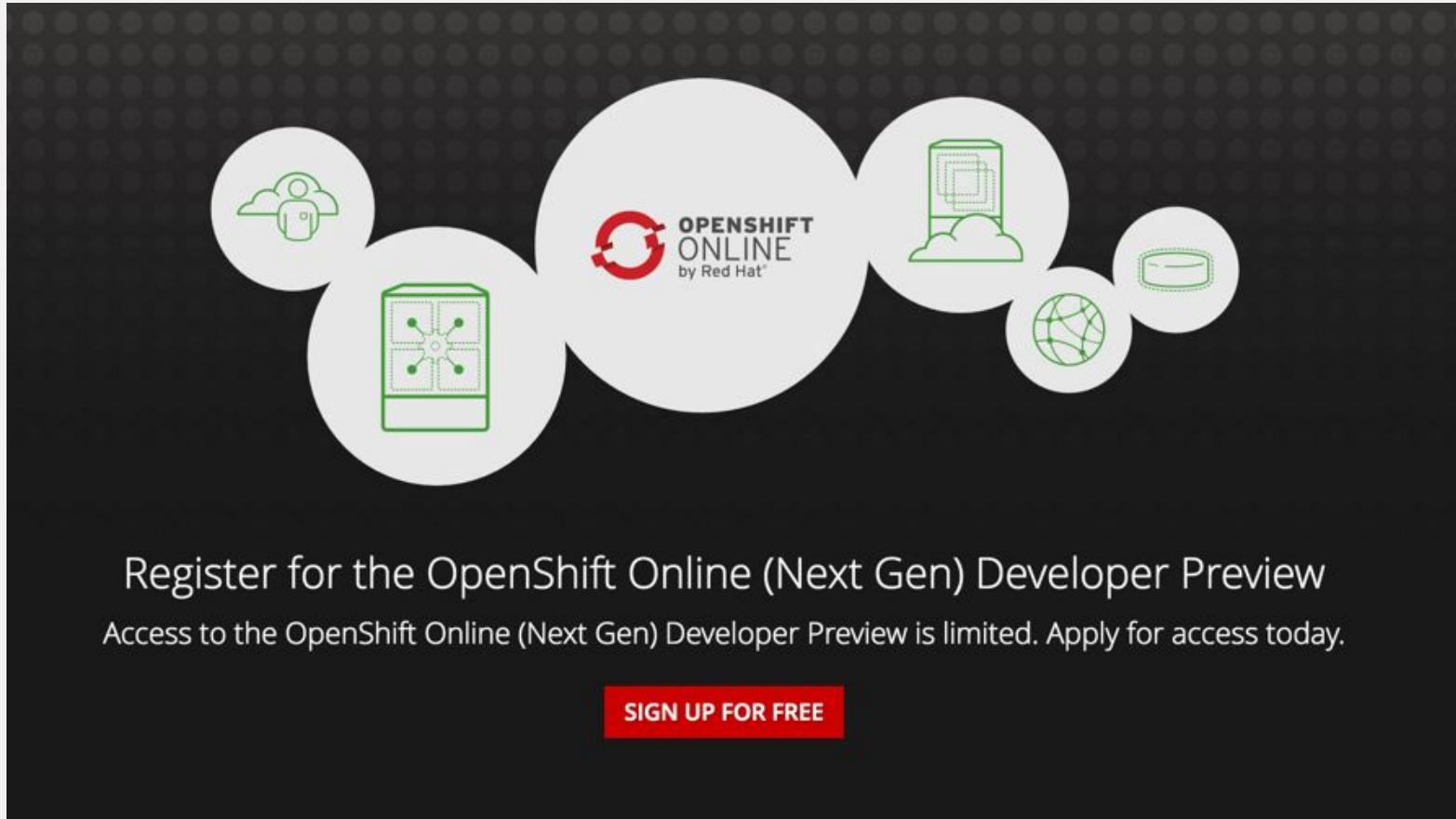
Develop Applications Locally in a Containerized OpenShift Cluster

ABOUT GET STARTED RESOURCES

Minishift is a tool that helps you run OpenShift locally by launching a single-node OpenShift cluster inside a virtual machine. With Minishift you can try out OpenShift or develop with it, day-to-day, on your local machine.

You can run Minishift on Windows, Mac OS, and GNU/Linux operating systems. Minishift uses [libmachine](#) for provisioning virtual machines, and [OpenShift Origin](#) for running the cluster.

<https://www.openshift.com/devpreview/>



The image shows a promotional landing page for the OpenShift Online (Next Gen) Developer Preview. At the top center is the OpenShift Online logo, which includes a red circular icon with a white gear-like symbol and the text "OPENSHIFT ONLINE by Red Hat". Surrounding the logo are several white circles containing green icons: a person with a backpack, a cloud, a server rack, a monitor displaying code, a globe, and a database. Below the logo, the text "Register for the OpenShift Online (Next Gen) Developer Preview" is displayed in a large, white, sans-serif font. Underneath this, a smaller line of text reads "Access to the OpenShift Online (Next Gen) Developer Preview is limited. Apply for access today." At the bottom center is a red rectangular button with the white text "SIGN UP FOR FREE". The background of the page is black with a subtle dotted pattern.

Register for the OpenShift Online (Next Gen) Developer Preview

Access to the OpenShift Online (Next Gen) Developer Preview is limited. Apply for access today.

SIGN UP FOR FREE

<https://install.openshift.com/>



OPENSIFT

Get ready to rock with OpenShift.

Origin / latest / Enterprise / 3.x

Pick the installation that's right for you.

Latest development release

`oc cluster up`

- Cross platform; Runs anywhere you can run Docker

Container Development Kit

`vagrant up (On Mac/Linux)`

(Run the [devsuite installer](#) exe on Windows)

- Most full featured all-in-one host environment
- Cross platform; Runs in a virtual machine
- Ideal for all levels of container experience

OpenShift Container Platform

`atomic-openshift-installer install`

- Enterprise grade, fully supported for production workloads in your datacenter or the cloud
- Highly configurable

Don't have access? Start a [free trial](#) today!

Need more help? We're here for you.

- The [OpenShift Enterprise Installation and Configuration Guide](#) is available at the [OpenShift Enterprise documentation site](#).
- Customers can open [support cases](#) as well as browse a wealth of subscribers only [solutions](#), [articles](#) and much more.
- Familiar with IRC? OpenShift superstars can be found on the [#openshift](#) and [#openshift-dev](#) channels on [FreeNode](#).
- You can also join the [Users](#) or [Developers](#) mailing list.

Red Hat Open Innovation Labs

MODERNIZE TRADITIONAL APPS

- Extend applications
- Optimize applications
- Scale applications
- Expose to orchestration

INNOVATION ACCELERATED

DEVELOP CONTEMPORARY APPS

- Develop on PaaS environment
- Transform how you design and develop apps
- Adopt lean and agile principles
- Master DevOps practices



COLLABORATION

Space to work,
innovate, and discuss



RESIDENCY

An eight-week accelerated
teaming engagement



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