

OpenShift on Azure

Overview Deck

Containers Transform



Monolith



N-Tier



Microservices



Datacenter



Hosted



Hybrid



Waterfall



Agile



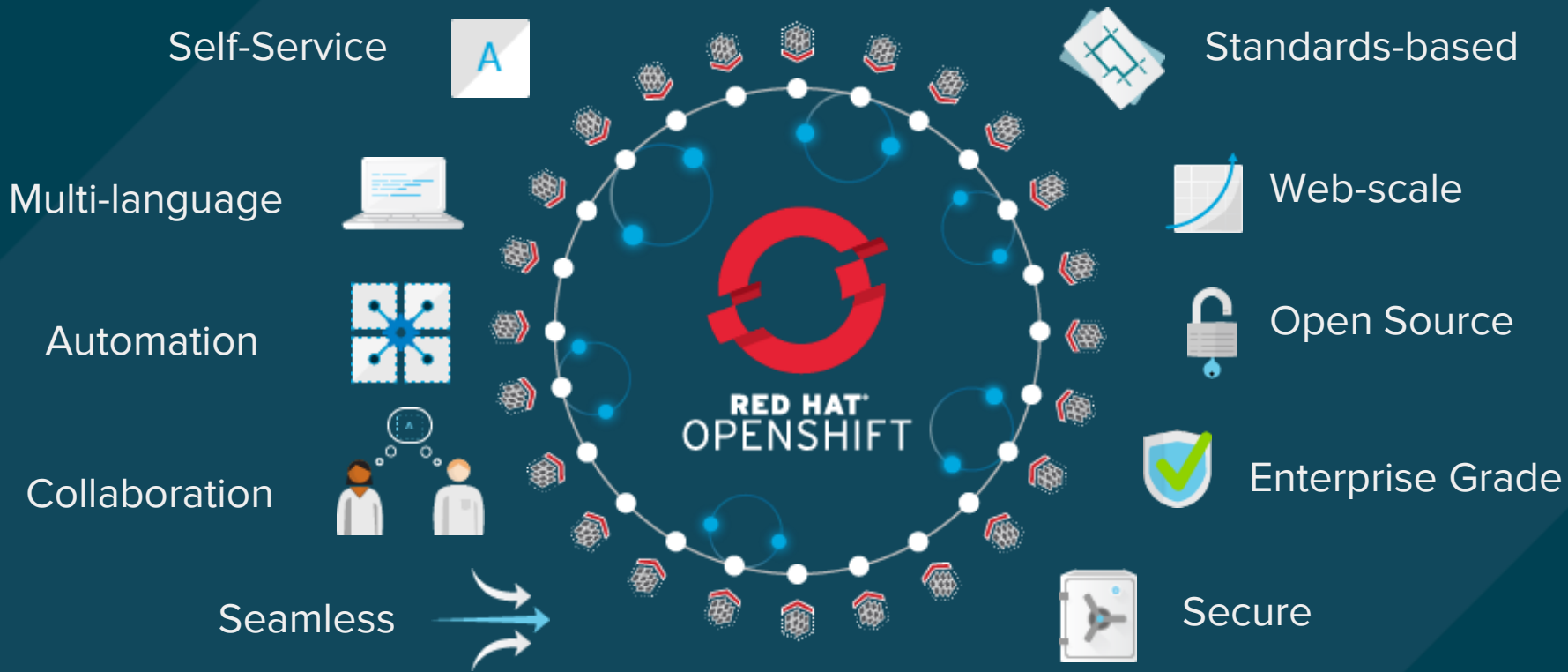
DevOps

Applications

Infrastructures

Processes

Critical features for both Dev and Ops



Openshift Container Platform

- 오픈소스 기반의 PaaS (Platform-as-a-Service)
- Kubernetes 기반의 Container 운영 플랫폼
- 템플릿 이미지와 Git을 이용하여 Image Build 자동화 구현
- Java, Spring Boot, Python, Node JS 등 다양한 이미지 제공
- Self Health Check, Auto-Scaling 지원

The Business Benefits Of Containers



5 year ROI

531%



Average Annual Benefits
per 100 Developers

\$1.29M



Payback Period

8 Months

Docker Image and Container

App code
runtime
system tools
system libraries

Build

Image

91e54df01179	AUPS branch =>> /var/lib/docker/aufs/diff/...
d745087b6632	AUPS branch =>> /var/lib/docker/aufs/diff/...
c22013c84729	AUPS branch =>> /var/lib/docker/aufs/diff/...
d5a1f33e8a5a	AUPS branch =>> /var/lib/docker/aufs/diff/...

Container



실행에 필요한 모든 것을 포함하여
Docker Format의 파일로 생성

Containers - An Evolution in Application Deployment

- Enable efficiency and automation for microservices, but also support traditional applications
- Enable faster and more consistent deployments from Development to Production
- Enable application portability across 4 infrastructure footprints: Physical, Virtual, Private & Public Cloud



Creating Application in Openshift

사용할 이미지와 소스가 있는 Git 서버의 주소를 입력하면 어플리케이션 자동 빌드 및 배포

The screenshot displays the OpenShift Container Platform interface. At the top, the header reads "OPENSHIFT CONTAINER PLATFORM" with a user profile icon for "hsyang". Below the header, there is a search bar labeled "Search Catalog" and a "My Projects" section with a "+ Create Project" button. The main content area is divided into two panels. The left panel shows a "Browse Catalog" section with a filter for "tomcat7-s2i" and a list of items, including "Tomcat7-S2I-Openshift" which is highlighted with a red box. The right panel shows the "APPLICATION" configuration for "simple", with the URL "http://simple-hsyang.ocp.rockplace.co.kr" entered. Below this, the "DEPLOYMENT" section shows "simple, #2". The "CONTAINER: SIMPLE" section displays details for the container, including the image "hsyang/simple b1a6d87", build "simple, #1", and source "Update server.xml 51cdc4f". A circular progress indicator shows "1 pod". At the bottom right, there are logos for Microsoft and Red Hat.

OPENSHIFT CONTAINER PLATFORM

hsyang

Search Catalog

My Projects + Create Project

4 of 4 Projects View All

Browse Catalog Custom Add

All Languages Databases Middleware Other

Filter 1 of 153 Items Active filters:

Keyword: tomcat7-s2i Clear All Filters

RED HAT JBOSS Tomcat7-S2I-Openshift 7.0.82

Rockplace

BUILDER TOMCAT TOMCAT7 JAVA JDK XPAAS

Rockplace Tomcat 7 S2I images.

Sample Repository: <https://github.com/Heesun-Yang/tomcat7-simple>

APPLICATION simple

<http://simple-hsyang.ocp.rockplace.co.kr>

DEPLOYMENT simple, #2

CONTAINER: SIMPLE

Image: [hsyang/simple b1a6d87](#)

314.6 MIB

Build: [simple, #1](#)

Source: [Update server.xml 51cdc4f](#)

Ports: 8080/TCP

1 pod

Cancel < Back Next >

Microsoft | redhat

Creating Application in Openshift

LANGUAGES	Java	NodeJS	Python	PHP	Perl	Ruby	.NET Core	Third-party Language Runtimes
DATABASES	MySQL	PostgreSQL	MongoDB	Redis	MS SQL	... and virtually any docker image out there!		Third-party Databases
WEB SERVERS	Apache HTTP Server	nginx	Varnish	Phusion Passenger	Tomcat			Third-party App Runtimes
MIDDLEWARE	Spring Boot	Wildfly	.NET	JBoss Web Server	JBoss EAP	JBoss A-MQ	JBoss Fuse	Third-party Middleware
	3SCALE API mgmt	JBoss BRMS	JBoss BPMS	JBoss Data Virt	JBoss Data Grid	RH Mobile	RH SSO	Third-party Middleware

Architecture Stack



OPENSHIFT

DEVOPS TOOLS & USER EXPERIENCE

LANGUAGES, RUNTIMES, MIDDLEWARE,
DATABASES, OTHER SERVICES

ORCHESTRATION & MANAGEMENT

CONTAINER API

CONTAINER HOST



OPENSHIFT

이미지 빌드, 지능형 배포, 웹 콘솔, CLI, IDE 플러그인, REST API 등을 제공



KUBERNETES

동적인 스케줄링 및 컨테이너의 클러스터 관리와 오케스트레이션



DOCKER

가벼운 Linux 컨테이너를 통한 표준 소프트웨어 패키징 메커니즘

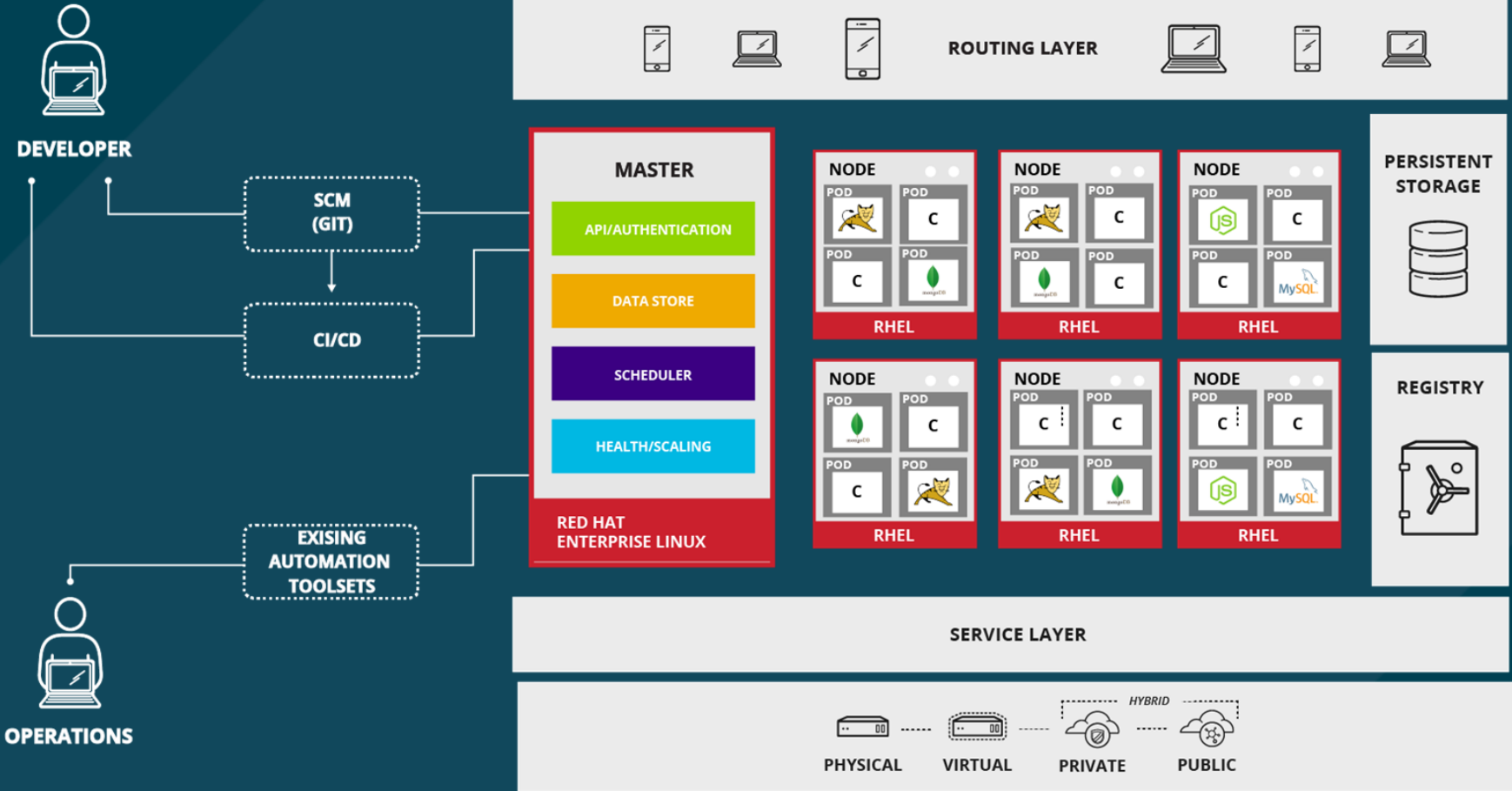


RHEL / Atomic

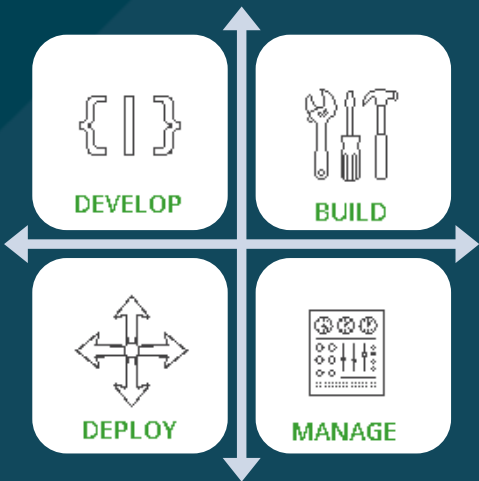
컨테이너에 최적화 된 엔터프라이즈 급 Linux 운영 체제



10,000 foot overview



Core Features



- **DevOps**

웹 콘솔, CLI (Command-Line Interface) 또는 IDE (Integrated Development Environment)를 사용하여 빌드 및 배포, 테스트 가능

- **빌드 자동화 / CI/CD**

SCM(Git) 에 있는 소스를 이용하여 자동으로 CI / CD 구현 및 이미지 빌드 가능

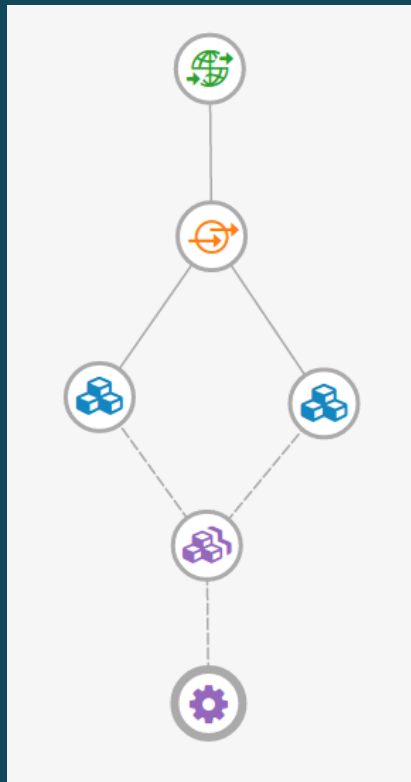
- **배포 / Rollback**

- Rolling 배포 방식을 통해 무 중단 배포 가능
- Canary, Blue / Green 배포 가능
- 문제 발생 시 이전에 배포했던 이미지를 보관하고 있으므로 이를 통해 쉽고 빠른 Rollback 가능

- **모니터링 / Auto Scaling**

웹 콘솔을 통해 실시간으로 모니터링 가능하고 급격한 부하 증가 시 자동 확장

Application on Openshift



Route
web.rockplace.co.kr

Service
172.30.176.102

Pod
10.10.2.5, 10.10.2.6

ReplicationController

DeploymentConfig

Source To Image

Code



DEV

Build

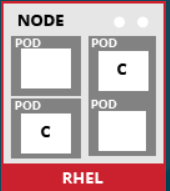
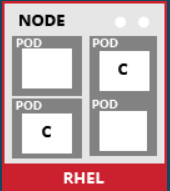
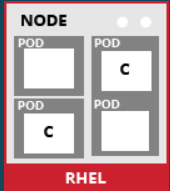


Container Image



Registry

Deploy



OPS



CI / CD Pipeline

OPENSHIFT CONTAINER PLATFORM 🔔 ? hsyang

☰ ci ▼ Add to Project

- Overview
- Applications >
- Builds >
- Resources >
- Storage
- Monitoring

Pipelines [Learn More](#)

[cart-service-pipeline](#) created 13 minutes ago Start Pipeline

Source Repository: <https://github.com/siamaksade/cart-service.git>

Recent Runs Average Duration: 10m 14s

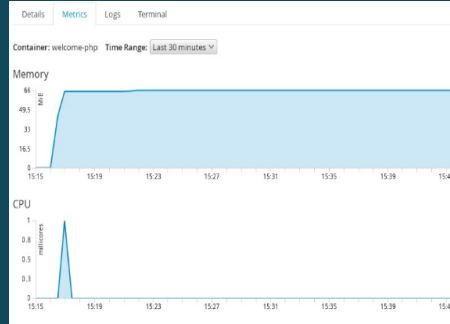
✔ Build #1 11 minutes ago View Log	Build 4m 48s	→	Test 4s	→	Build Image 47s	→	Deploy 2m 54s	→	System Test 2s
--	------------------------	---	-------------------	---	---------------------------	---	-------------------------	---	--------------------------

[View Pipeline Runs](#) | [Edit Pipeline](#)

Monitoring / Auto Scaling

• 모니터링

POD 의 CPU 및 Memory 상태를 로그를 모니터링 가능



The screenshot shows the logs for a container named 'simple-war-eap70'. The logs contain several warning messages and a successful startup message:

```
1 WARNING: Environment variable OPENSIFT_KUBE_PING_NAMESPACE undefined. Clustering will be unava
2 WARNING: No password defined for JGroups cluster. AUTH protocol will be disabled. Please define JGROUP
3 Missing SSO_URL. Unable to properly configure SSO-enabled applications
4 Running jboss-eap-7/eap70-openshift image, version 1.4.34
5
6
7 JBoss Bootstrap Environment
8
9 JBOSS_HOME: /opt/eap
10
```

• 확장

시스템 사용이 늘어나는 경우 Manual 또는 Auto-Scaling 방식으로 Pod를 확장가능

The screenshot shows the deployment configuration for 'simple-war-eap70'. It displays the container name 'SIMPLE-WAR-EAP70', the image 'hsyang/simple-war-eap70', and the ports '8080/TCP', '8443/TCP', and '8778/TCP'. A circular progress indicator shows '1 pod'.

The diagram shows a transition from 1 pod to 2 pods. On the left, a grey arrow points upwards. In the center, a circular progress indicator shows '2 pods'.

Manual Scale Out

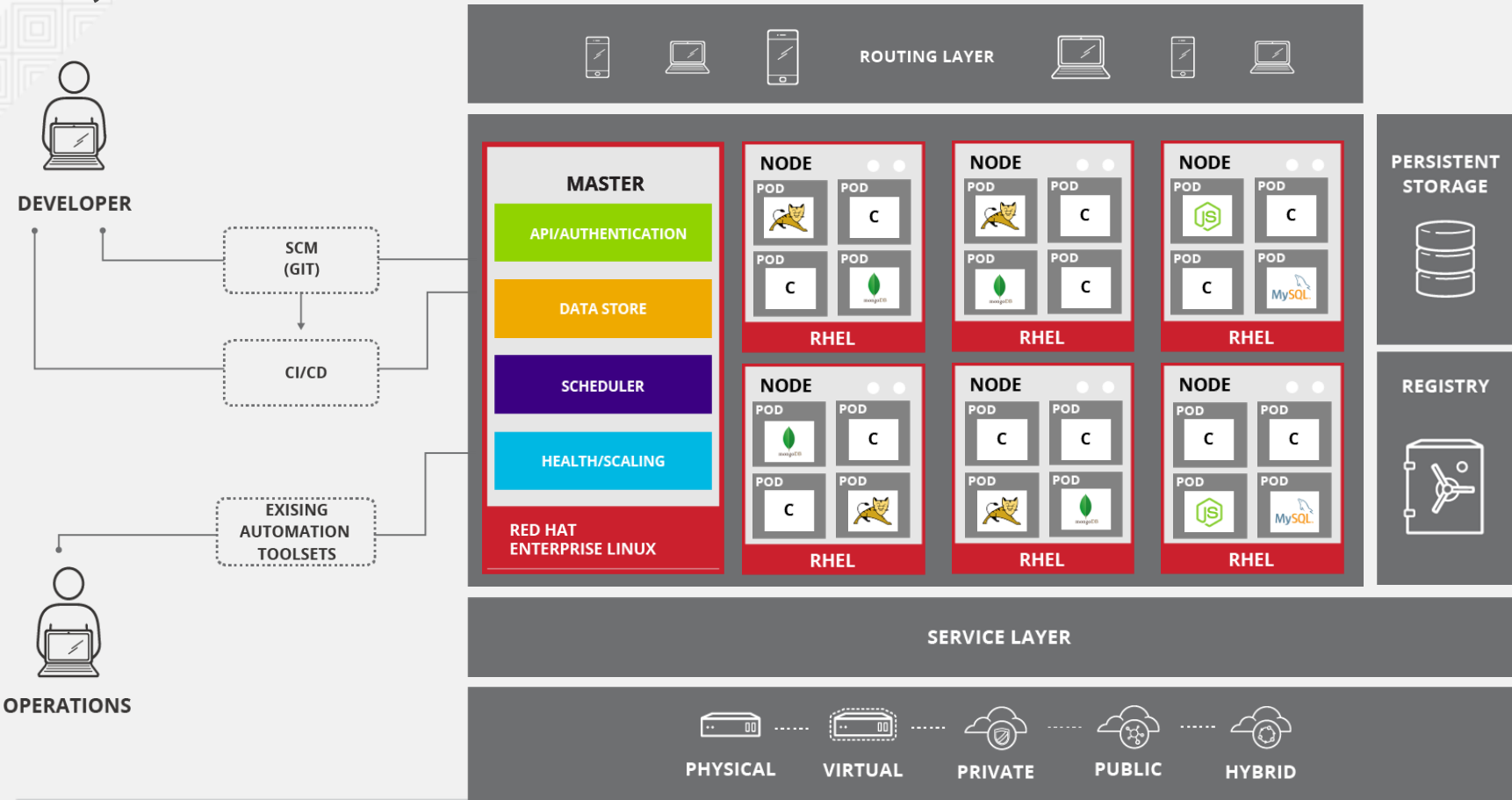
Auto Scaling

The diagram shows a transition from 1 pod to 4 pods. A circular progress indicator shows '4 pods' with a note below it: 'Autoscaled: min: 1, max: 4'.

OpenShift

Optional Slides

10,000 foot overview



OpenShift runs on your choice of infrastructure



PHYSICAL



VIRTUAL



PRIVATE

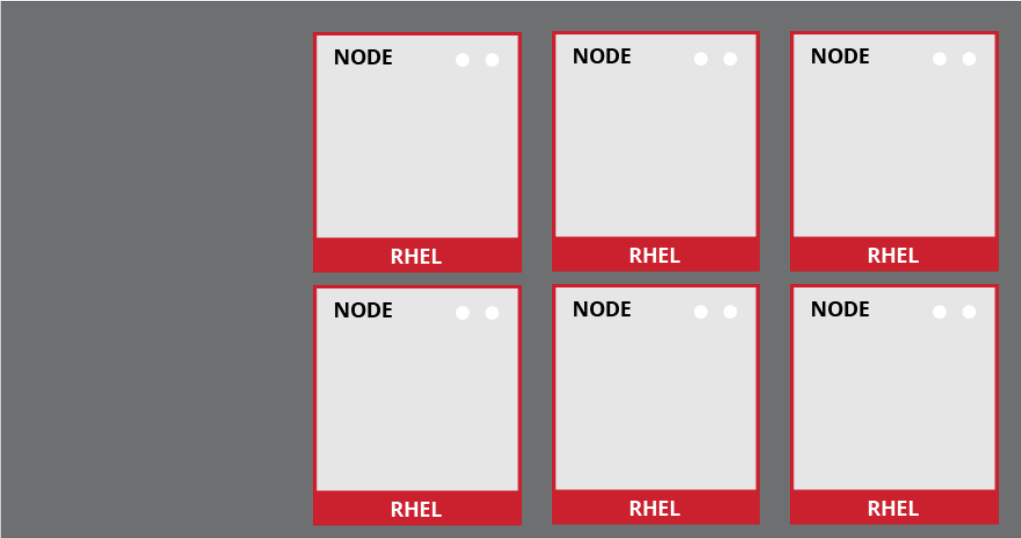


PUBLIC



HYBRID

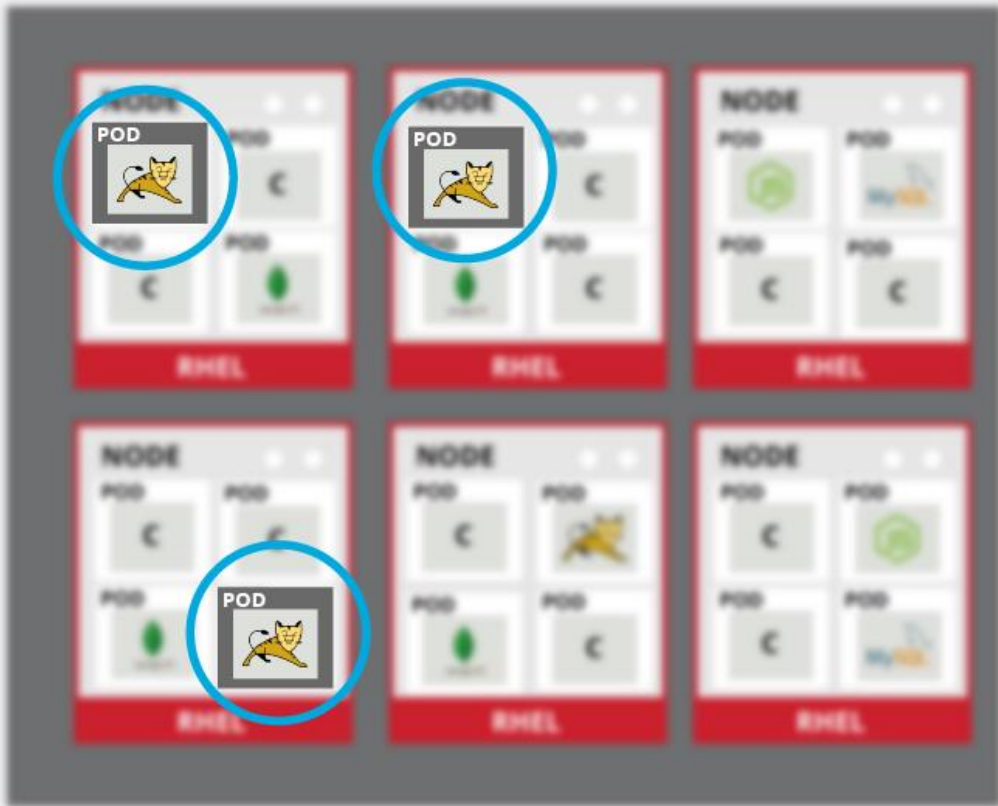
Nodes are instances of RHEL where apps will run



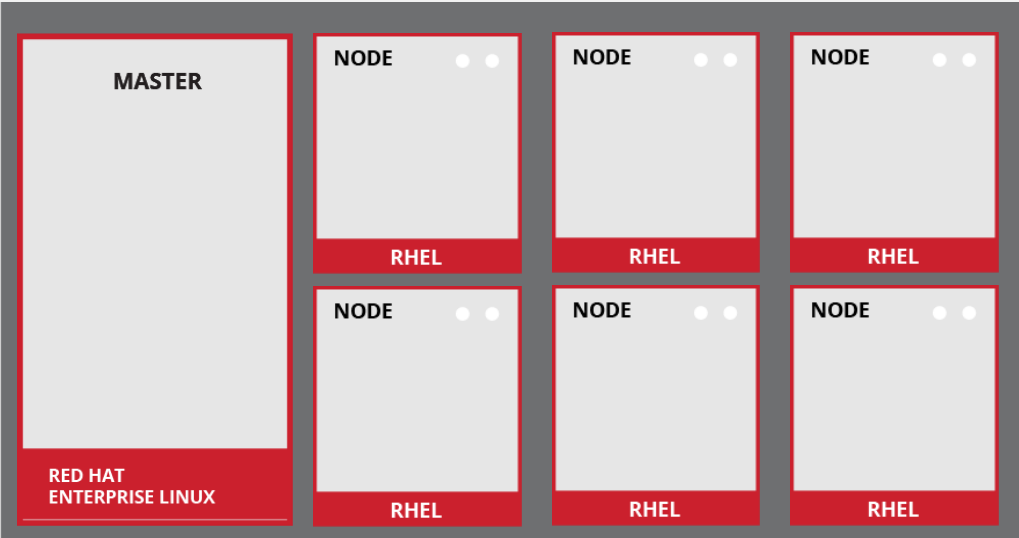
Apps and components run in containers



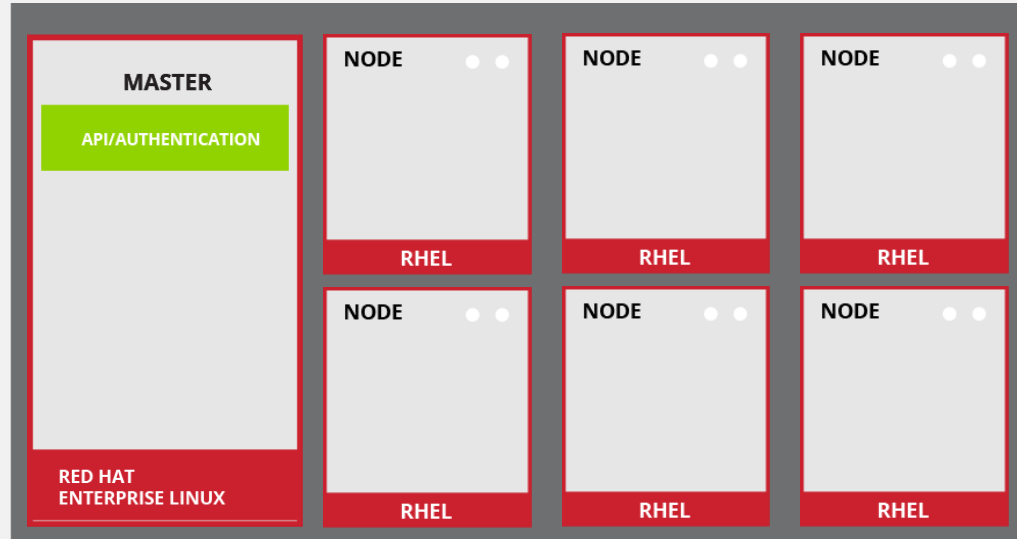
Pods are the orchestrated unit in OpenShift



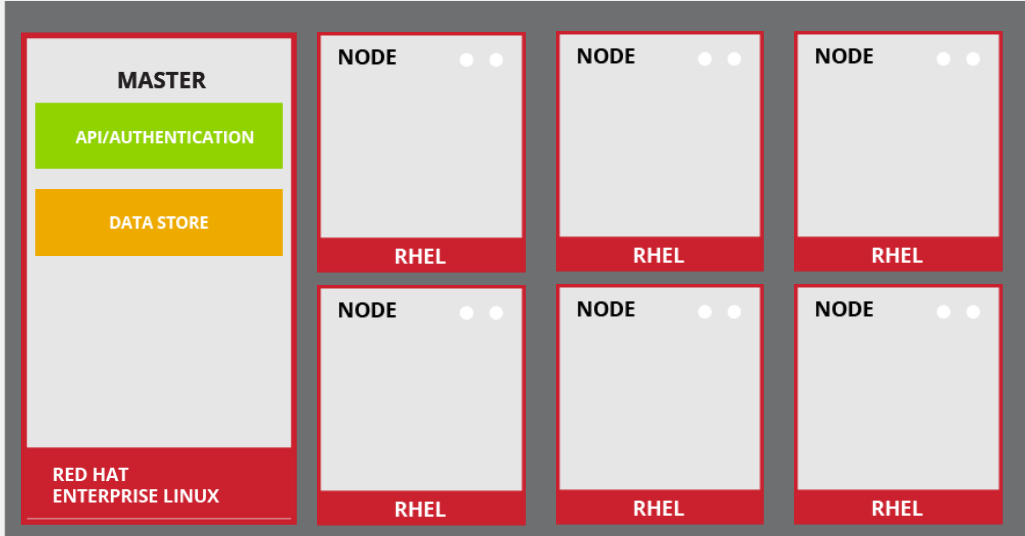
Masters are the Control Plane



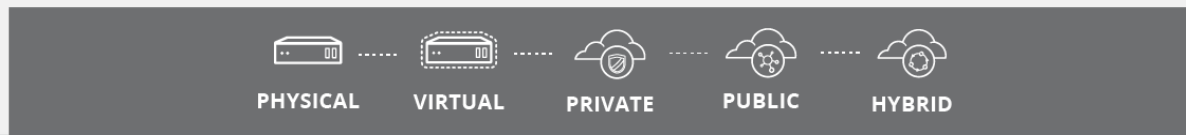
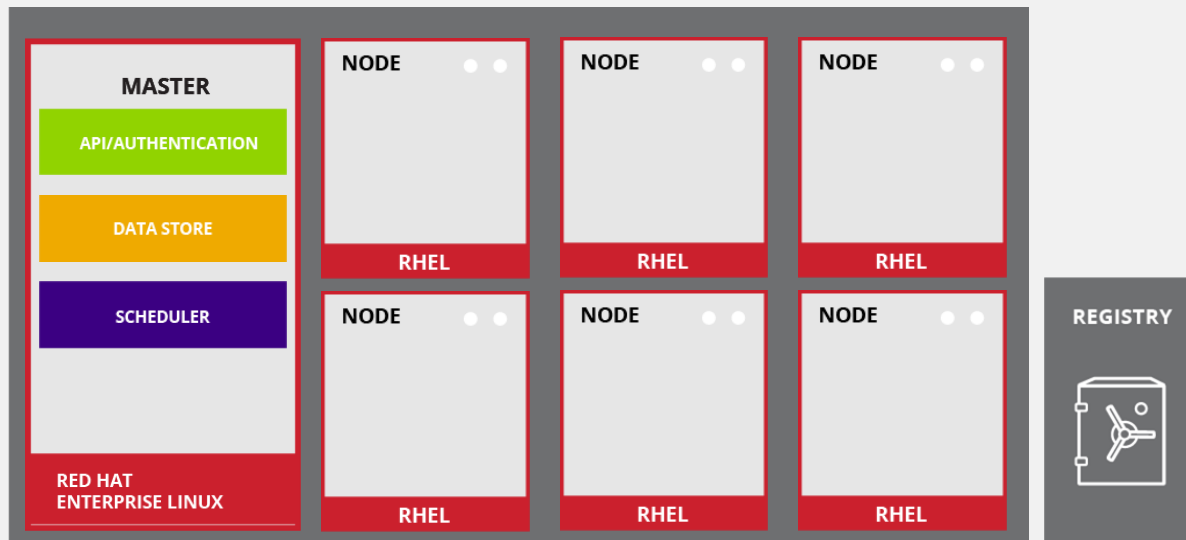
API and Authentication



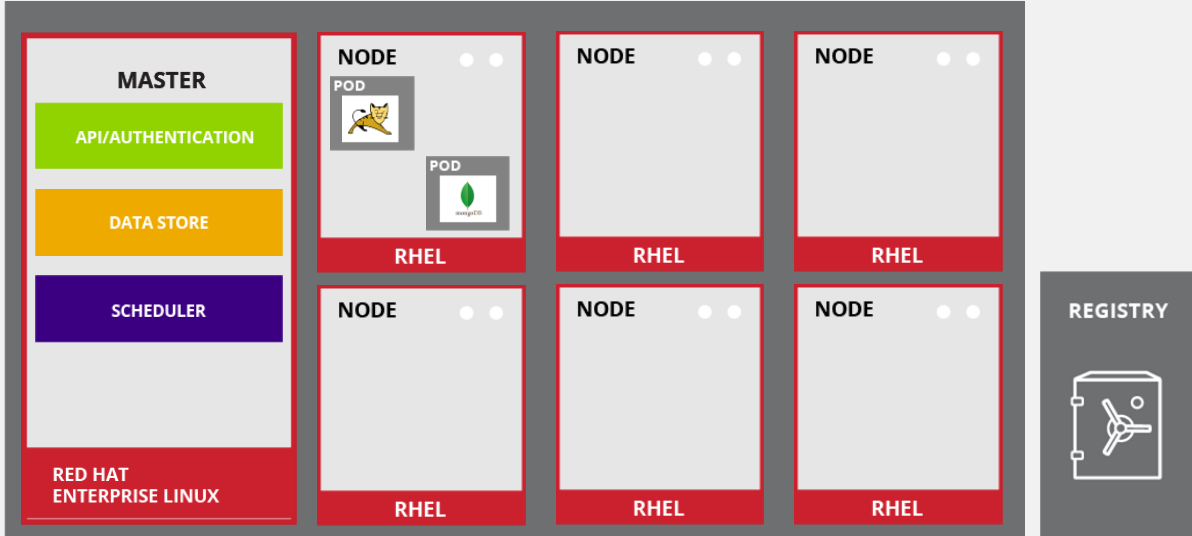
Desired and Current State



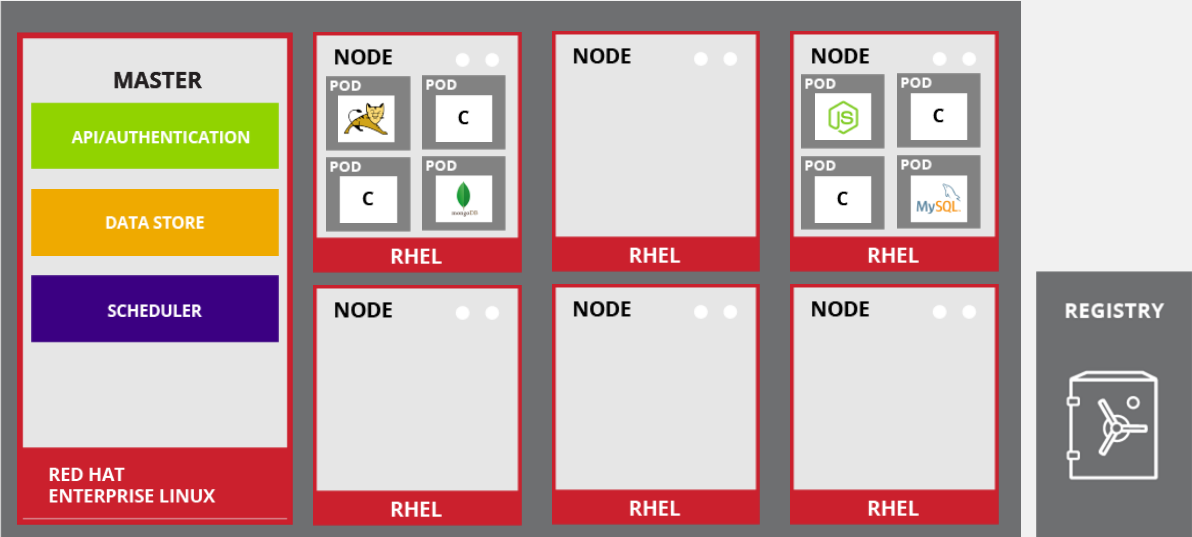
Scheduler Pulls From The Registry



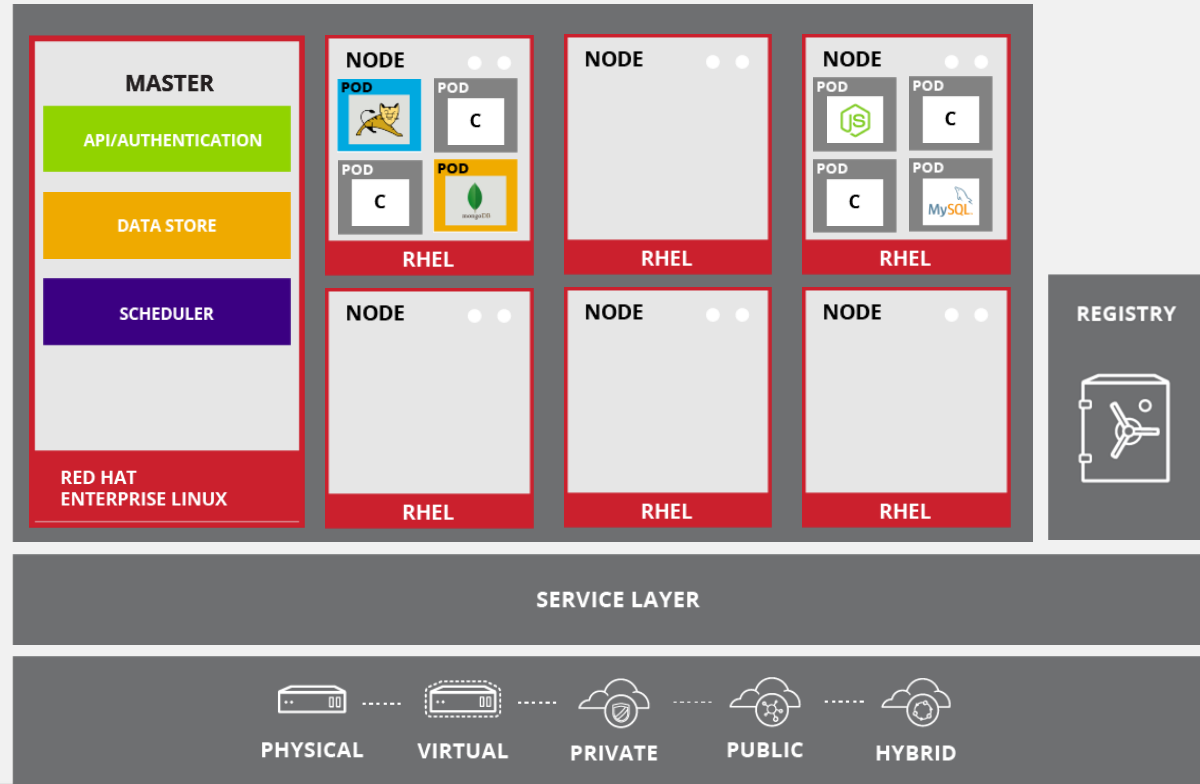
Orchestration and Scheduling



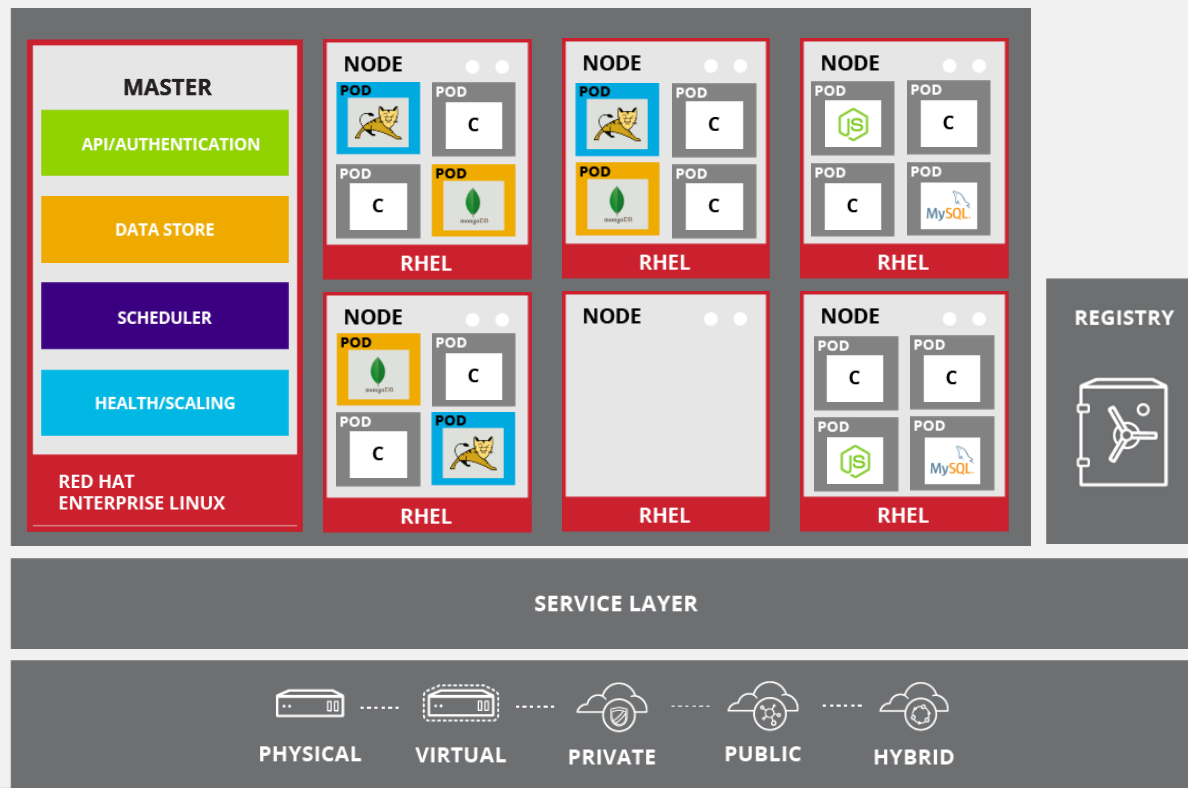
Placement by Policy



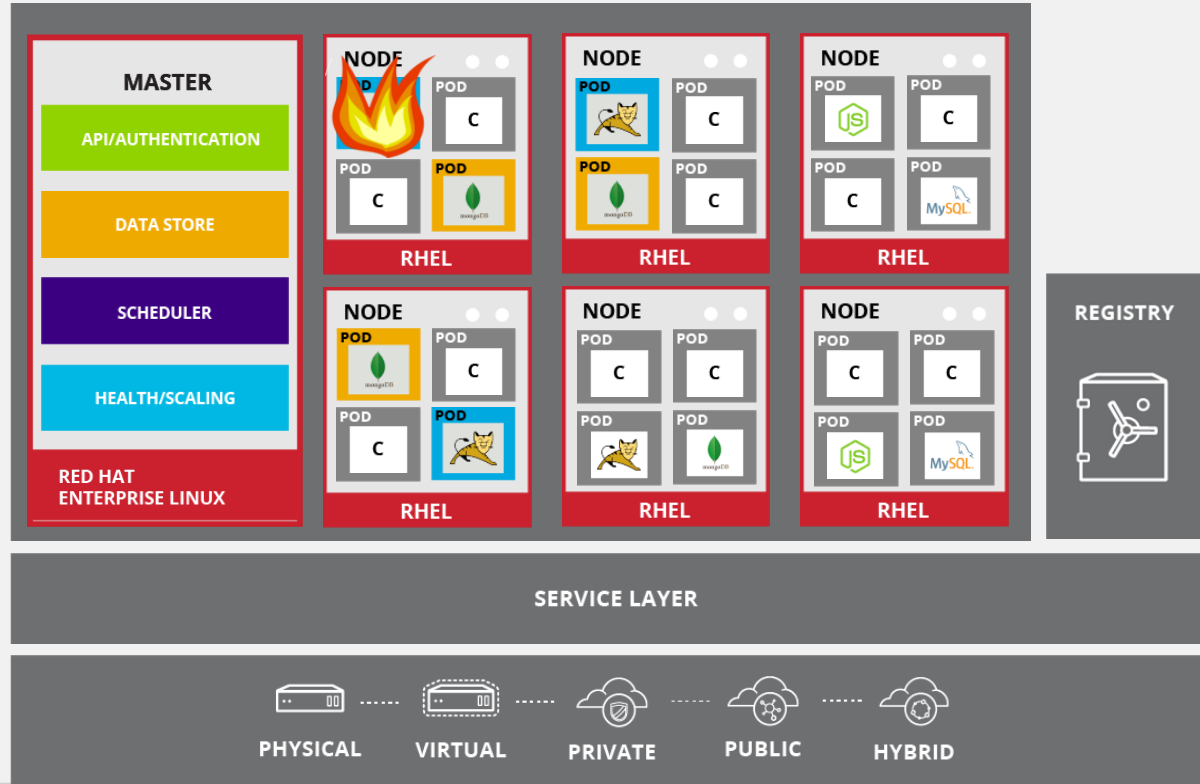
Services connect application components



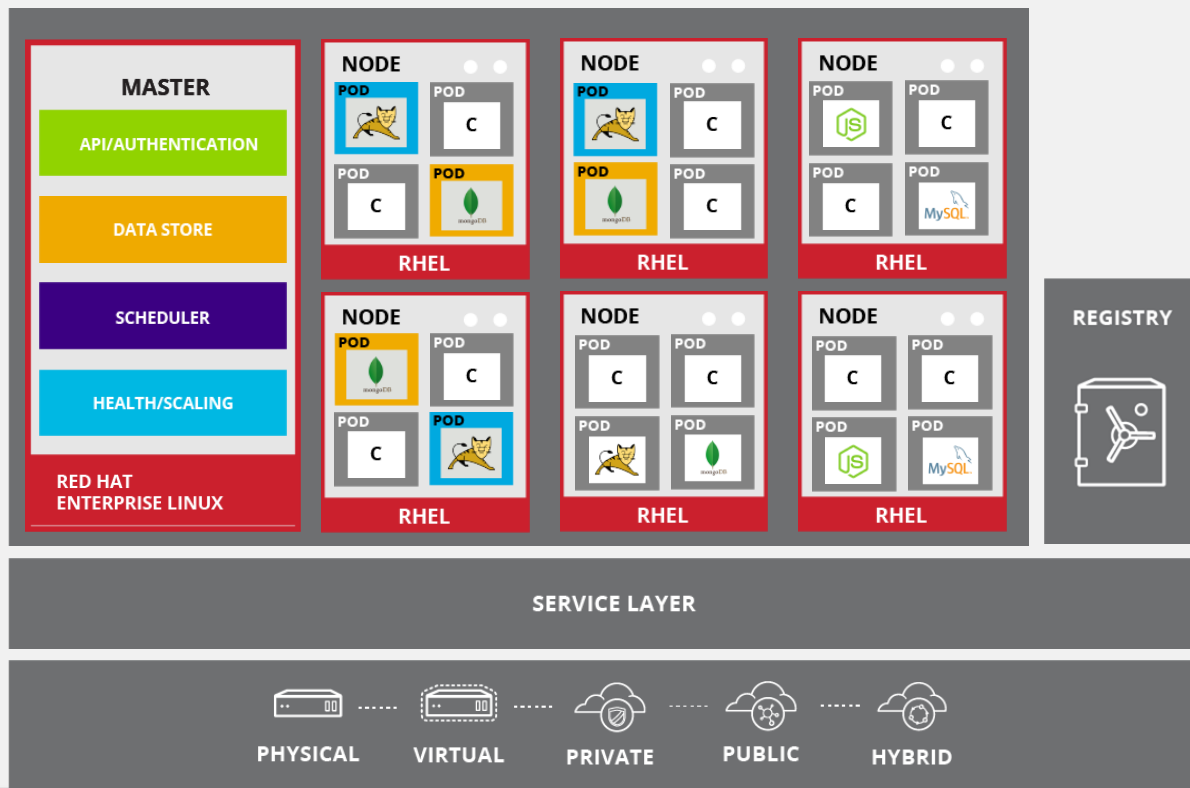
Health and Scaling



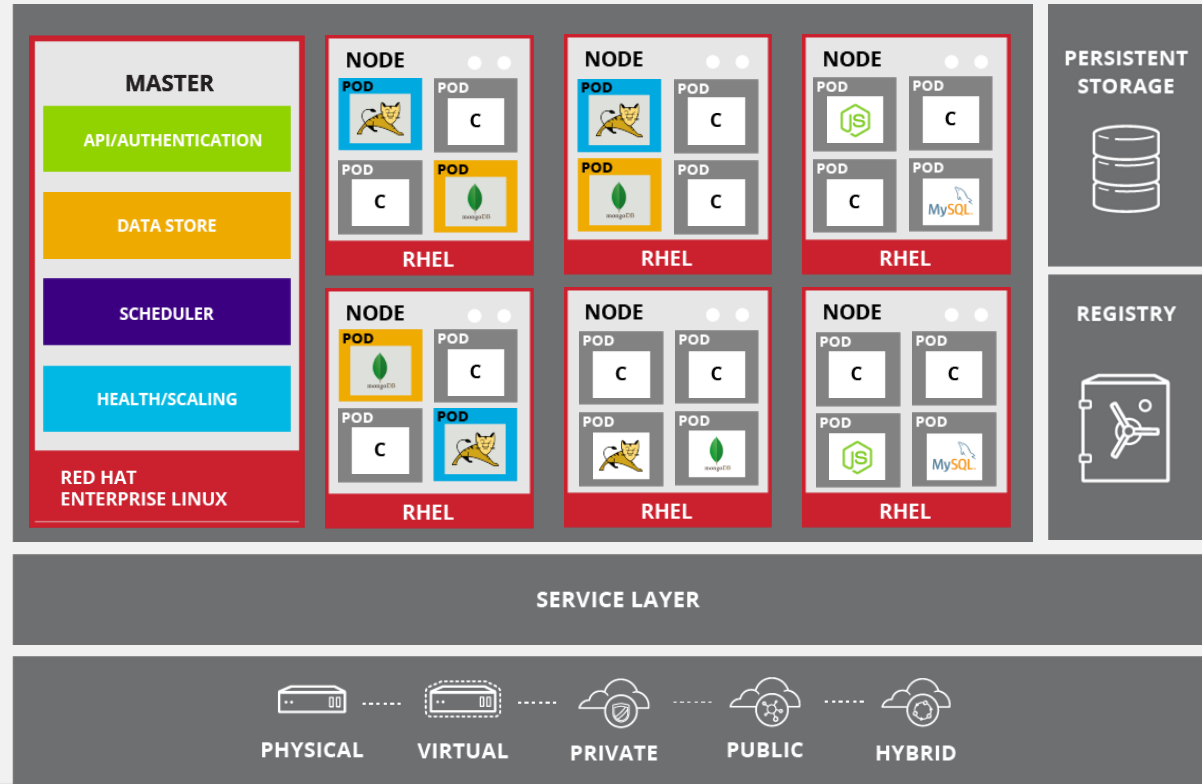
What about unhealthy Pods?



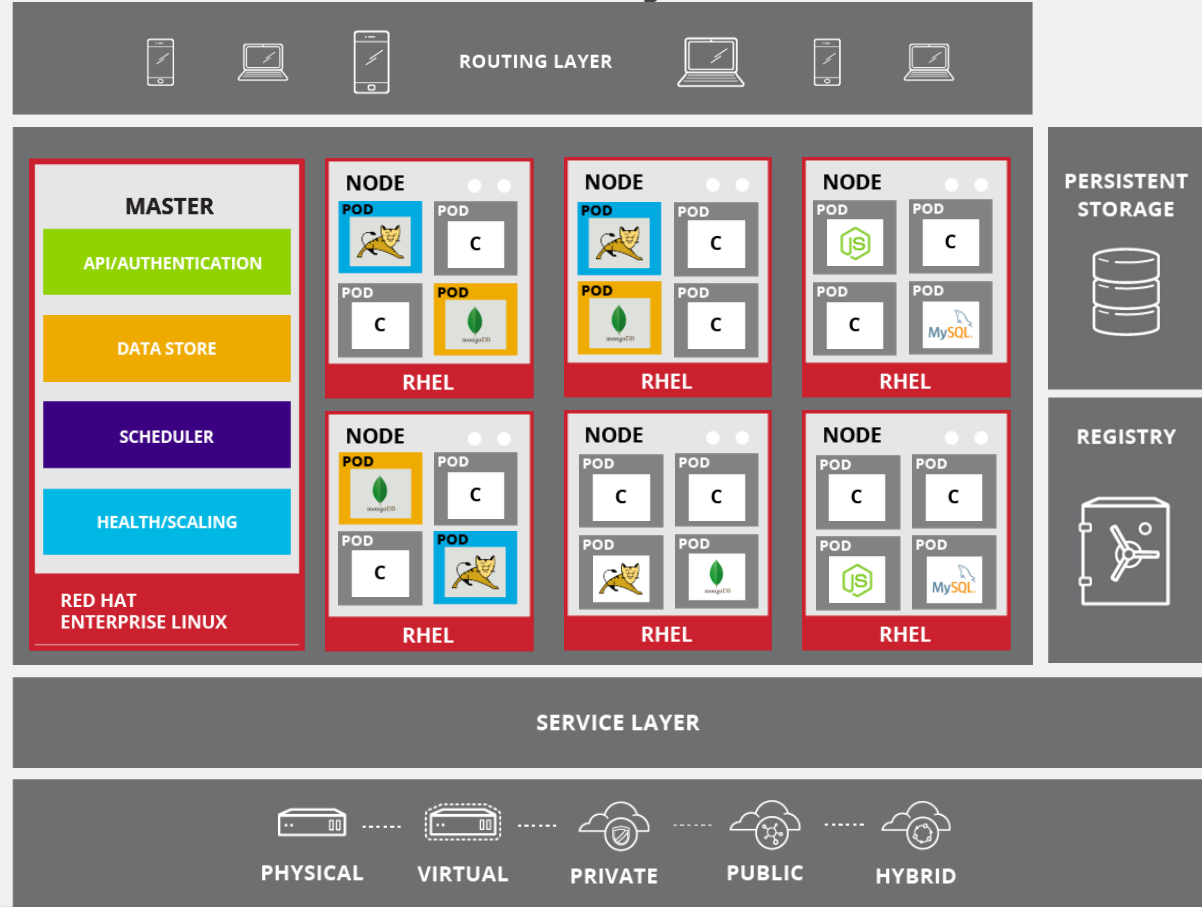
The Master remediates Pod failures



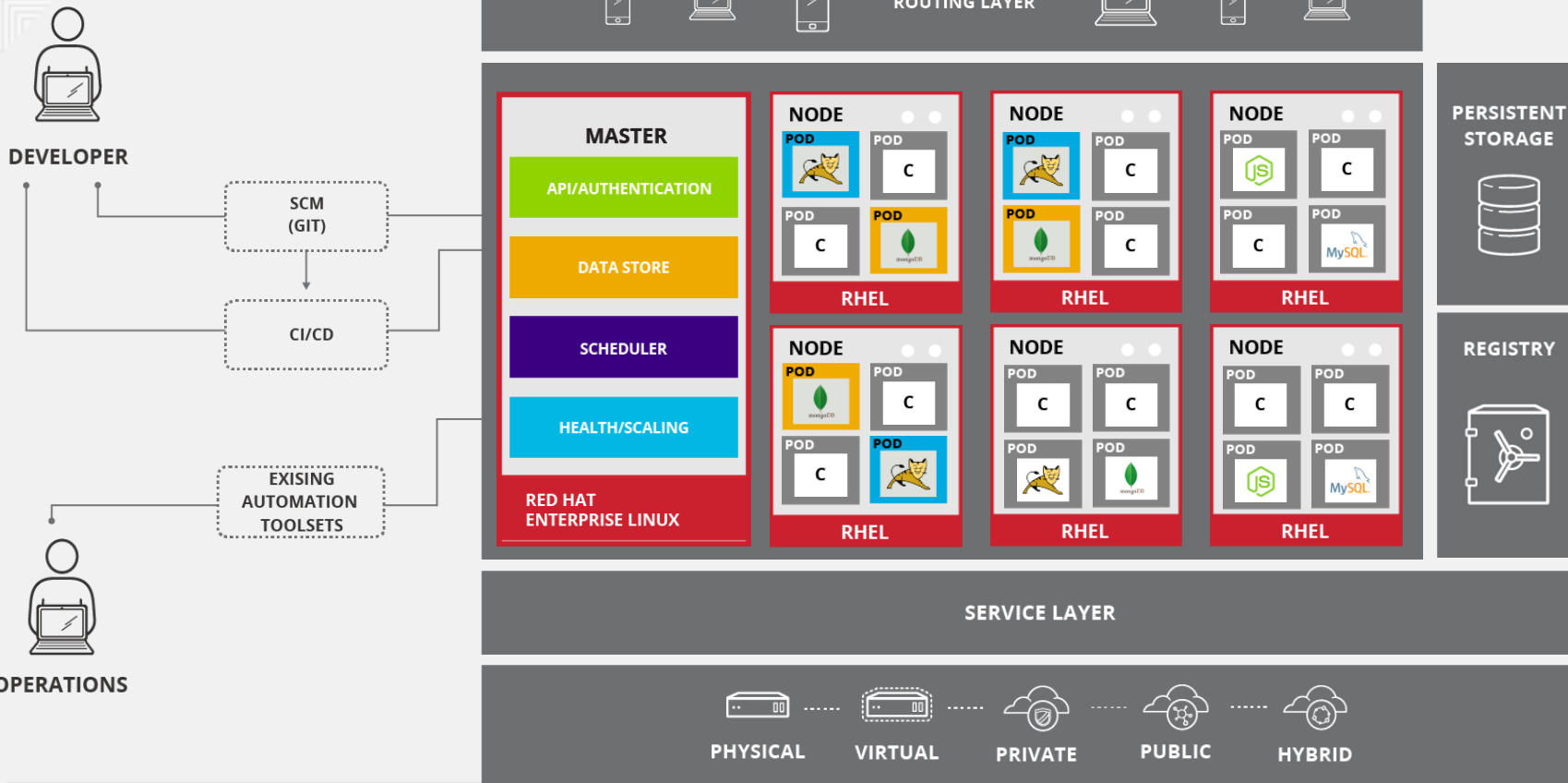
What about app data?



Routing layer for external accessibility



Access via Web UI, CLI, IDE, API



OpenShift on Azure – where it fits

