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Univerzita Komenského v Bratislave

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serverless

SEGES space for solutions

ABOUT ME

- Luigi Fugaro
- EMEA Middleware Architect @RedHat
- And you can find me:
  - @foogaro
  - @foogaro
  - @foogaro
  - @foogaro

That's me

Internet

OPENSLAVA'18

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Name: OpenSlava
Password:Open2018
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Agenda

- Presentation
- Lab
- Q/A

Agenda

- Presentation
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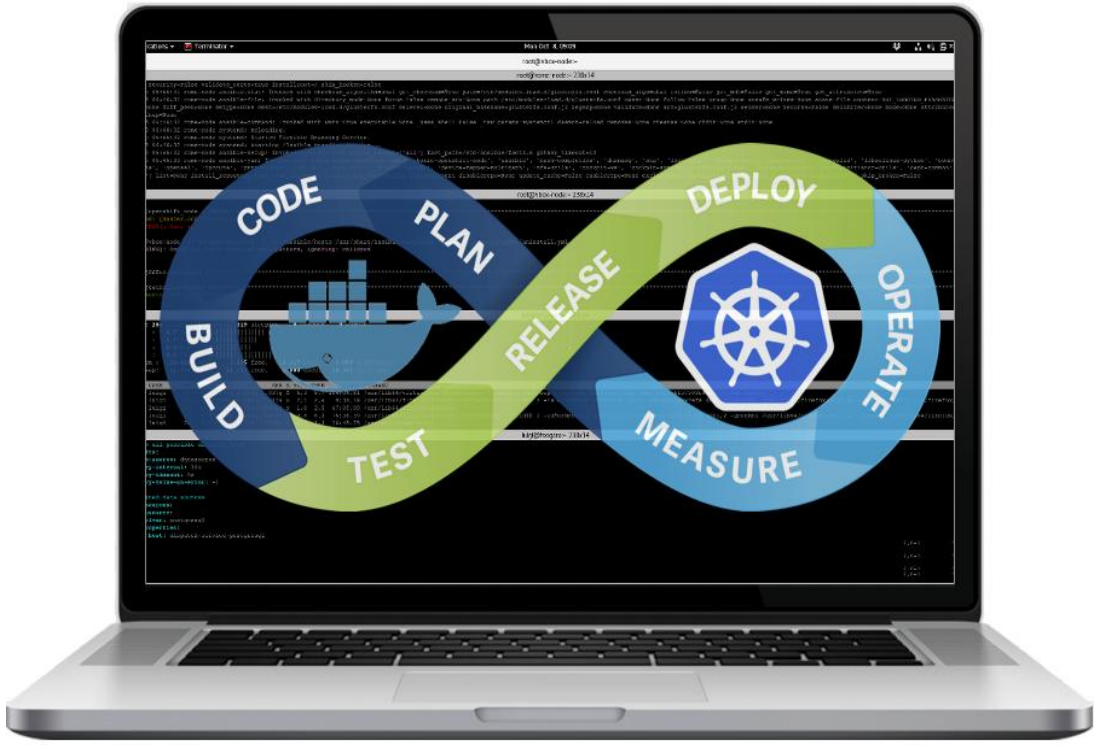

Agenda

- Presentation
- Lab
- Q/A

Cloud Native Applications

Why?

- We need to scale
- Cloud scales by design and definition

Cloud Native Applications

How?

- Containers
- Orchestrator

Cloud Native Applications

The problem

- Monolith applications
- Applications are stateful
- Applications need to be scale-aware

Cloud Native Applications

Solution

- 12-factor applications
- Microservice approach
- Enterprise support

Cloud Native Applications

12-Factor application

Cloud Native Applications

12-Factor application

1. Codebase
2. Dependencies
3. Configuration
4. Backing Services
5. Build, Release, Run
6. Processes
7. Port Binding
8. Concurrency
9. Disposability
10. Dev/Prod Parity
11. Logs
12. Admin Processes

Cloud Native Applications

12-Factor application

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Cloud Native Applications

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14. ???

Cloud Native Applications

12-Factor application

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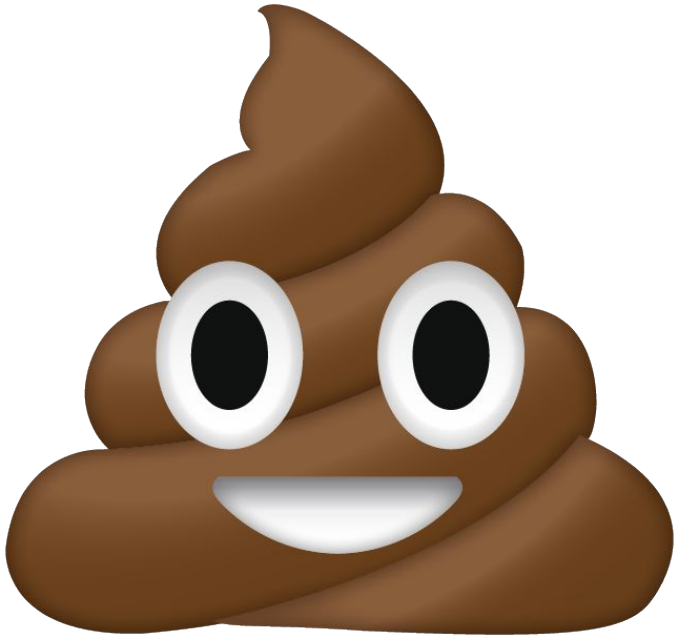
12. Admin Processes
13. Security
14. Next…

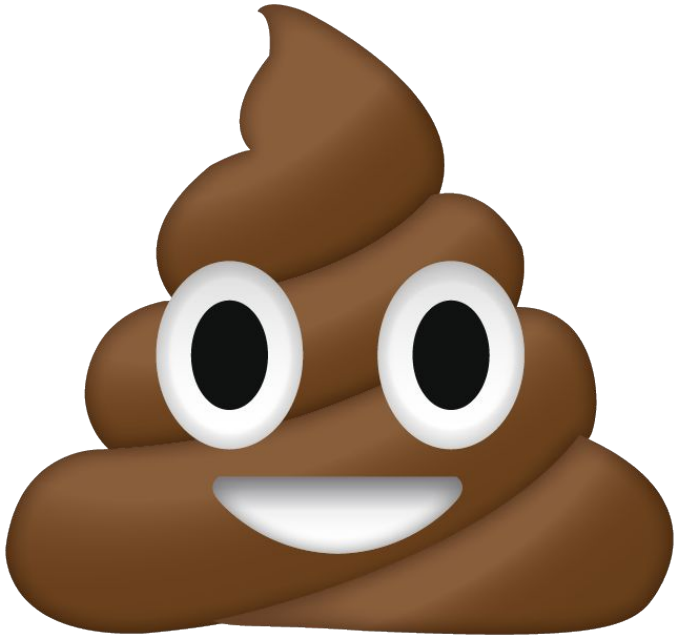
Cloud Native Applications

Monolith



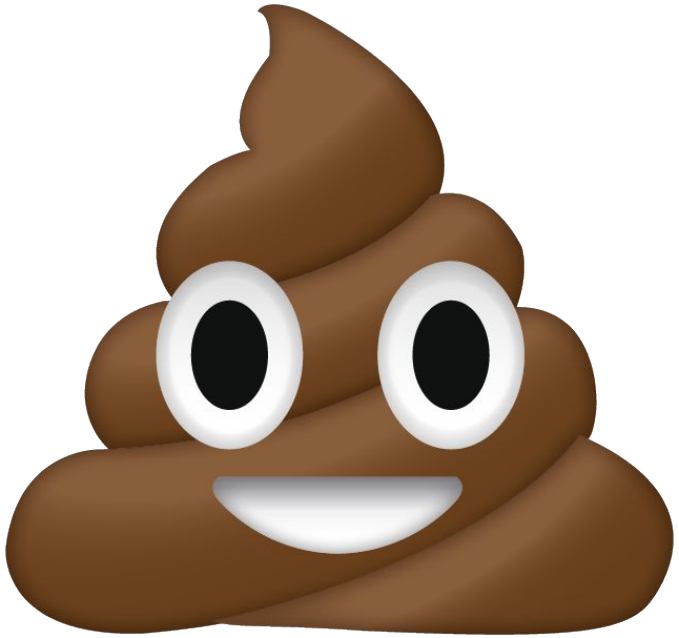
Cloud Native Applications

Monolith

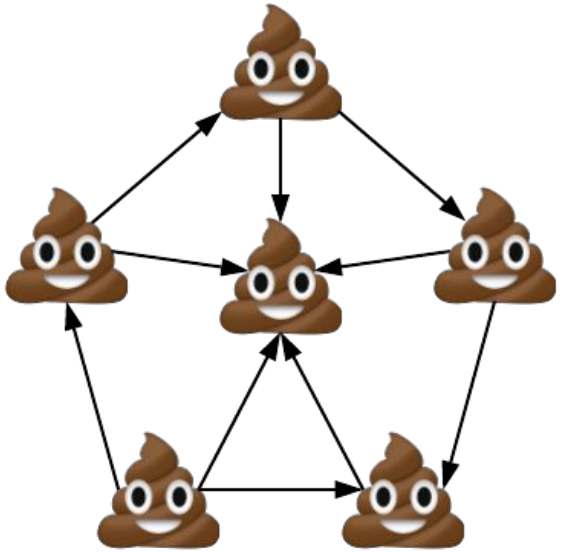


Cloud Native Applications

Monolith



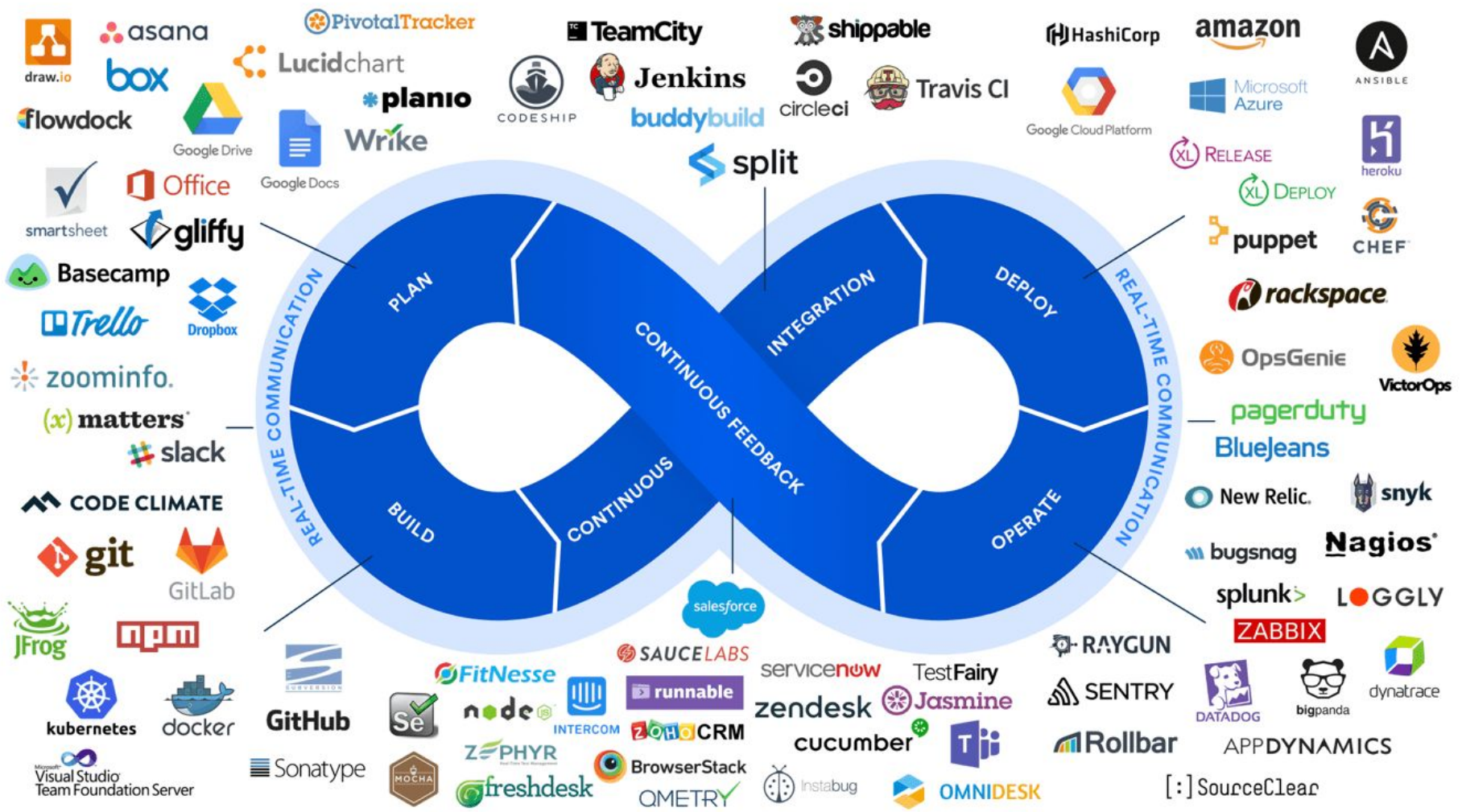
Microservices



Cloud Native Applications

The right tool for the right job

Cloud Native Applications

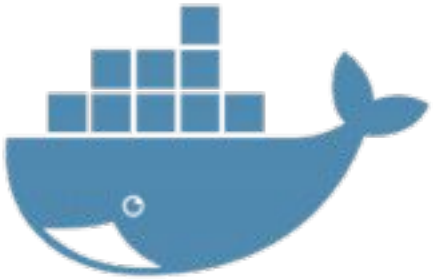


Cloud Native Applications

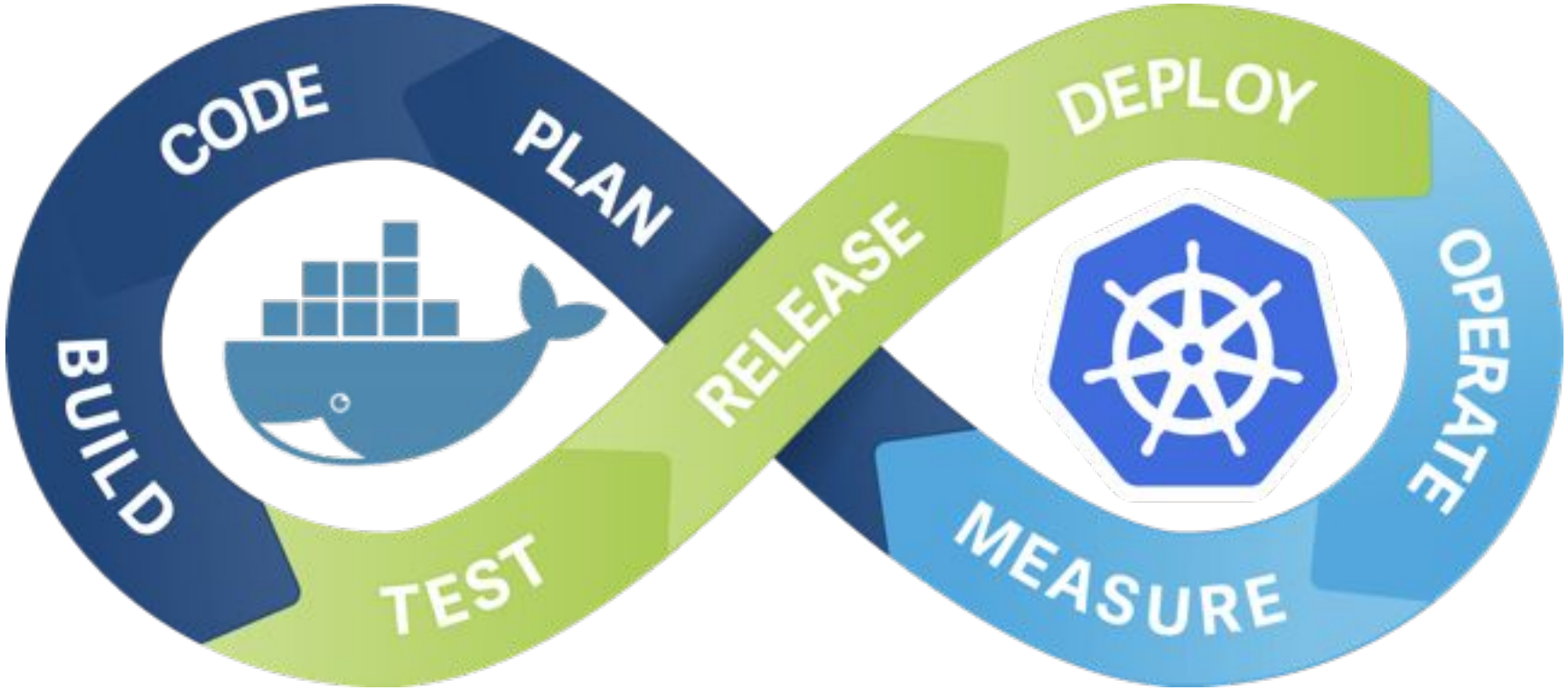
Which are the de-facto standards in terms of DevOps?

(hopefully opensource)

Cloud Native Applications



Cloud Native Applications



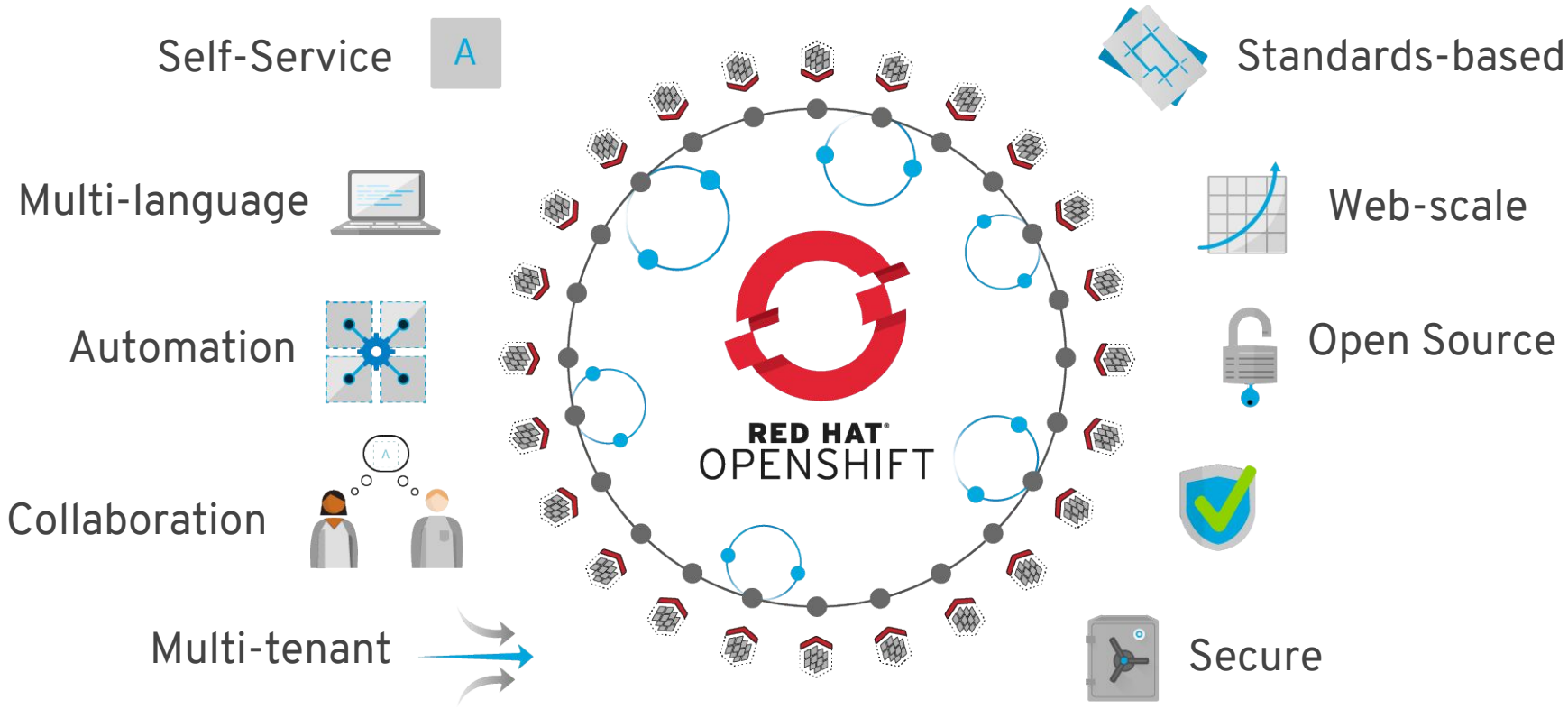
Cloud Native Applications

Do we have a platform that merges the right tool for the right job?

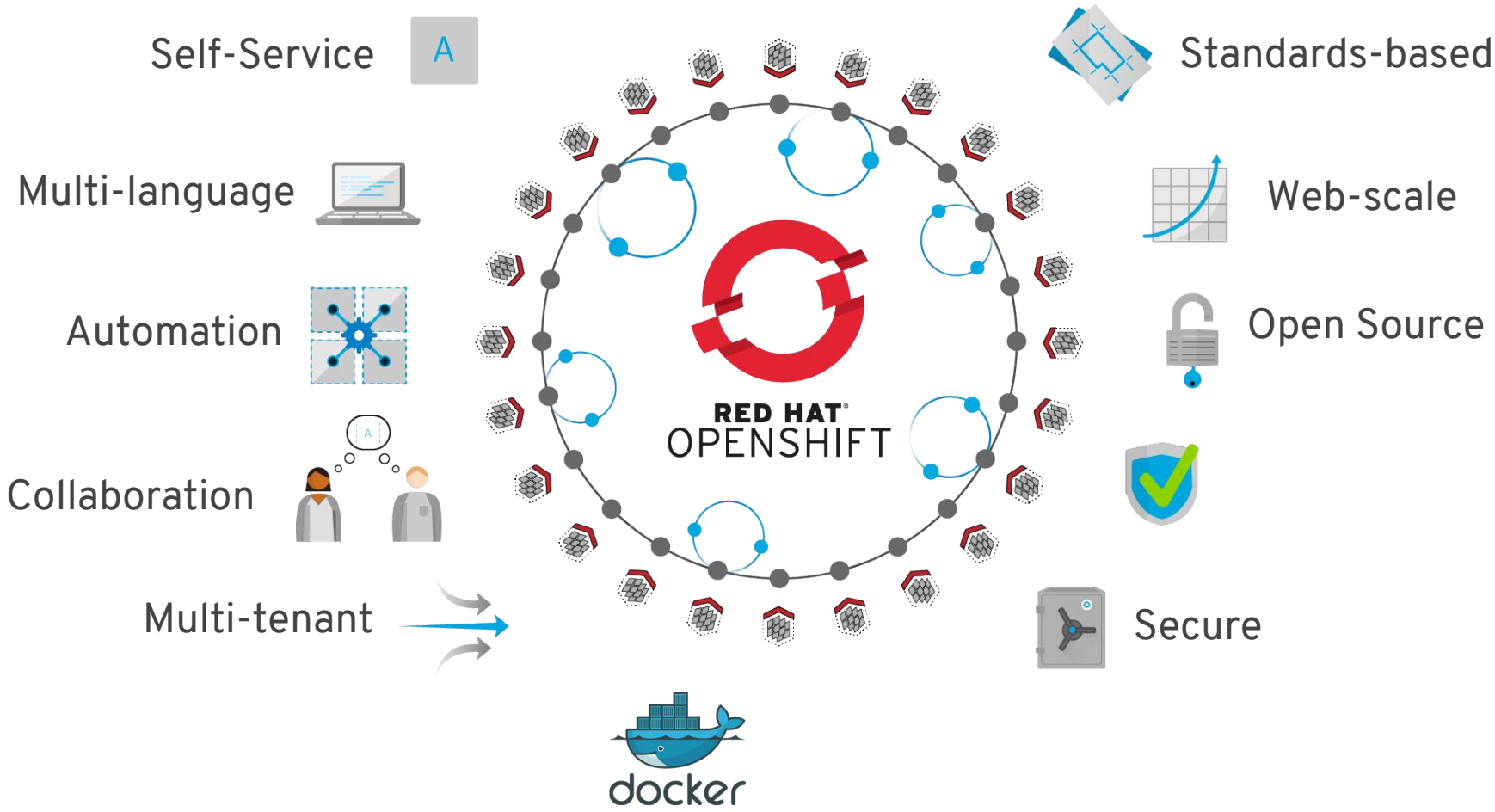
Cloud Native Applications

RED HAT®
OPENSHIFT
Container Platform

Cloud Native Applications



Cloud Native Applications



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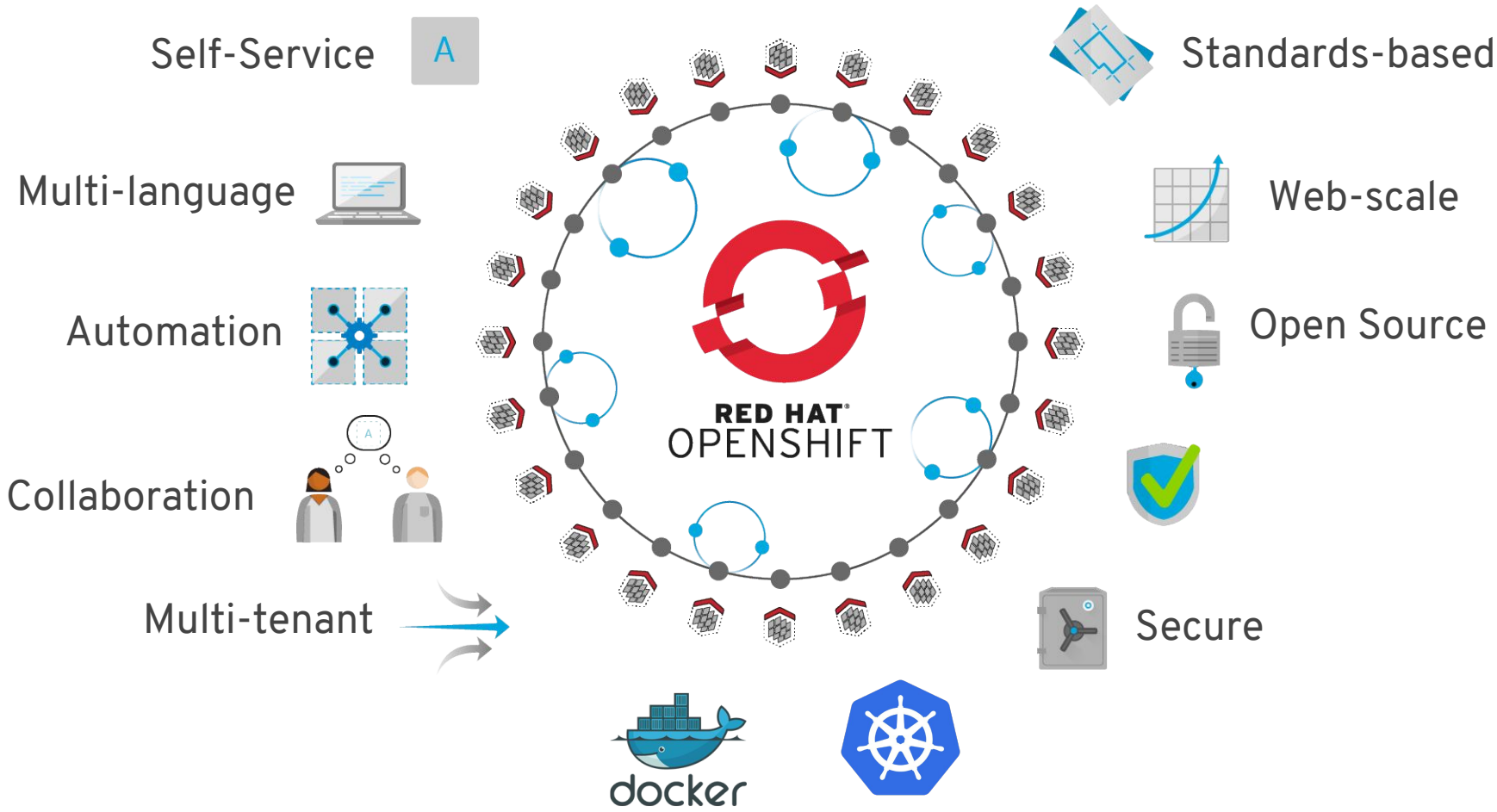

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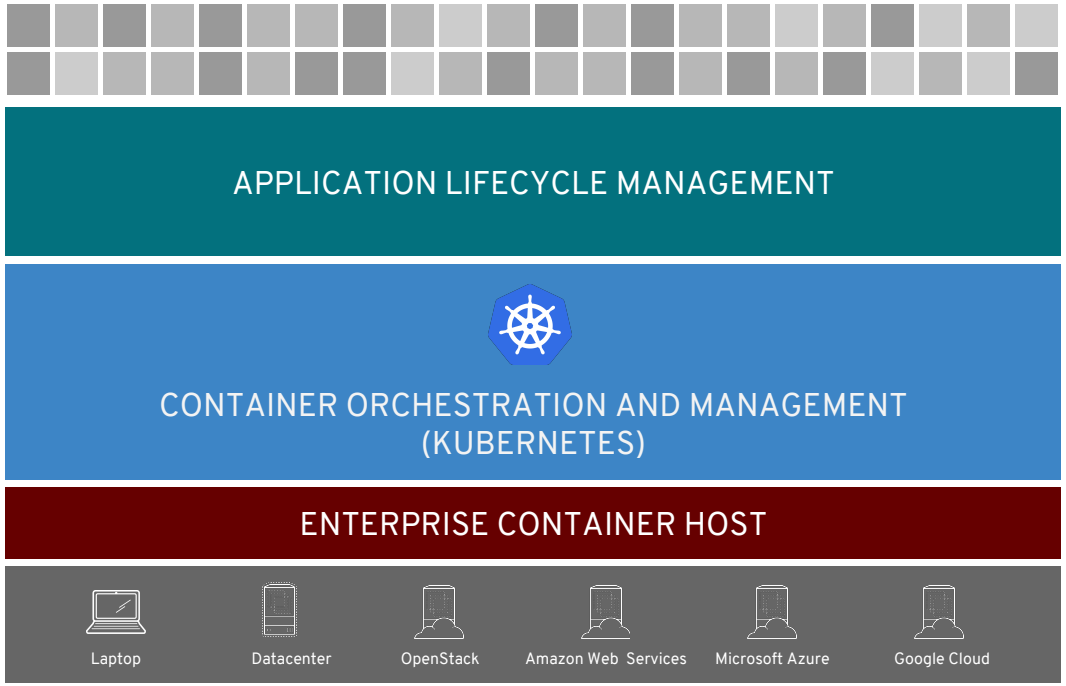


ANY
CONTAINER

RED HAT®
OPENSHIFT

ANY
INFRASTRUCTURE

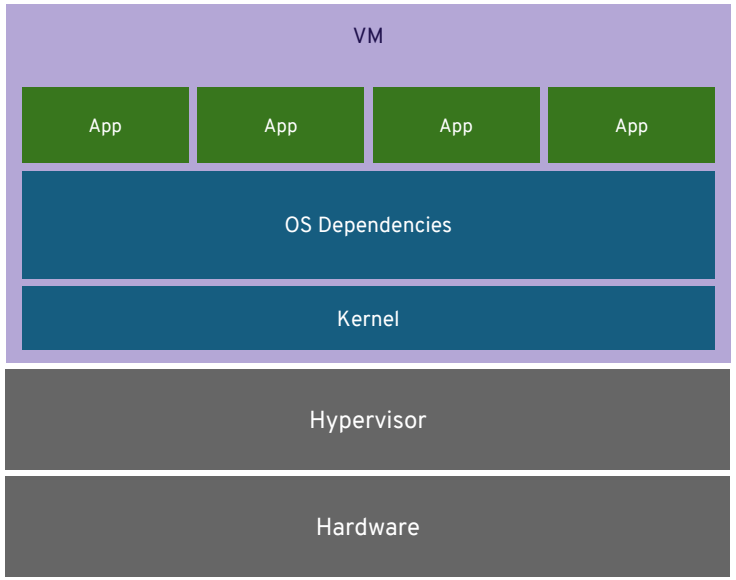
Cloud Native Applications

CRI-O is an implementation of the Kubernetes CRI (Container Runtime Interface) to enable using OCI (Open Container Initiative) compatible runtimes.

Optimized for Kubernetes	**Any OCI-compliant container from any OCI registry (including docker)**	**Improve Security and Performance at scale**

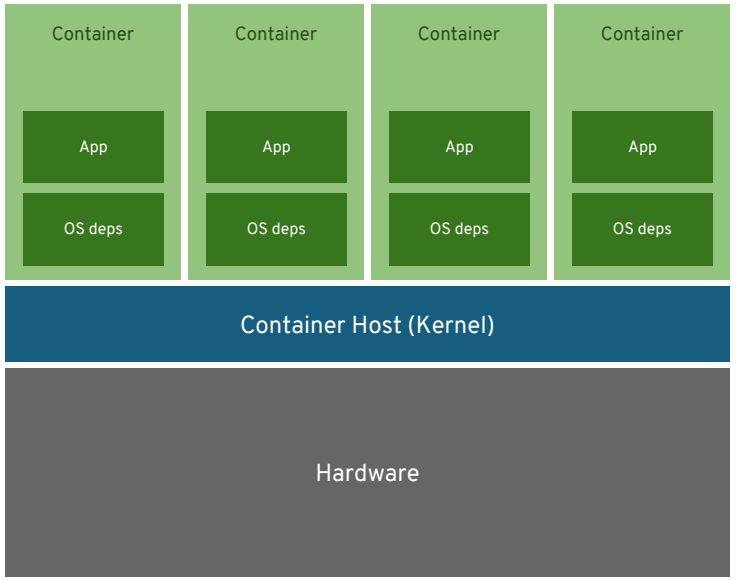
Cloud Native Applications

VIRTUAL MACHINES



VM virtualizes the hardware

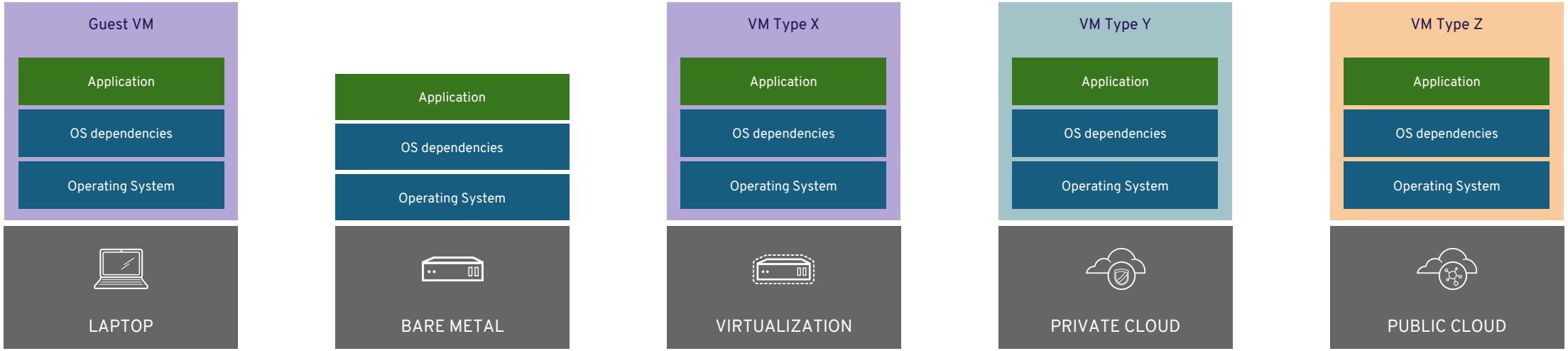
CONTAINERS



Container virtualizes the process

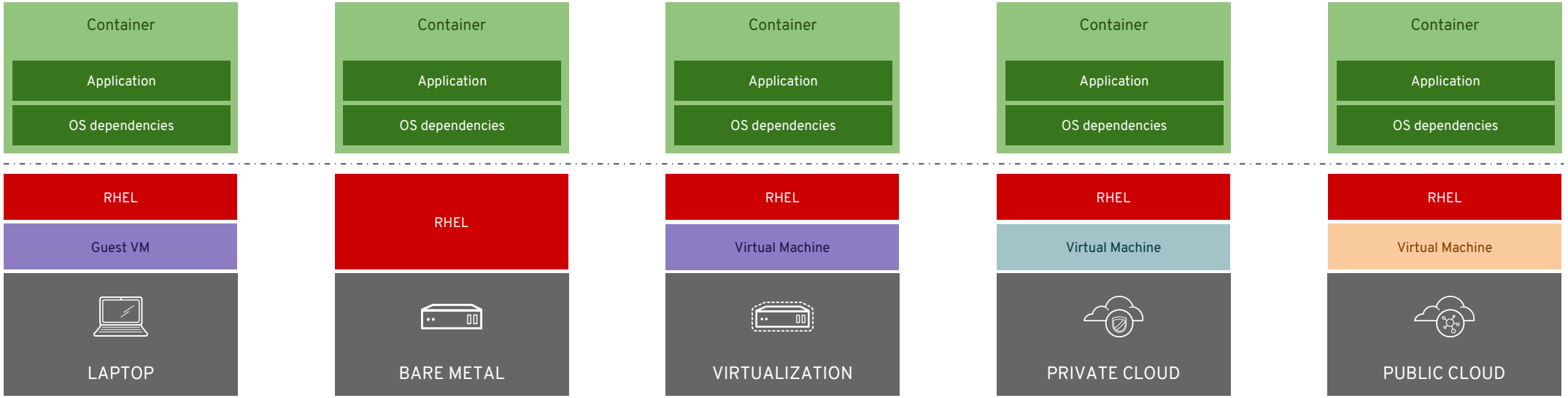
Cloud Native Applications

Virtual machines are NOT portable across hypervisor and do NOT provide portable packaging for applications

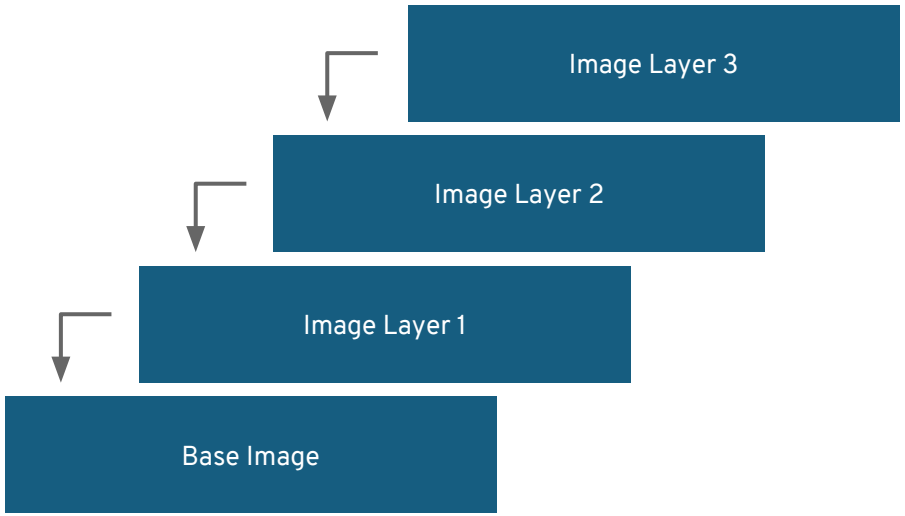


Cloud Native Applications

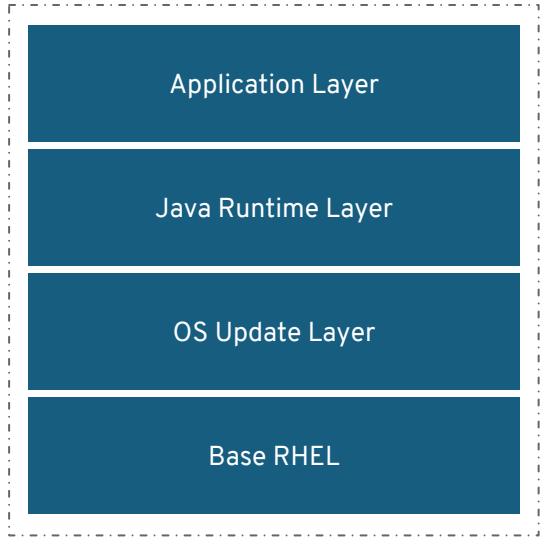
RHEL Containers + RHEL Host = Guaranteed Portability
Across Any Infrastructure



Cloud Native Applications



Container Image Layers



Example Container Image

Cloud Native Applications

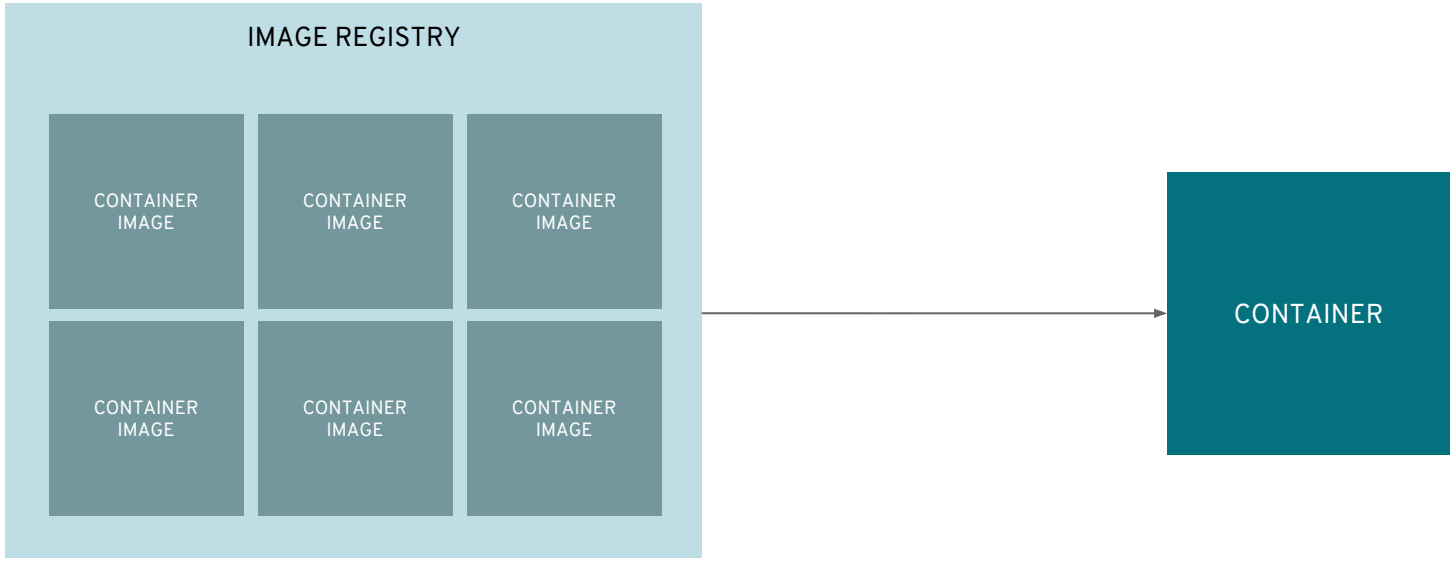
A container is the smallest compute unit

Cloud Native Applications

Containers are created from container images

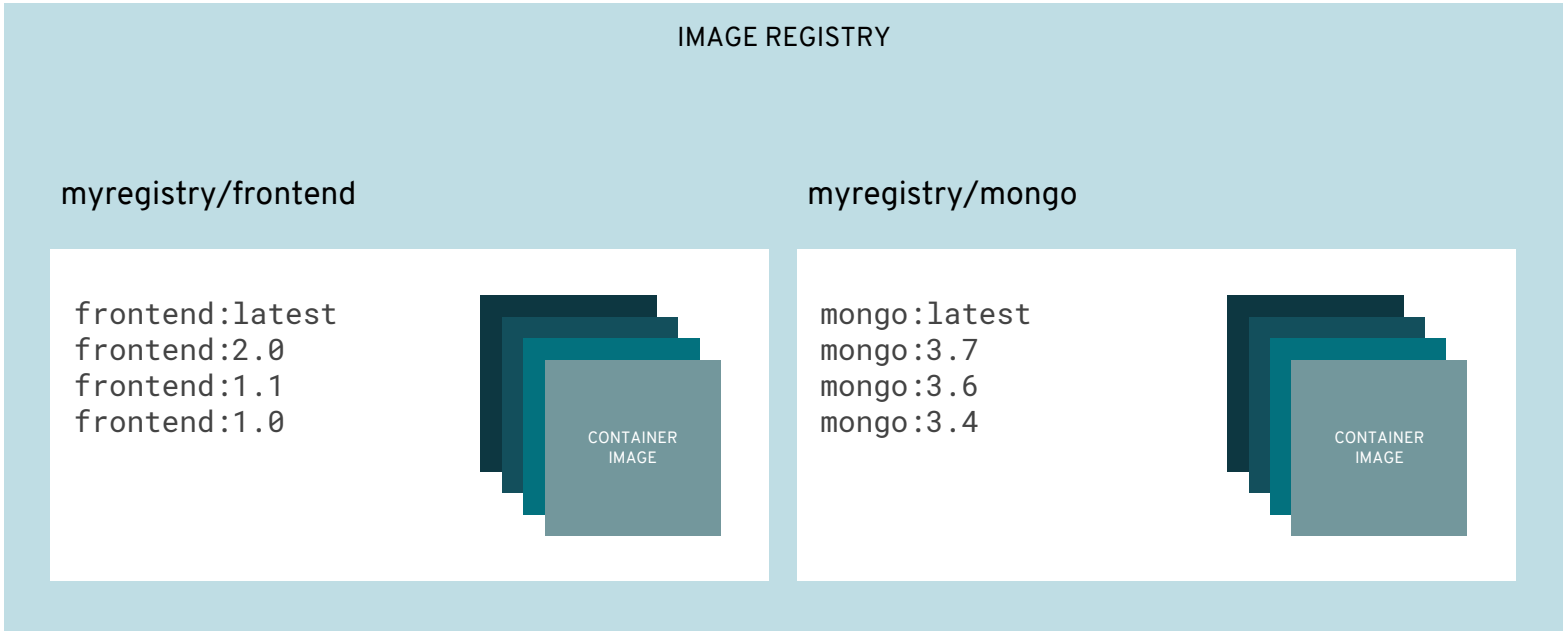
Cloud Native Applications

Container images are stored in an image registry



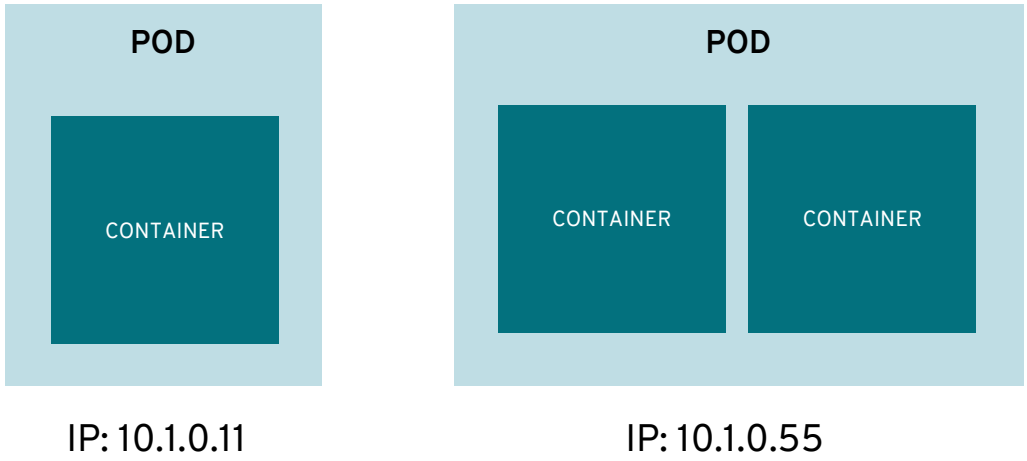
Cloud Native Applications

An image repository contains all versions of an image in the image registry



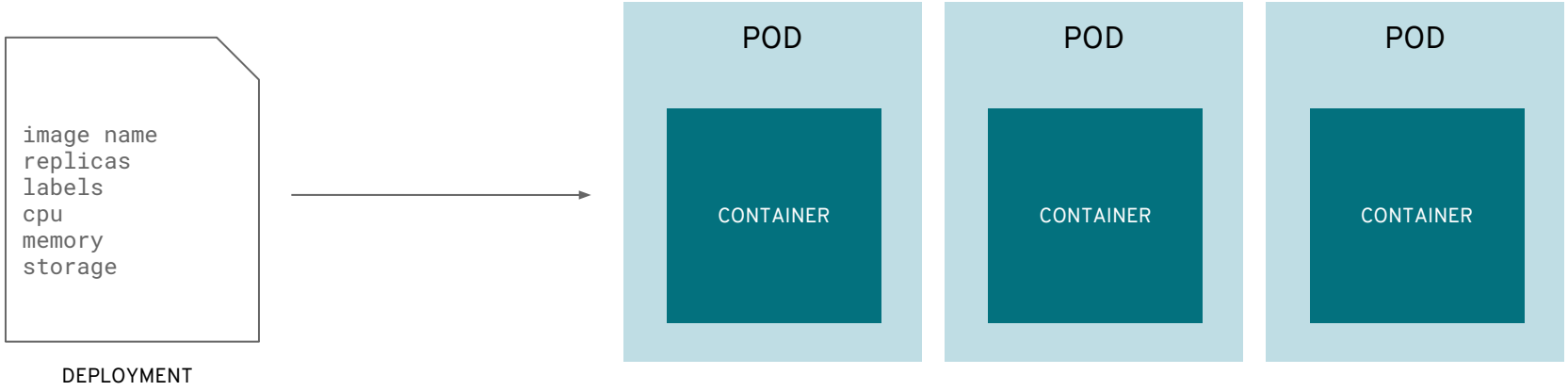
Cloud Native Applications

Containers are wrapped in pods which are units of deployment and management



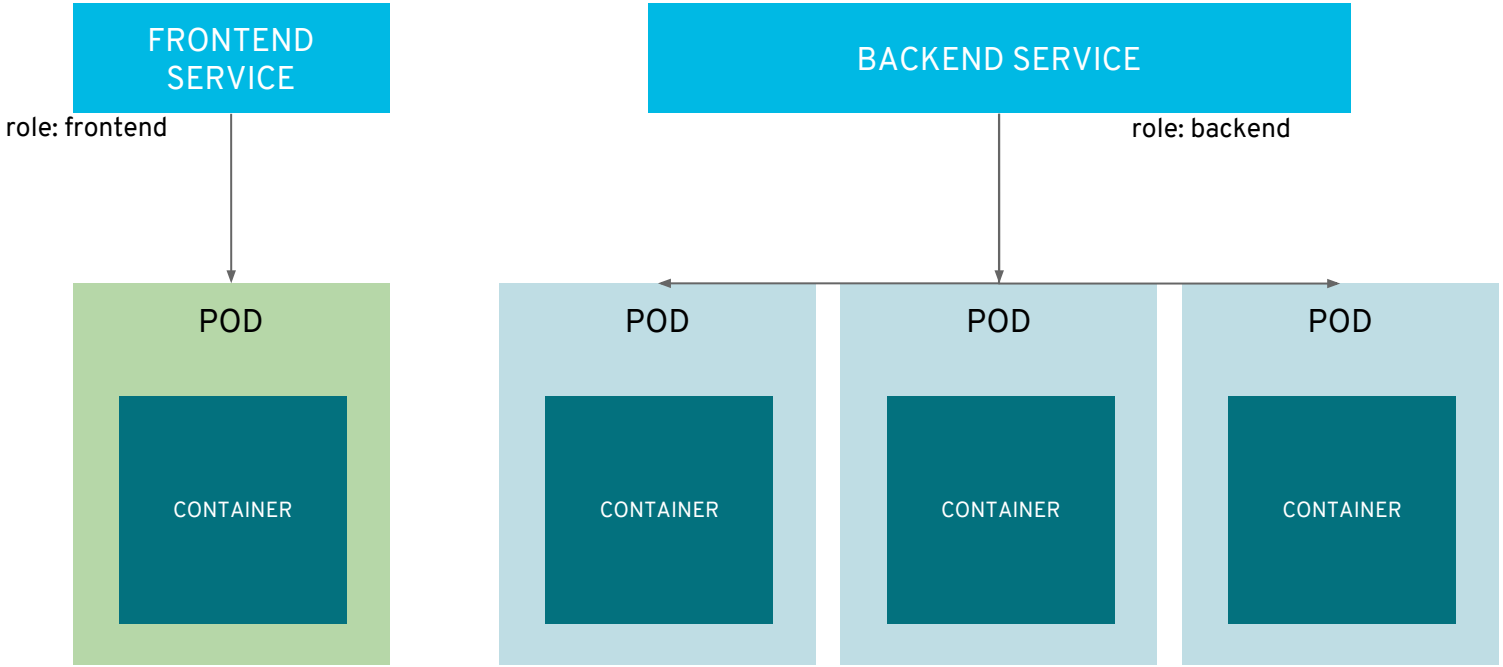
Cloud Native Applications

Pods configuration is defined in a `deployment`



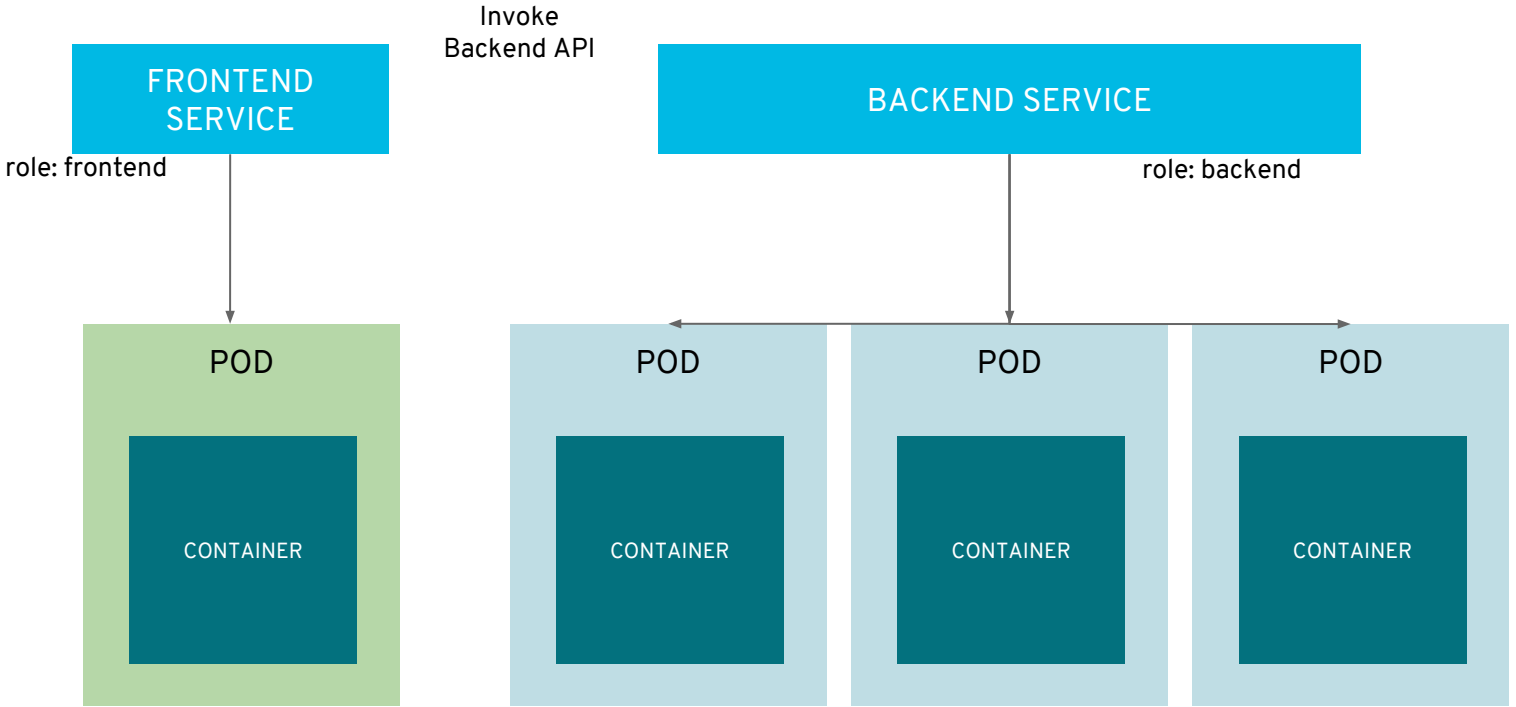
Cloud Native Applications

Services provide internal load-balancing and service discovery across pods



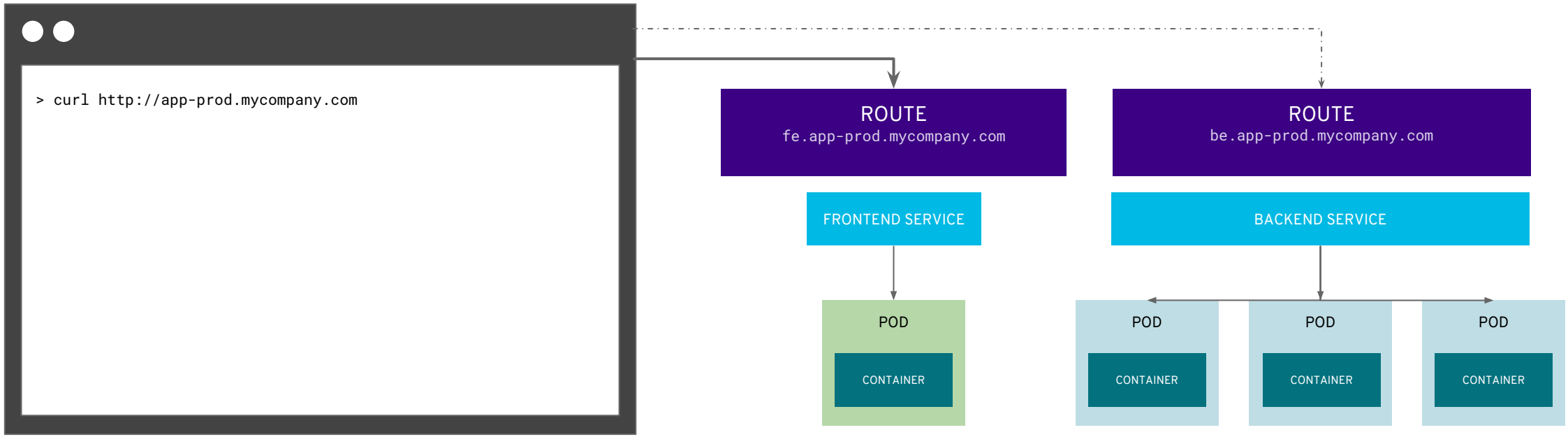
Cloud Native Applications

Apps can talk to each other via services



Cloud Native Applications

Routes add services to the external load-balancer and provide readable urls for the app

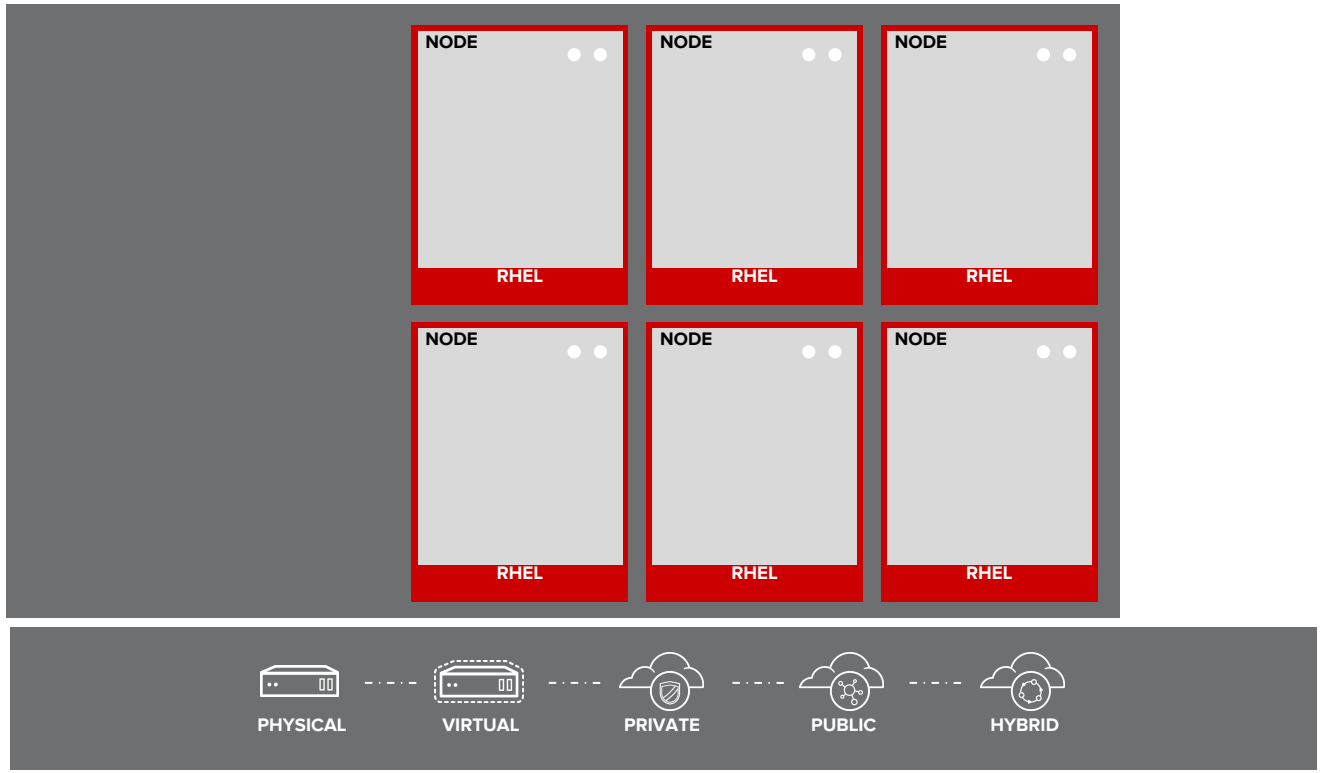


Cloud Native Applications

OpenShift Architecture

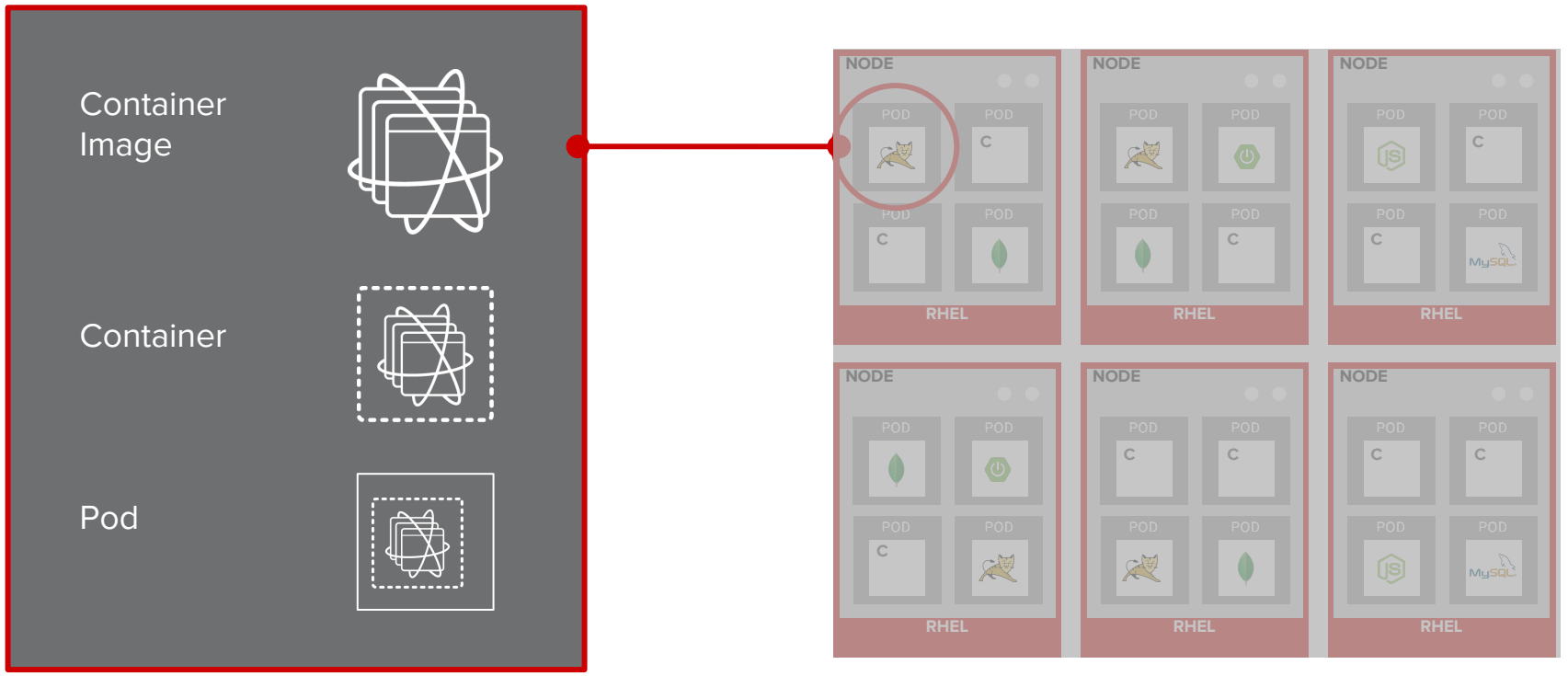
Cloud Native Applications

Cloud Native Applications

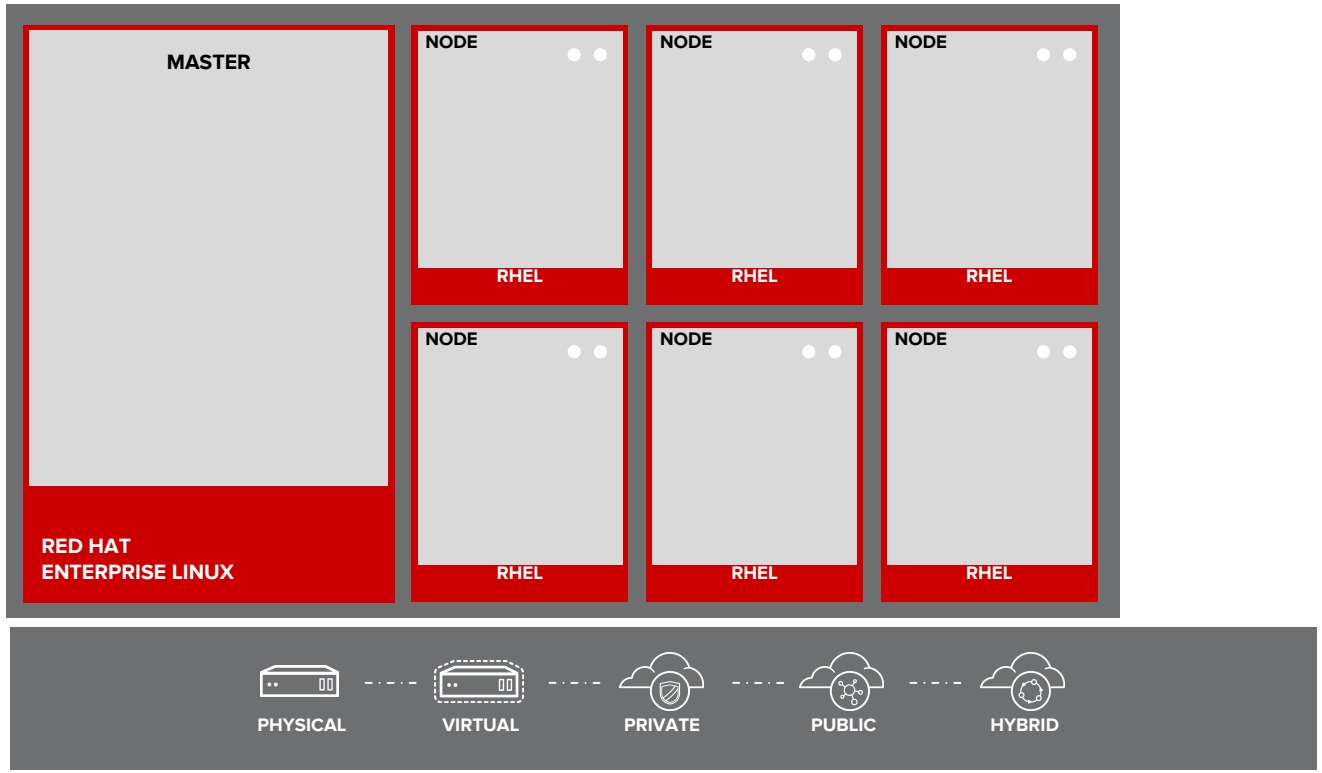


Cloud Native Applications

Cloud Native Applications



Cloud Native Applications



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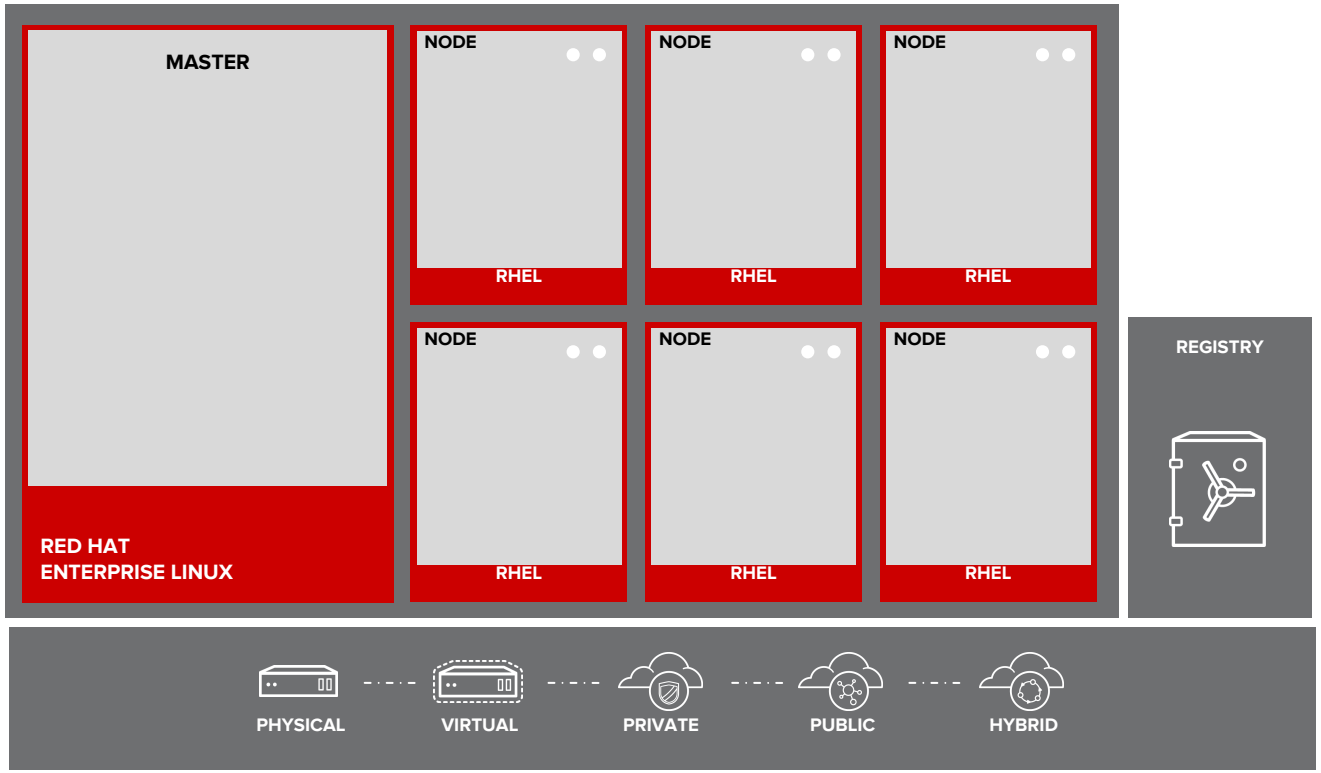

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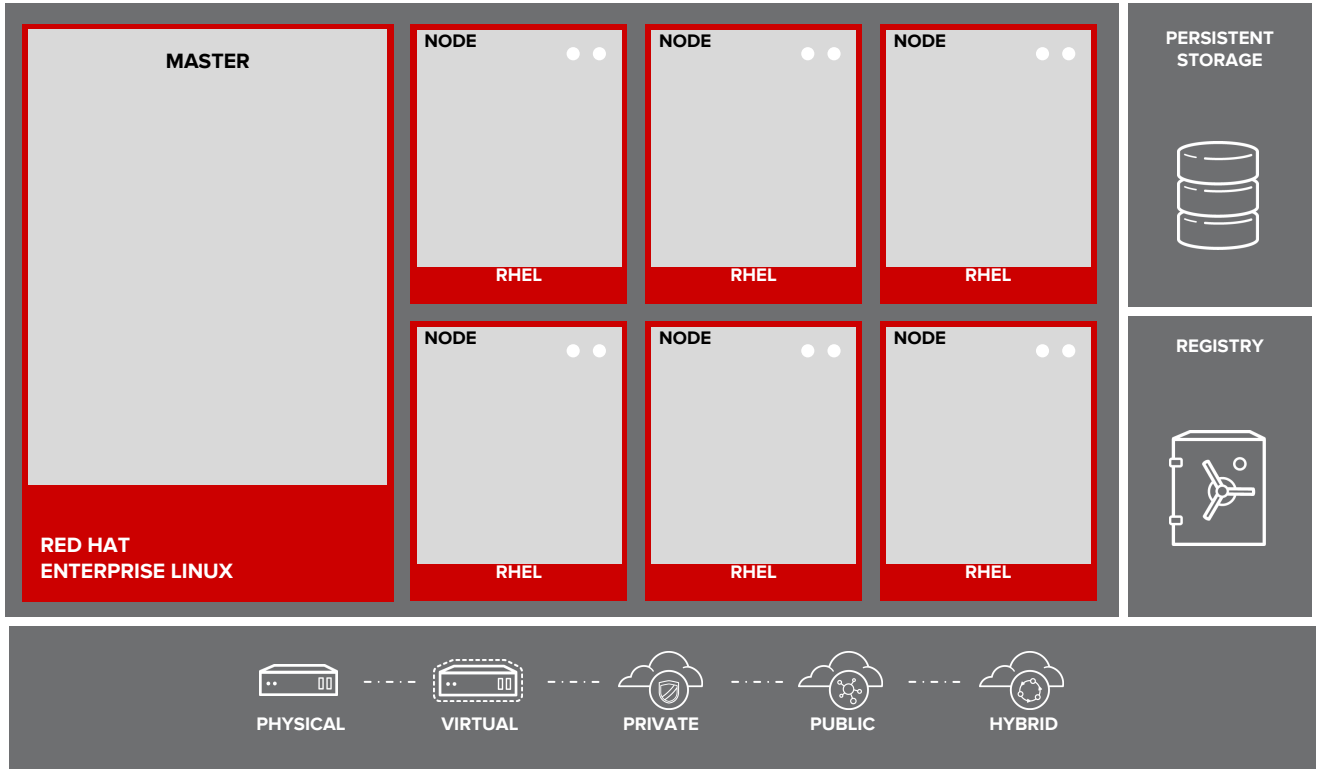

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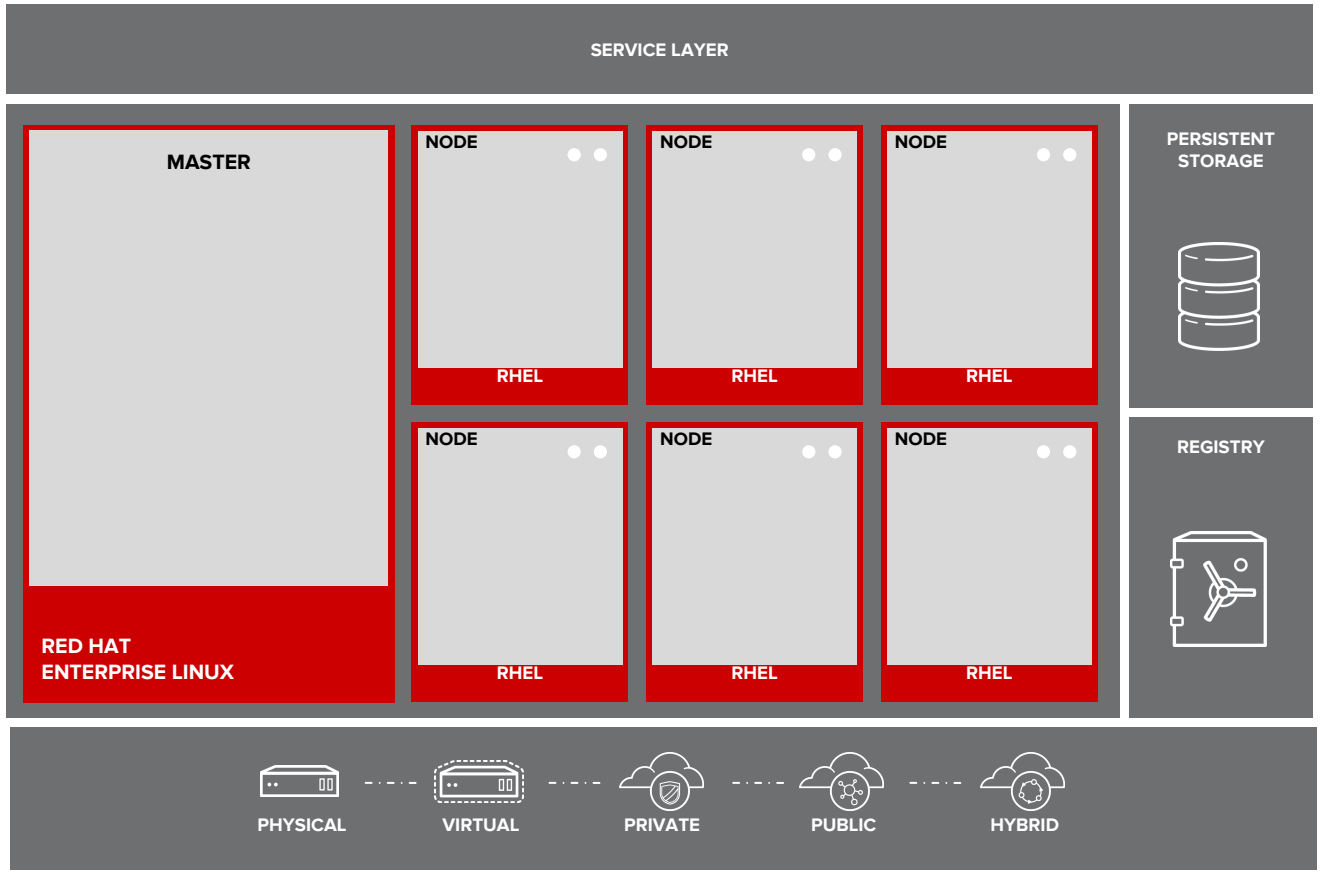

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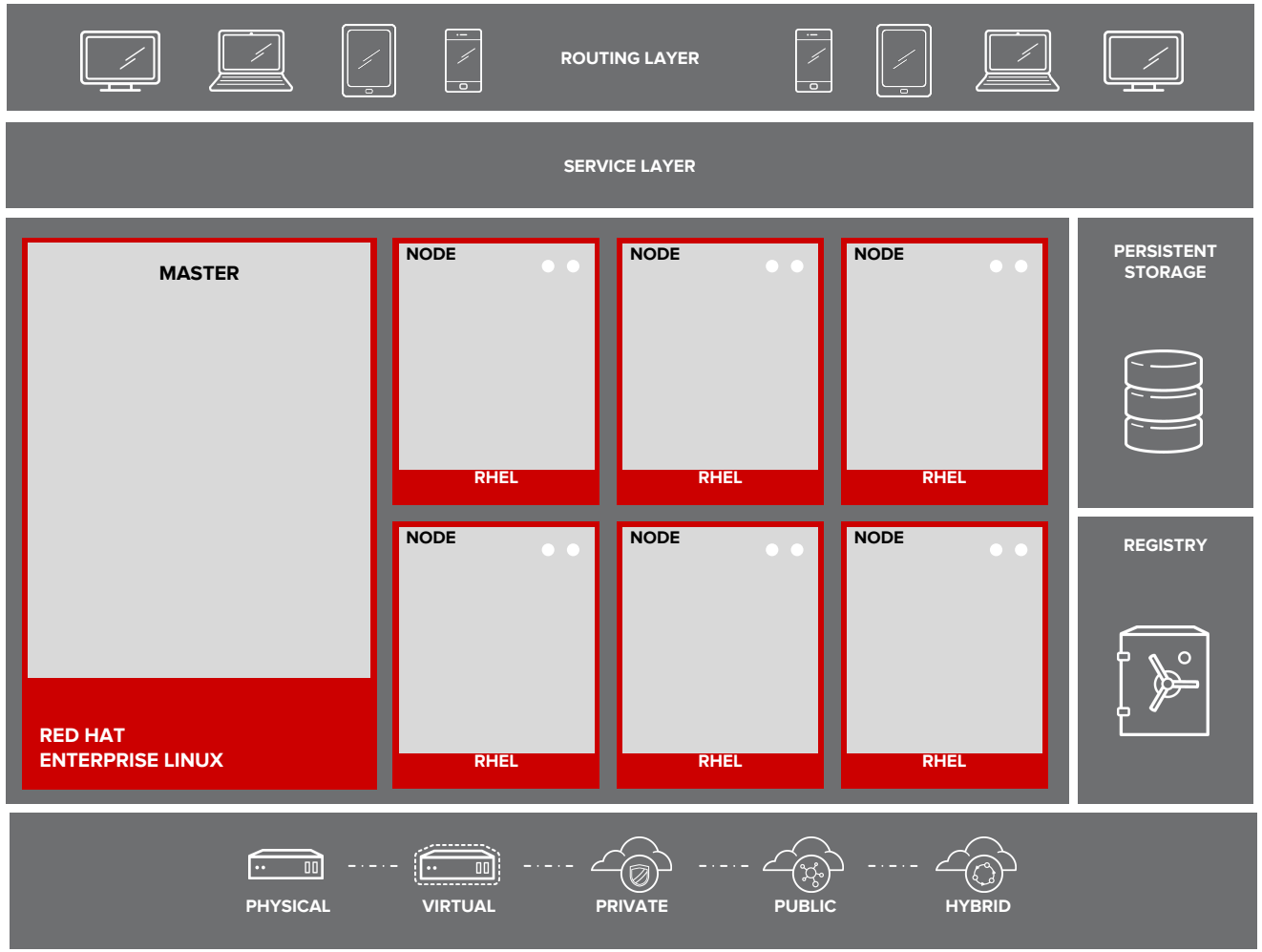

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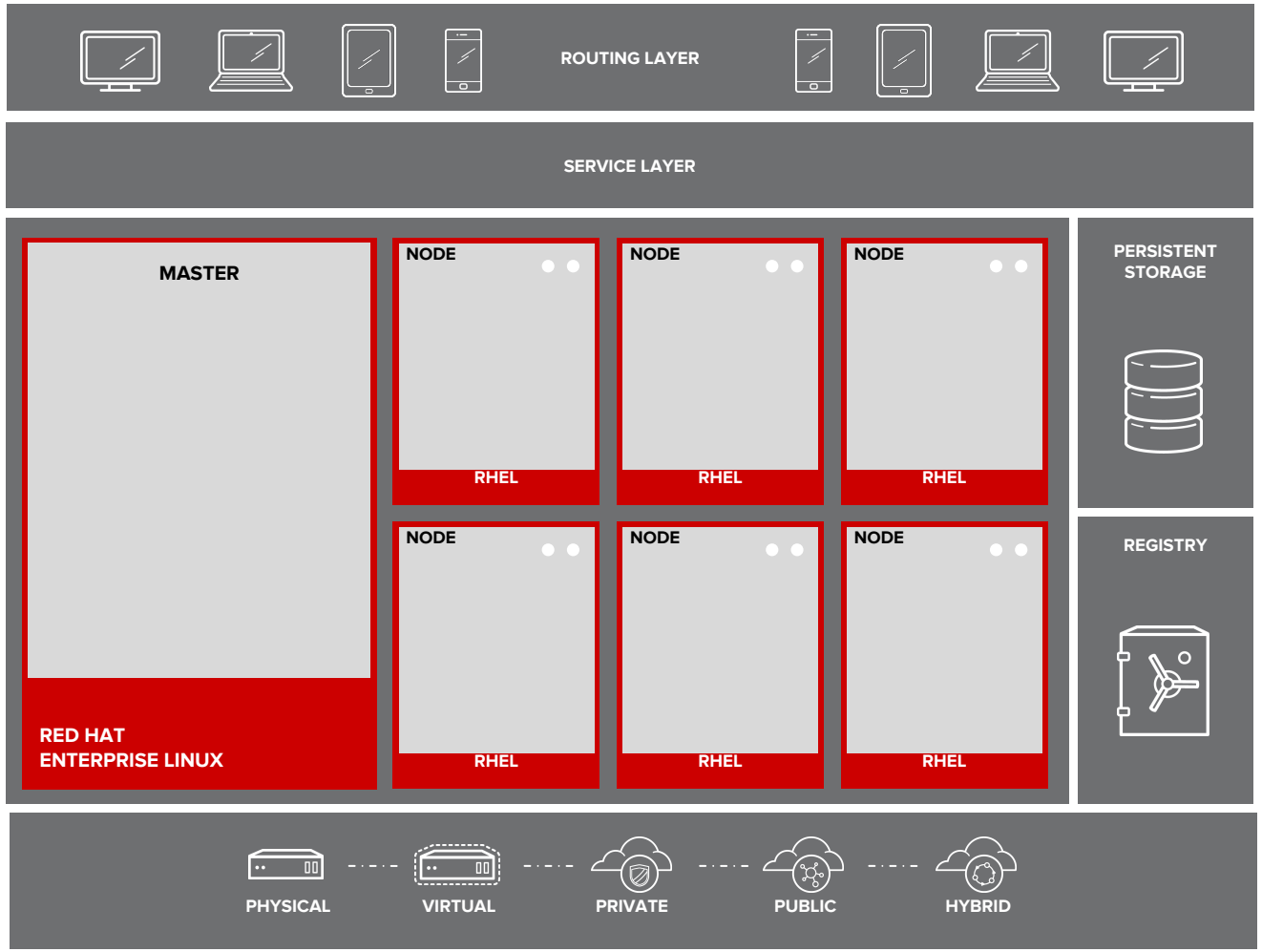

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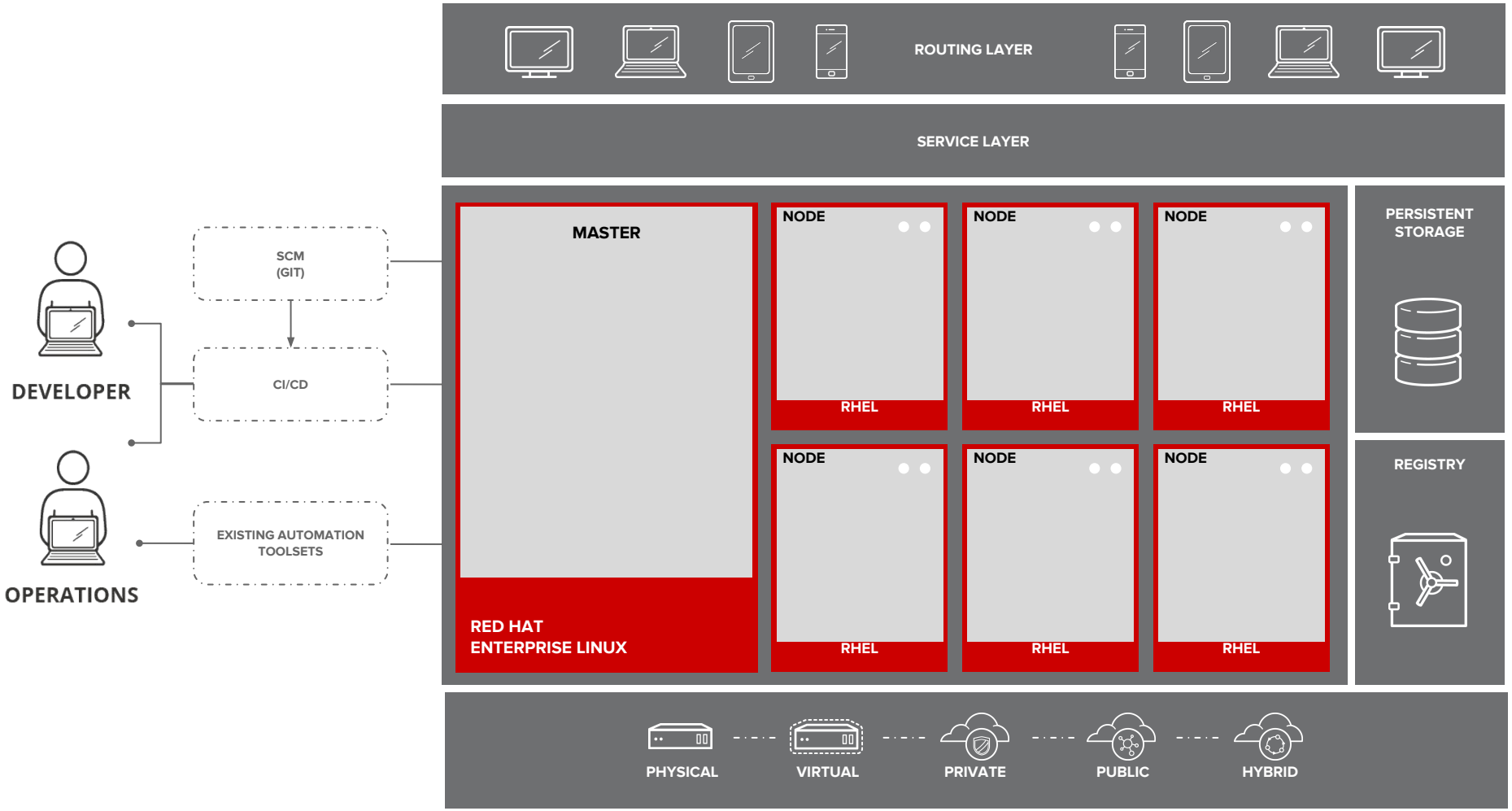

Cloud Native Applications

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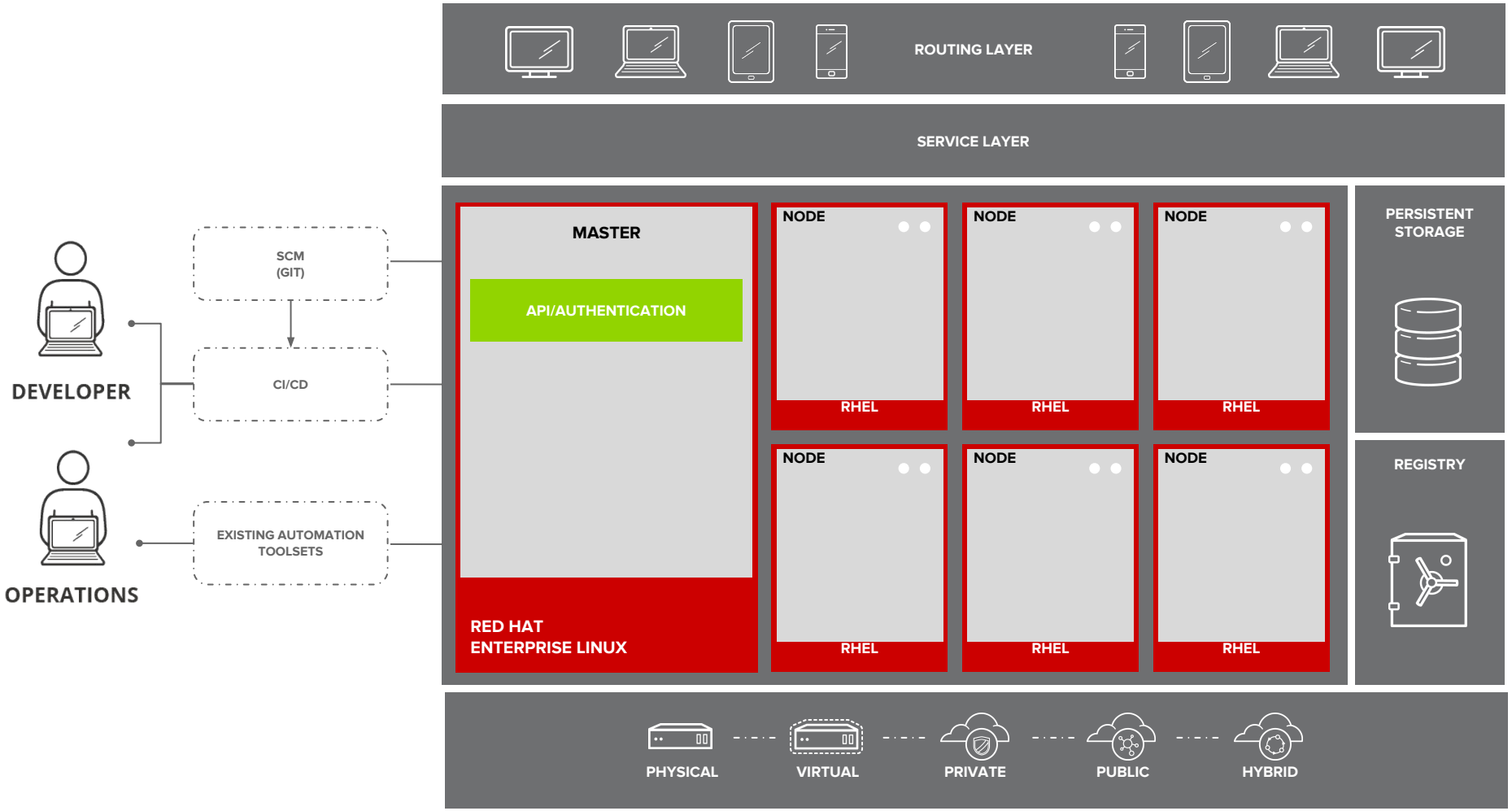

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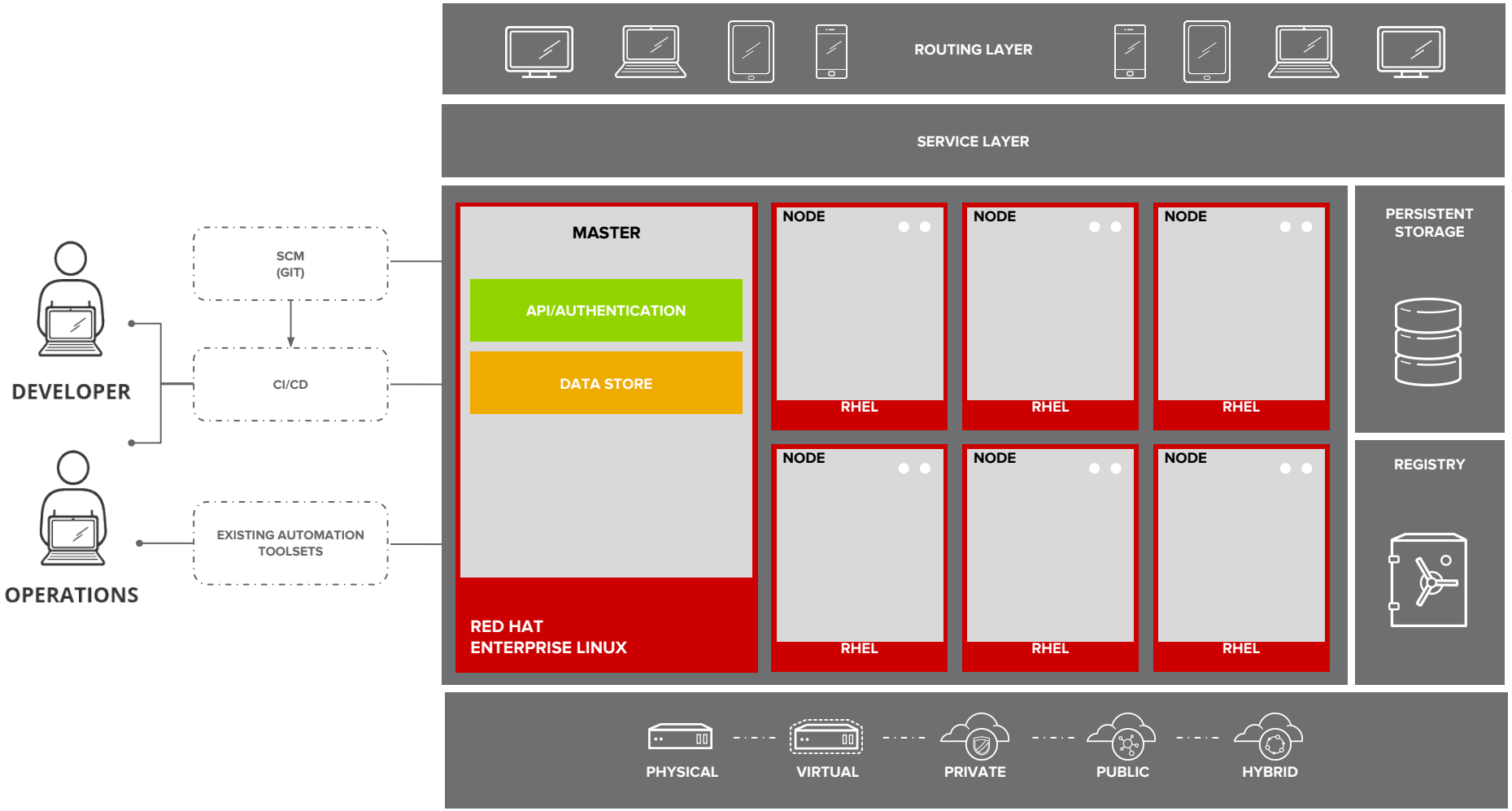

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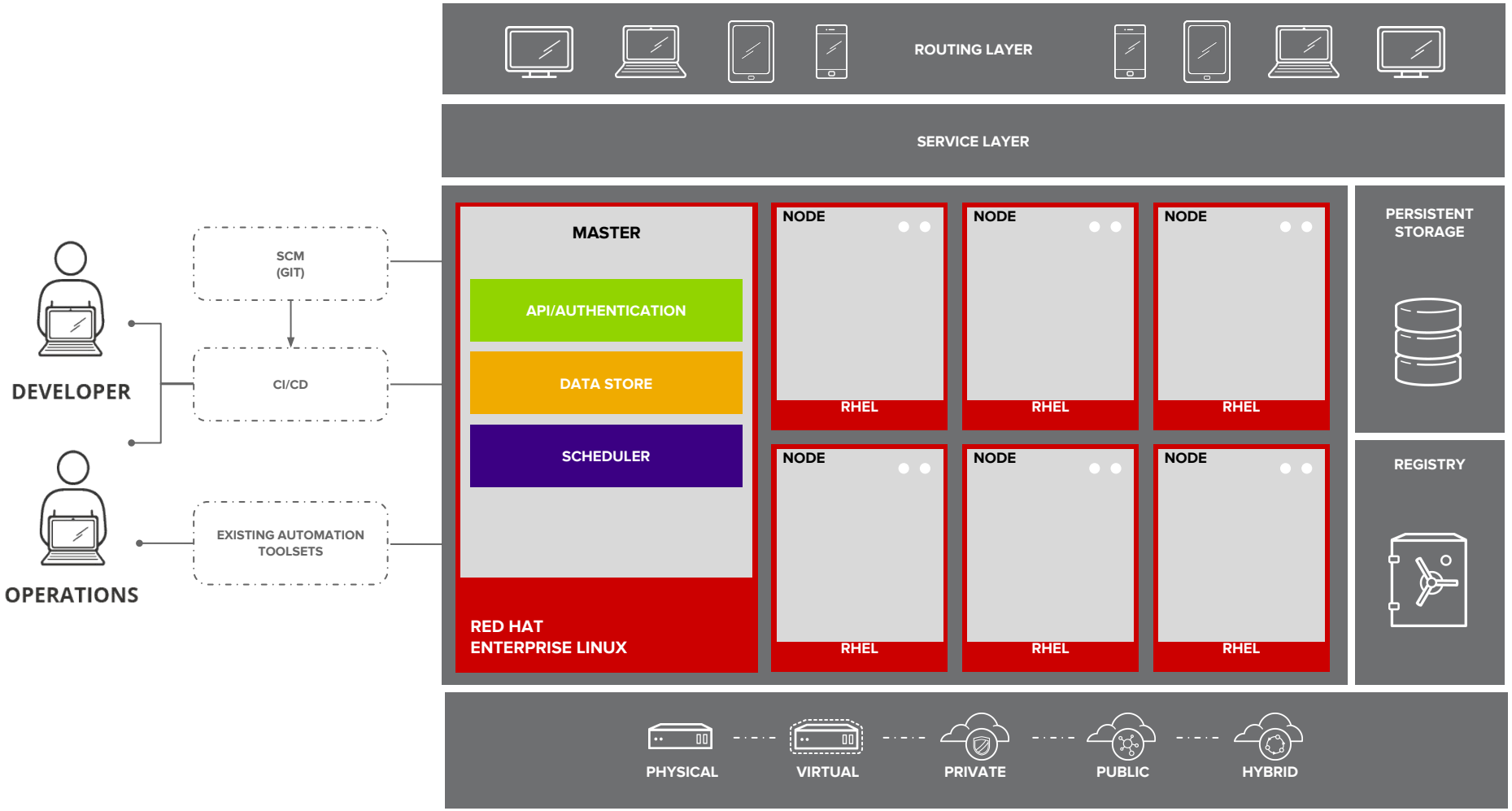

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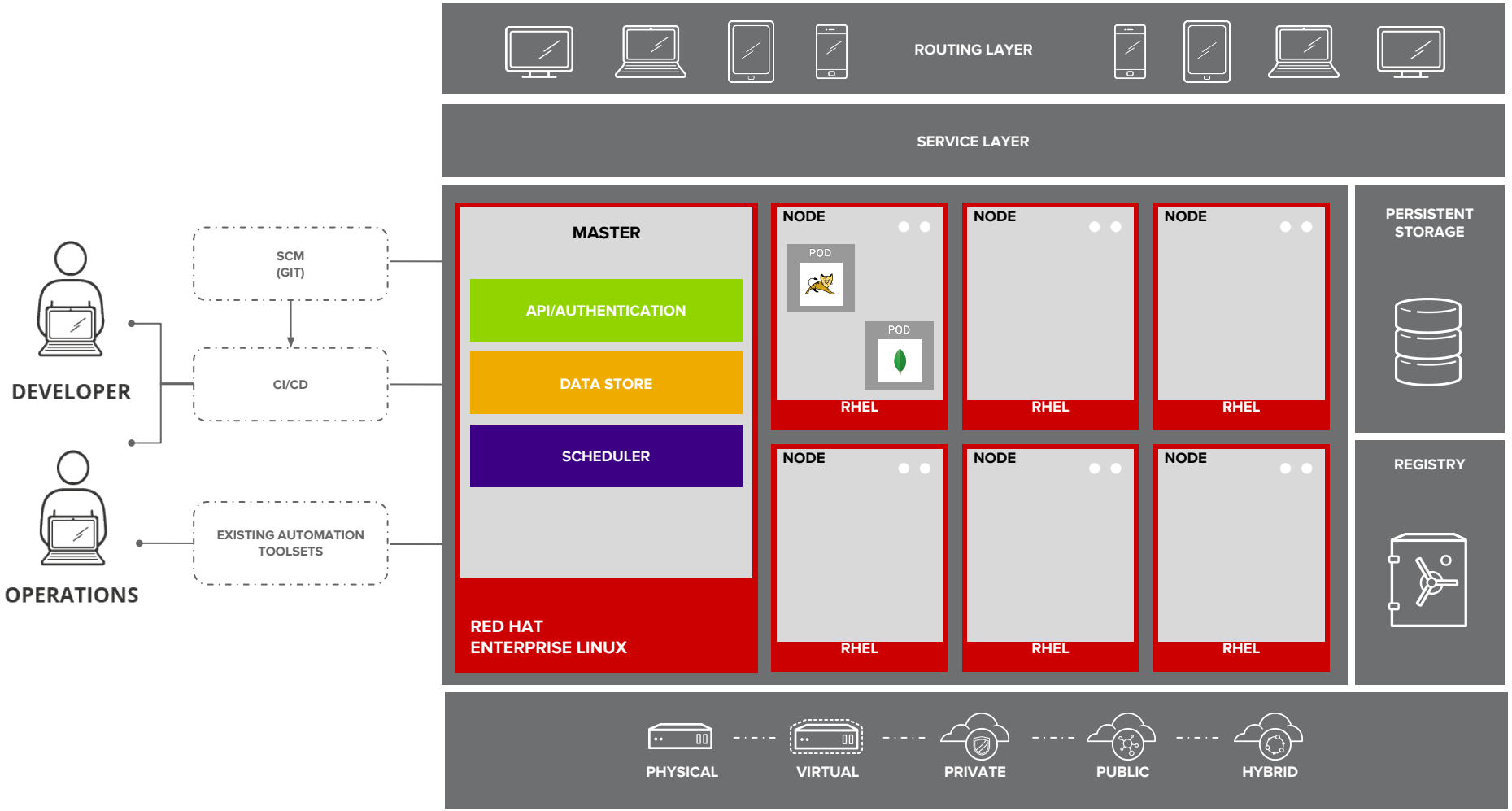

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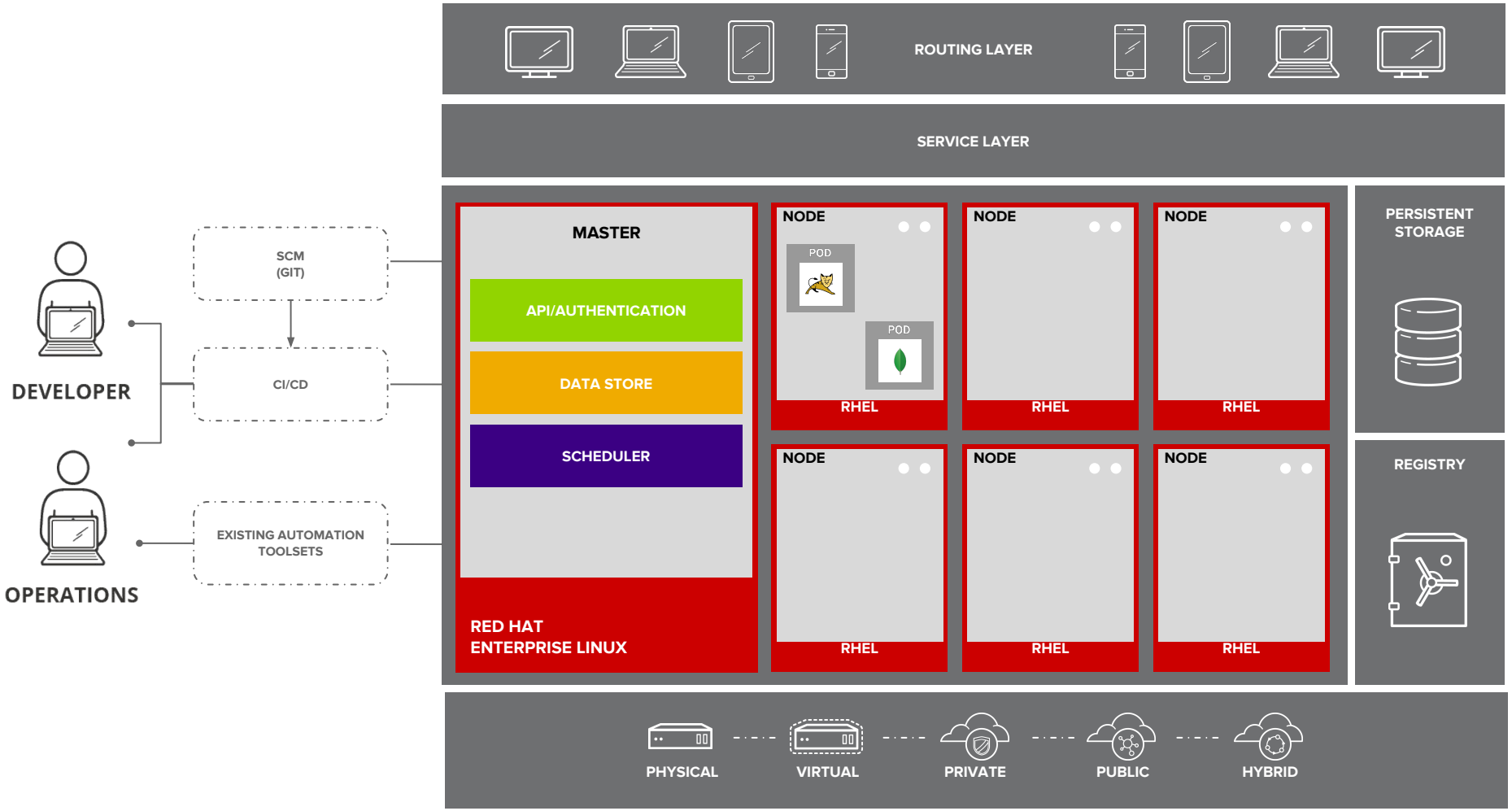

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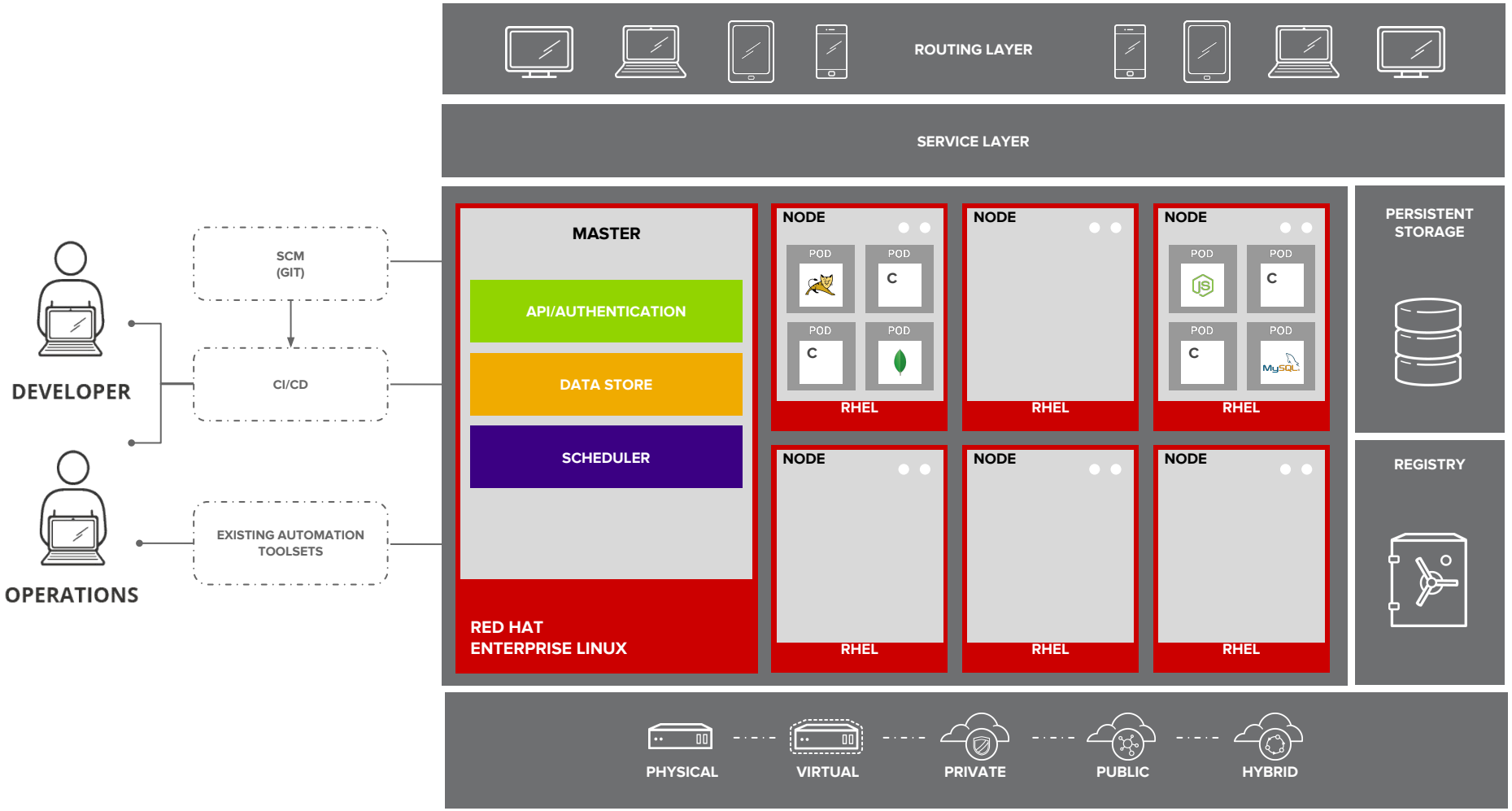

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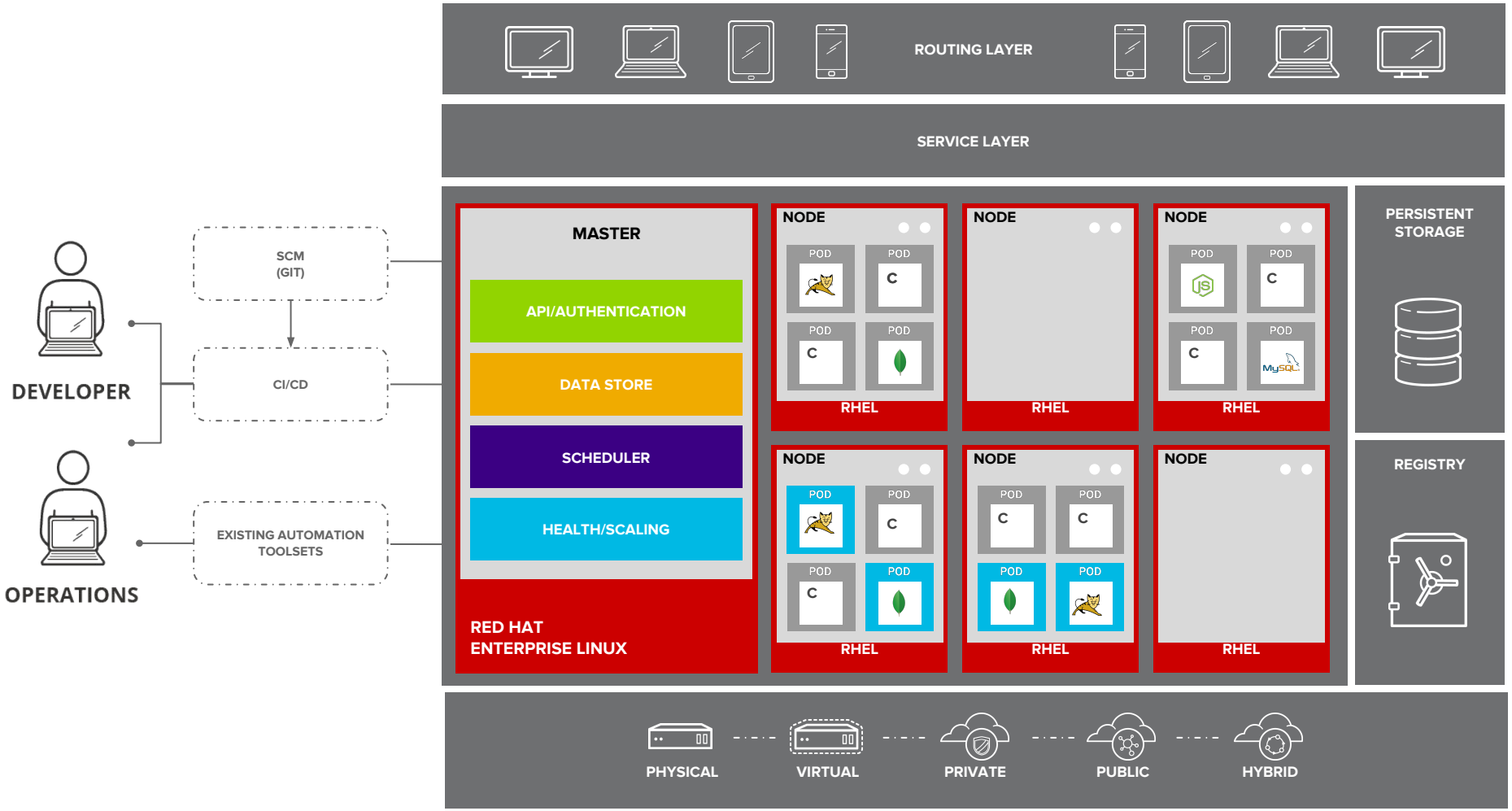

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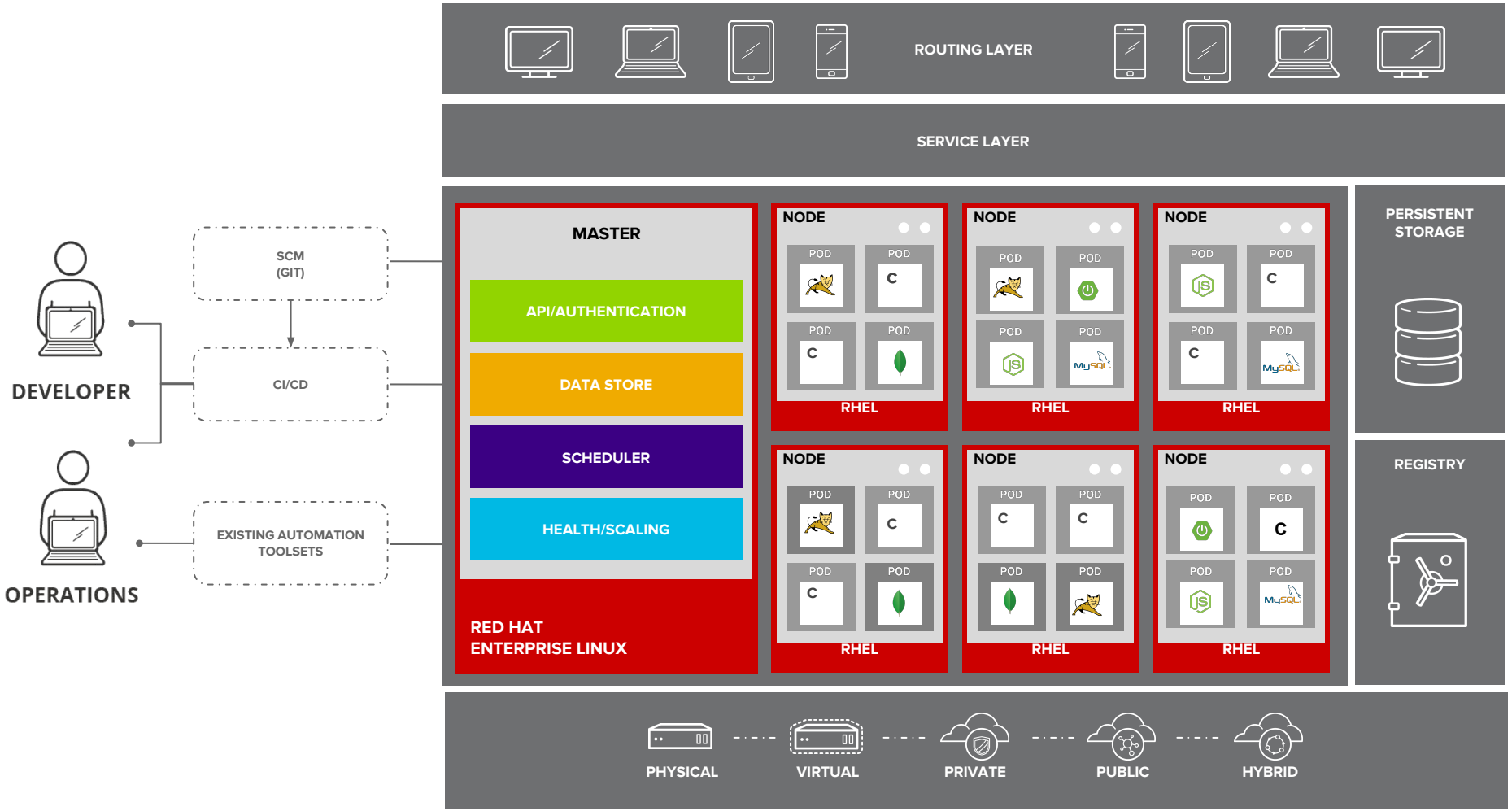

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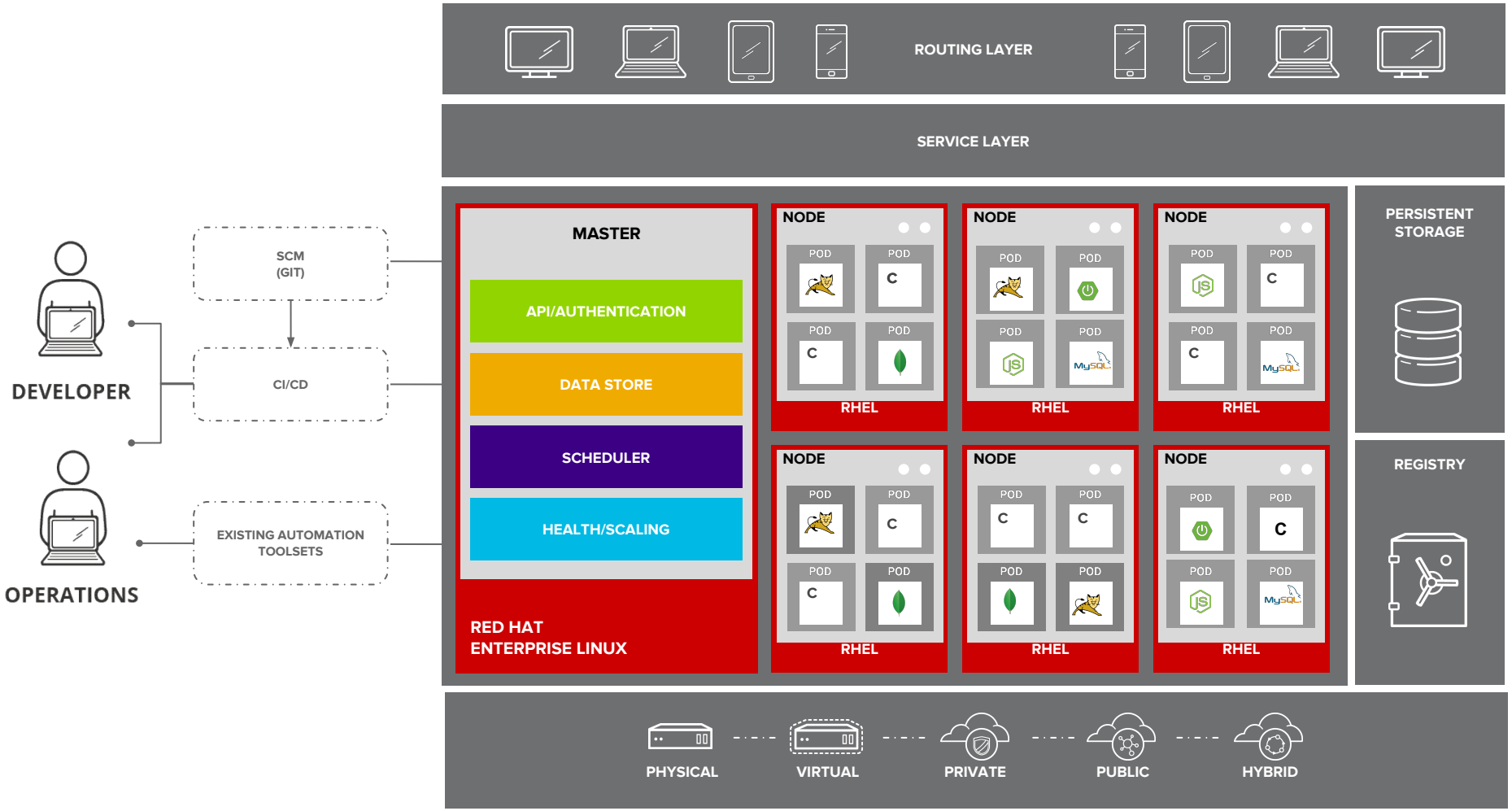

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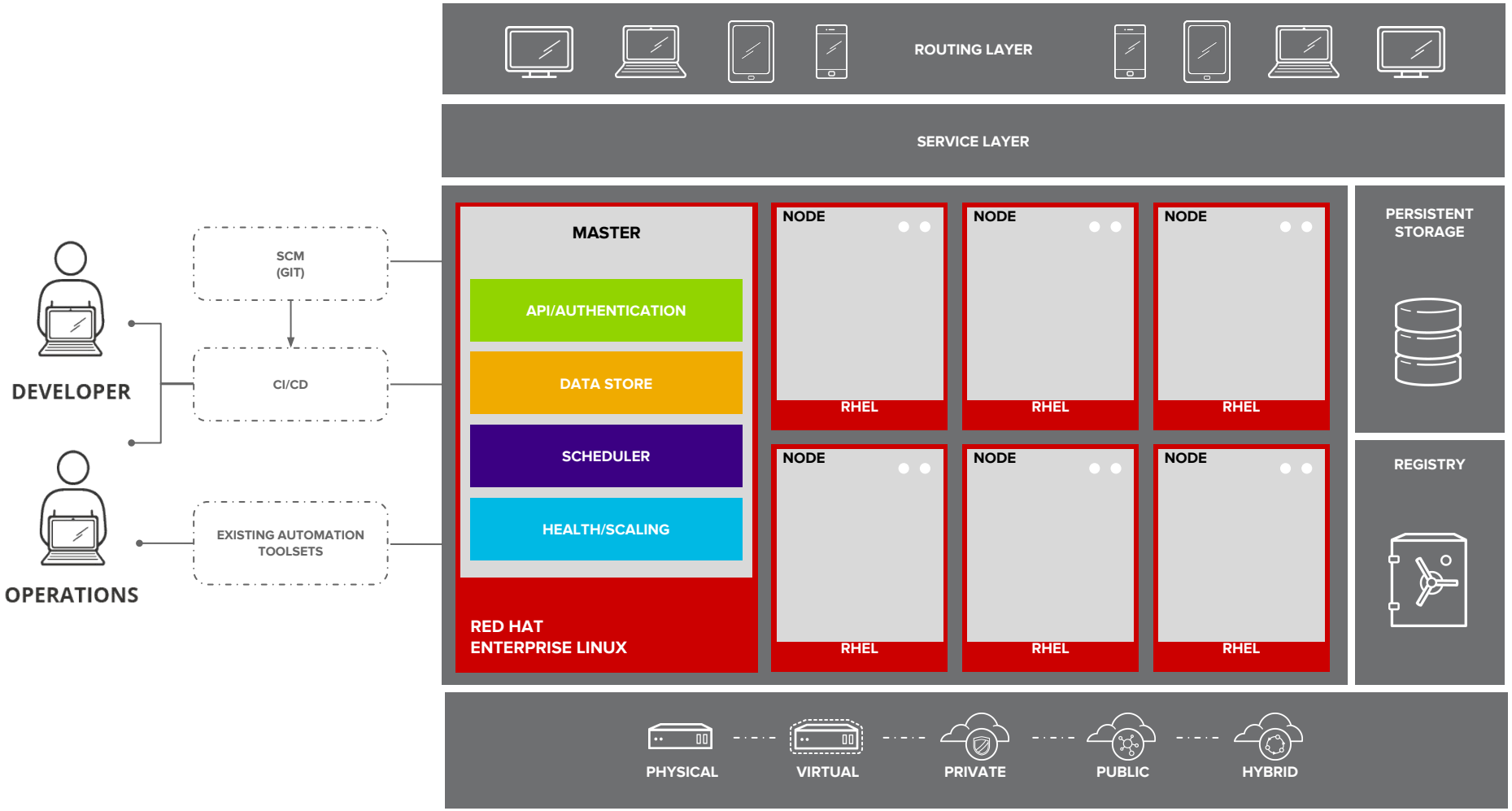

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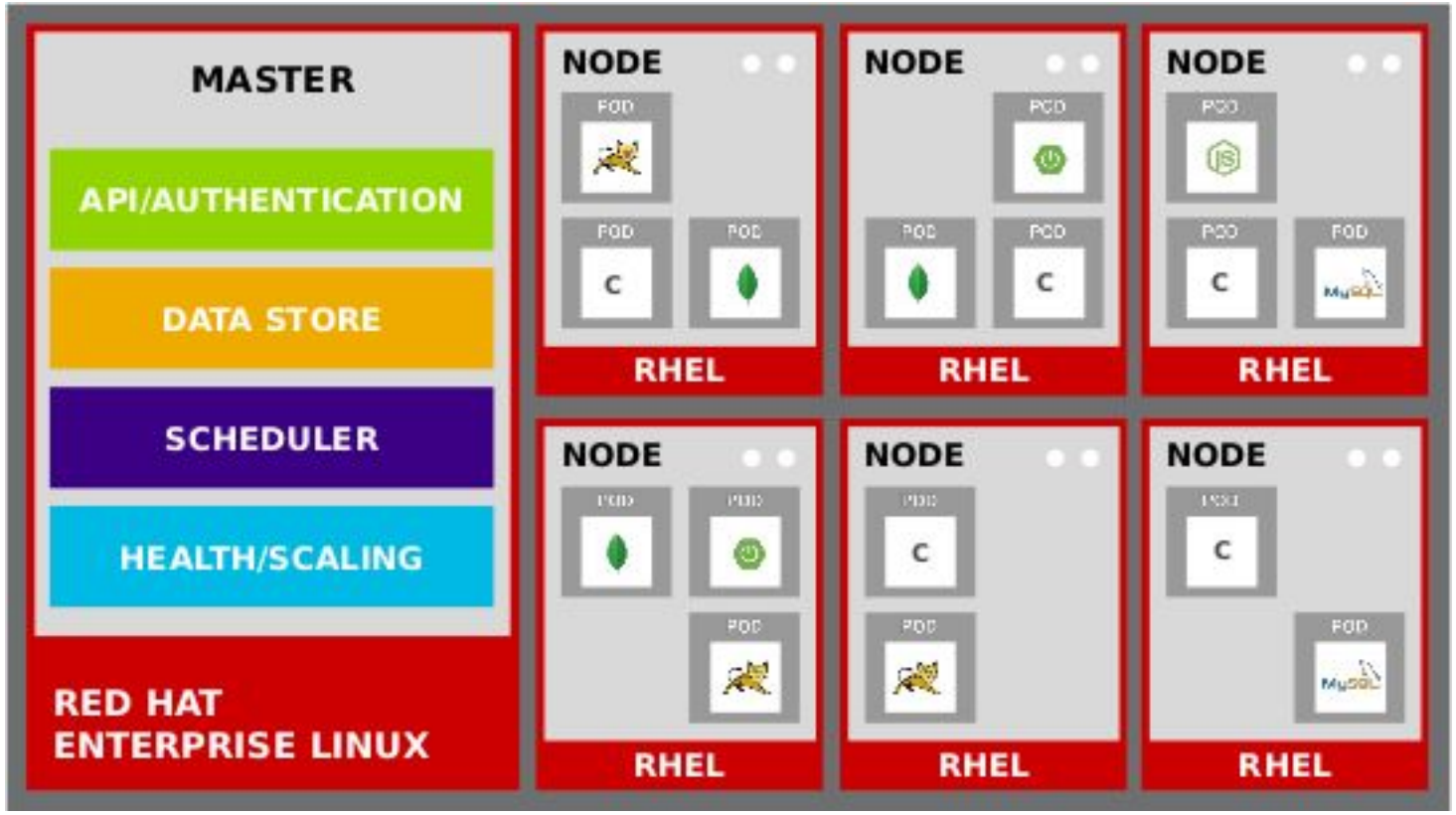

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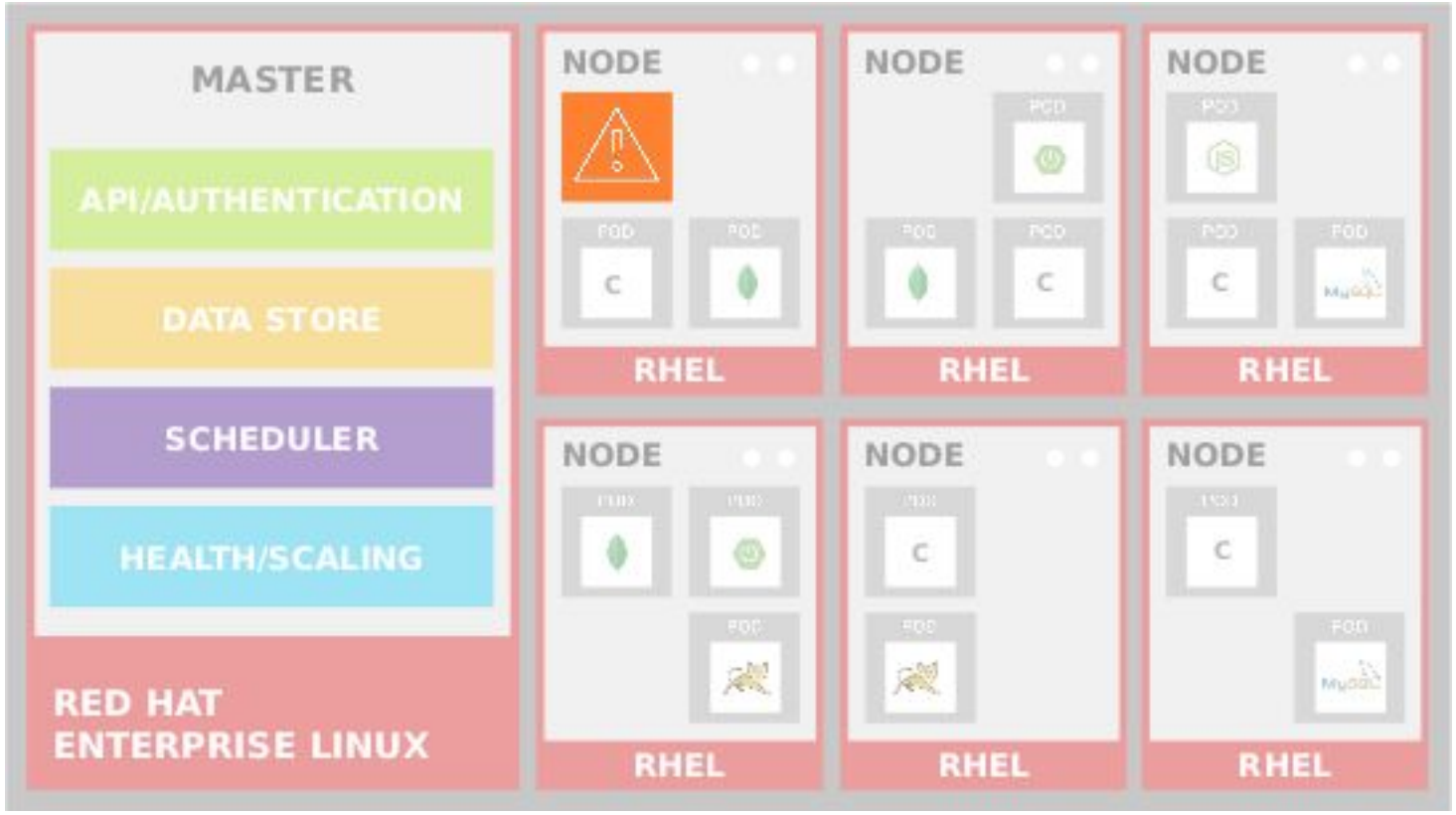

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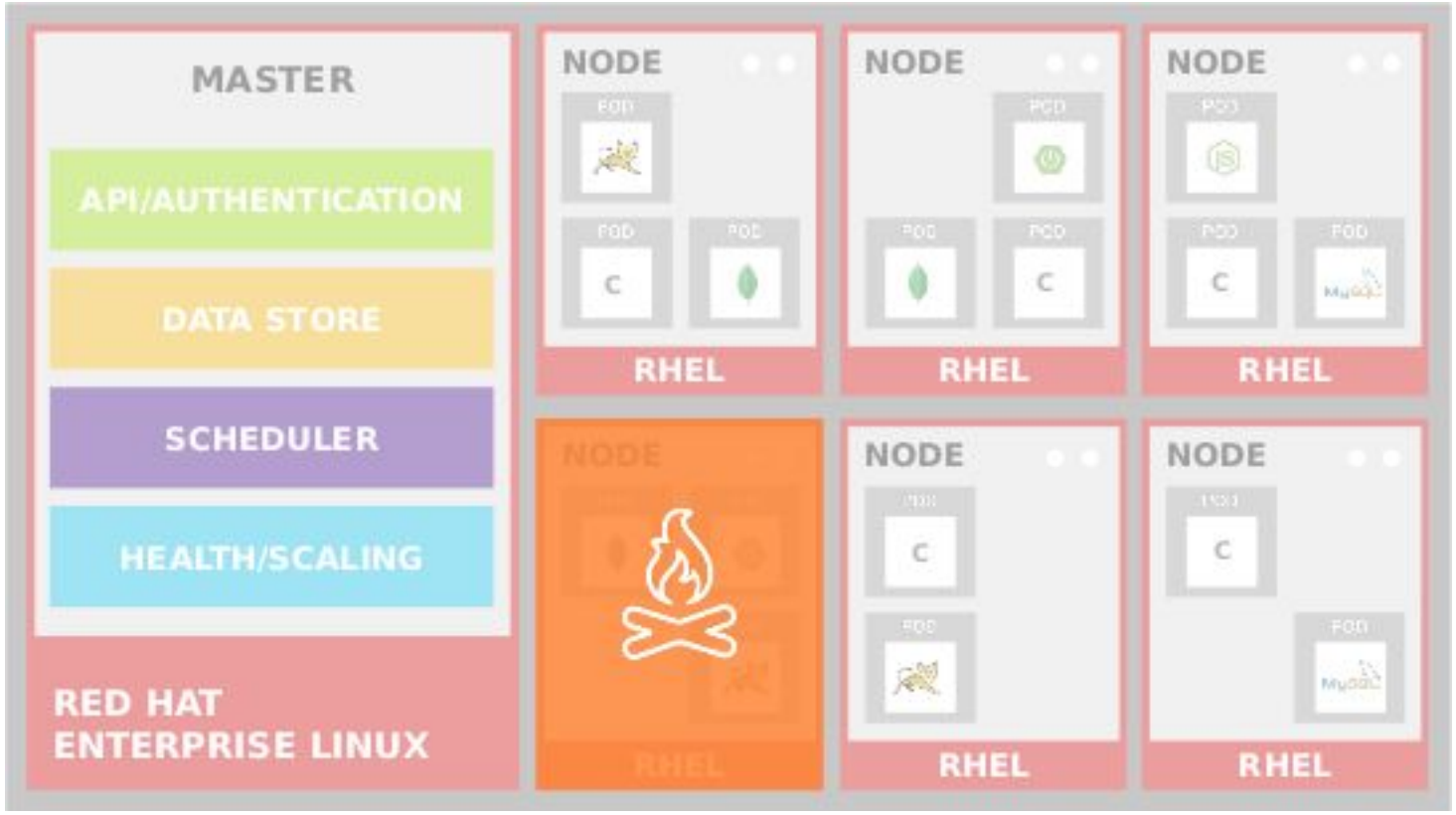

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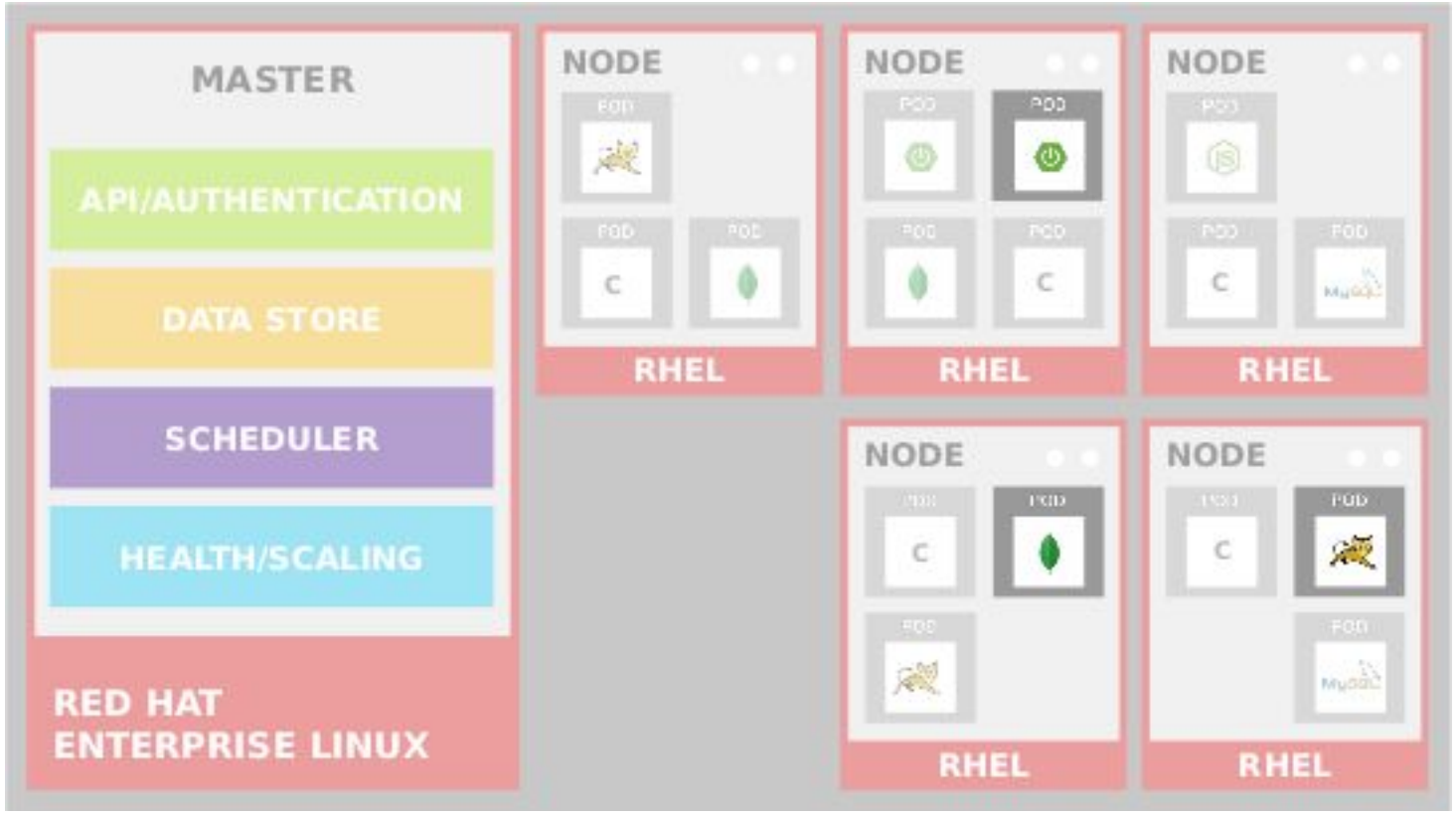
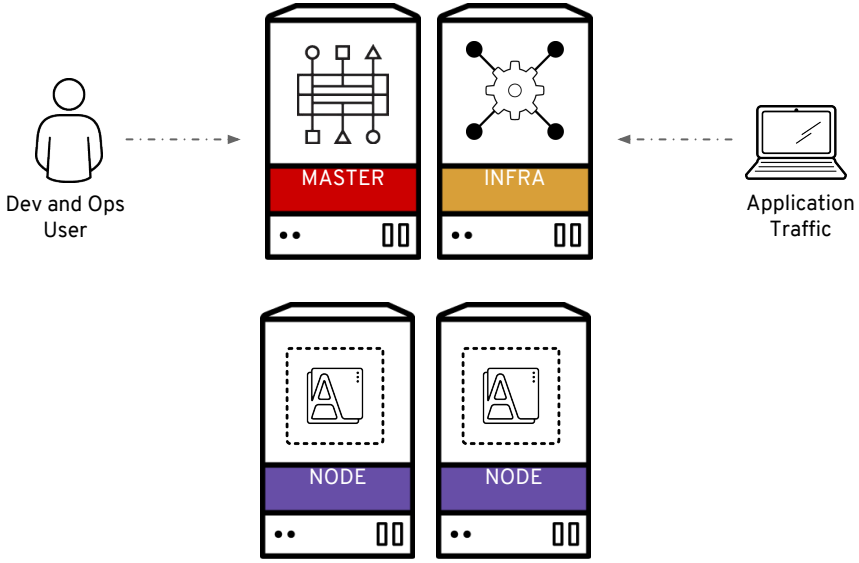


Cloud Native Applications

OpenShift Installation Architecture

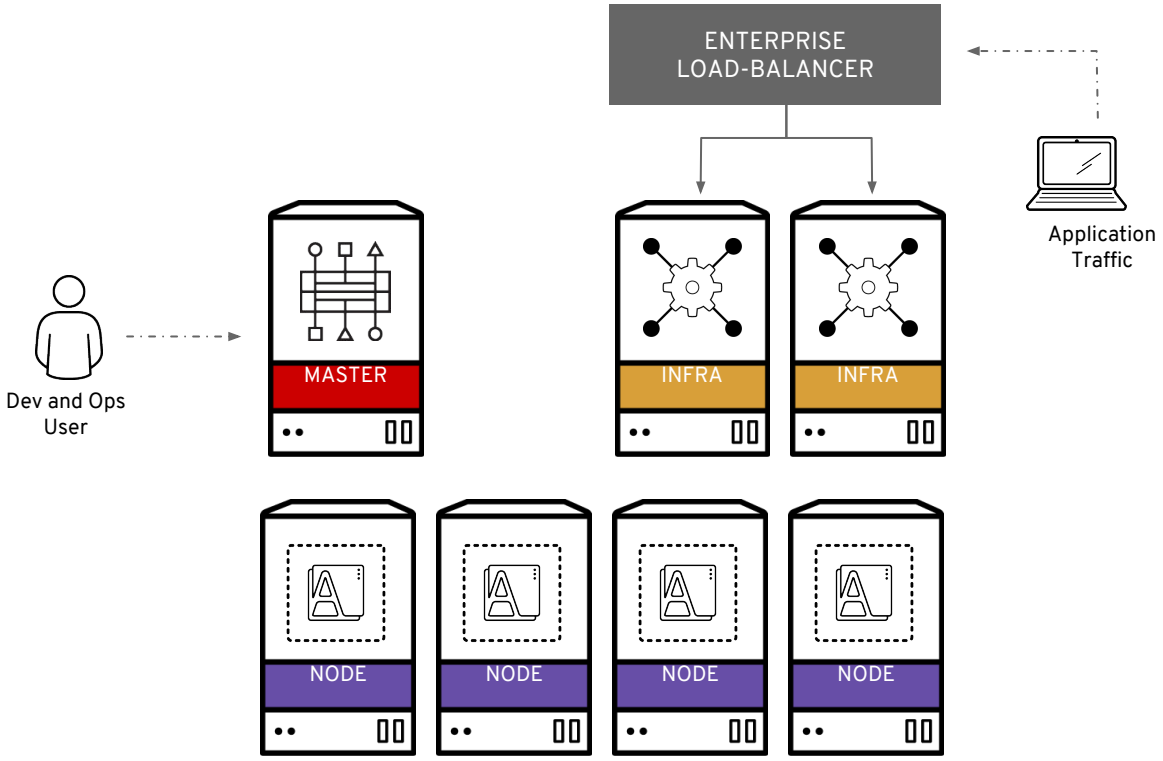
Cloud Native Applications

Proof-of-Concept Architecture



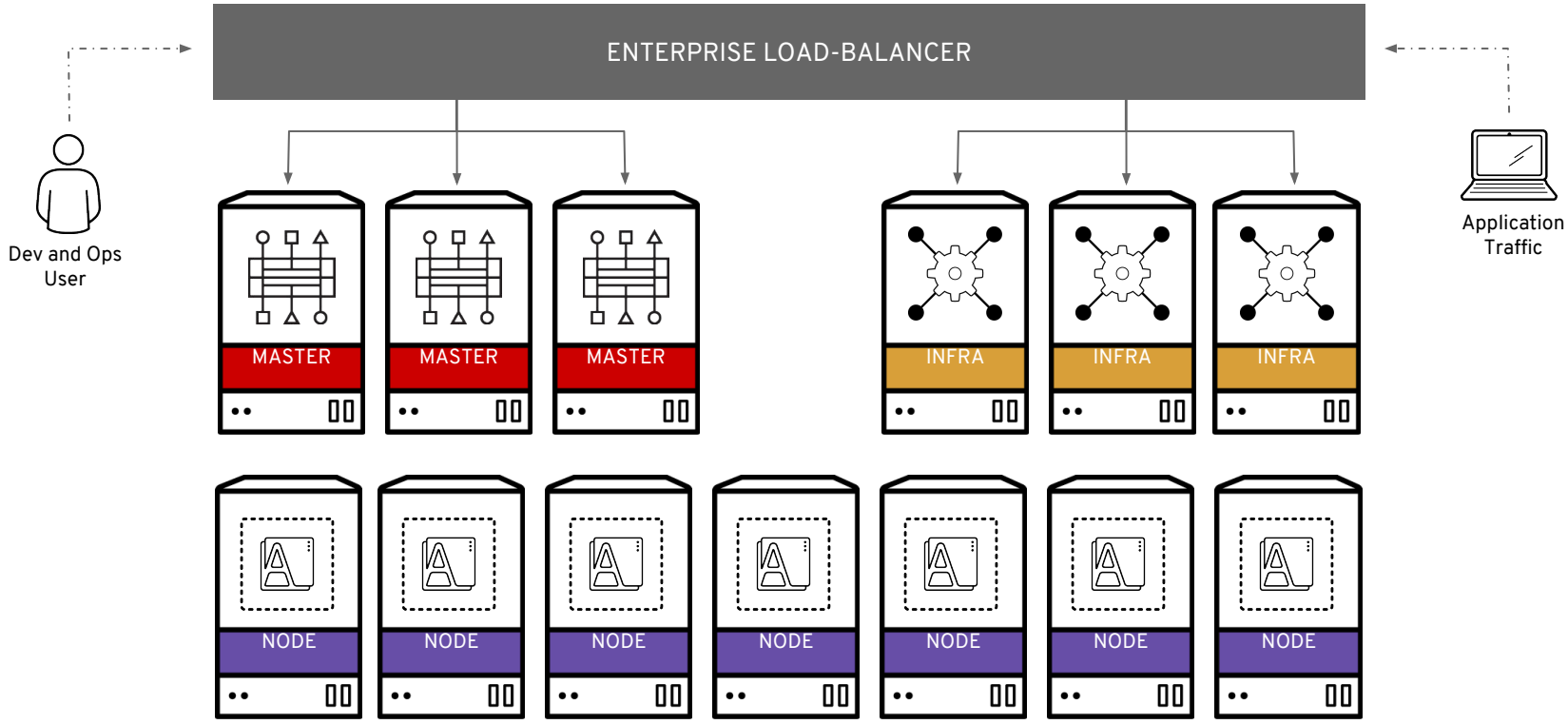
Cloud Native Applications

High-Availability Architecture



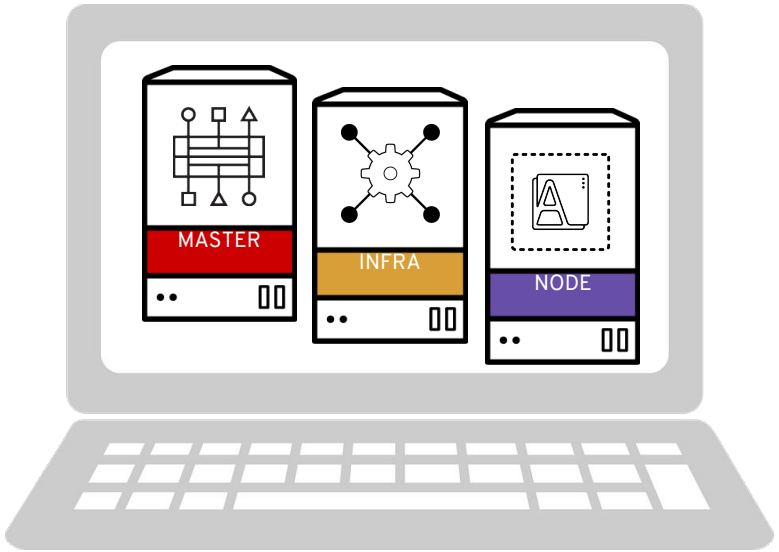
Cloud Native Applications

Full High-Availability Architecture



Cloud Native Applications

A laptop with at least 8GB of RAM to host the master, the infra and the compute nodes.



$ oc cluster up --logging=false --metrics=true …

Cloud Native Applications

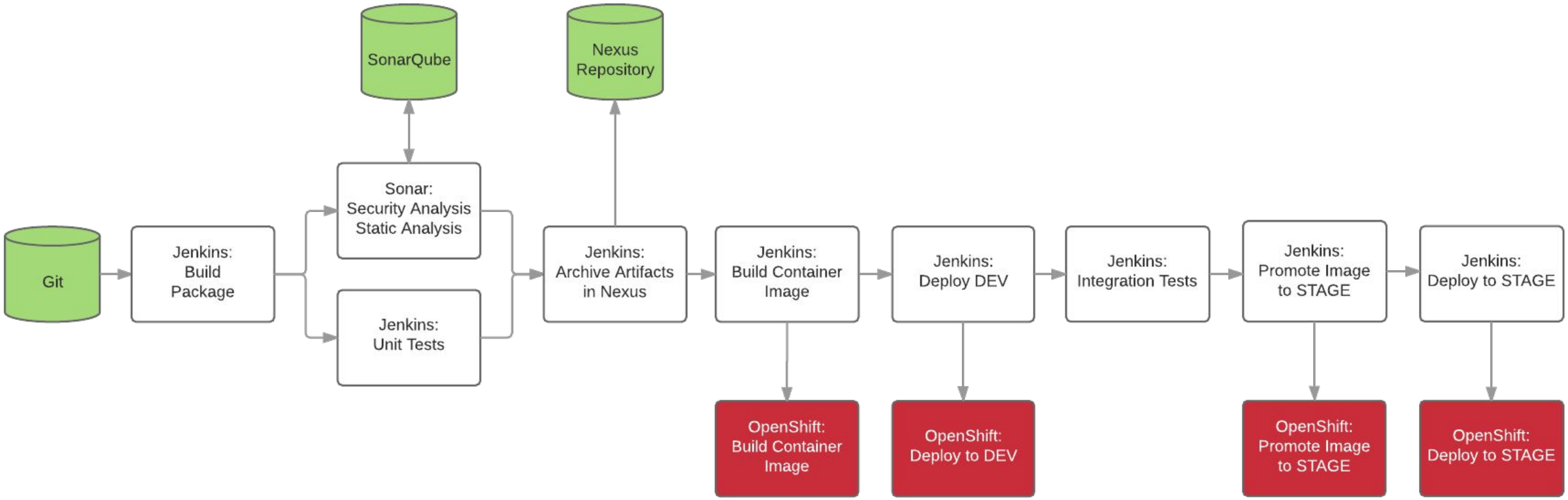
LAB and Q/A (anytime you want/need)

What you need?

- Internet
- Root/Admin access to your PC
- Docker
- JDK 1.8+
- OC – OpenShift CLI tool

https://www.okd.io/download.html#oc-platforms

Cloud Native Applications



Cloud Native Applications

Presentation and labs available at:

https://github.com/foogaro/openslava-2018

Grazie

Ciao