



The Containers and Cloud-Native Roadshow Developer Track

A hands-on experience for developers



- \$ MAN WHOAMI?
- WHAT I WANT TO LEARN
- FUN FACT (OPTIONAL)

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Josh Smith





Software driven innovation explosion

The IDC predicts that from 2018 to 2023, 500 million new logical apps will be created, equal to the number built over the past 40 years.

Customers and businesses expect...

ON-DEMAND
SERVICE

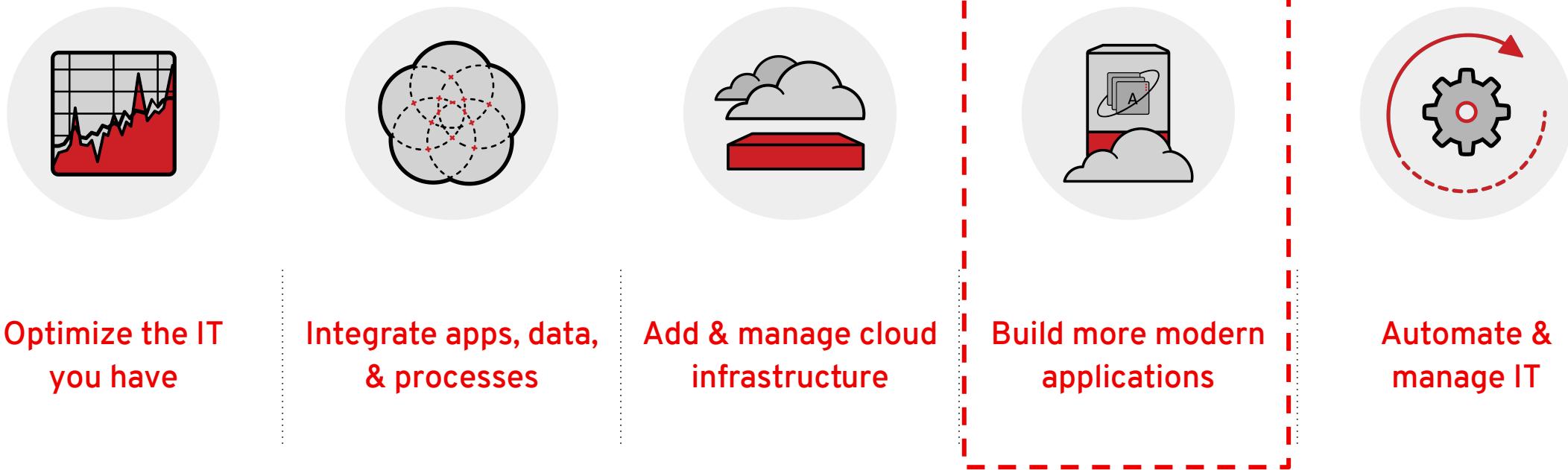
DELIGHTFUL
INTERACTIONS

ACCESS FROM
ANYWHERE

PERSONALIZED
EXPERIENCE

Creating value depends on your ability
to develop and deliver
high quality applications faster.

How do you drive innovation to meet these expectations
while keeping the lights on?

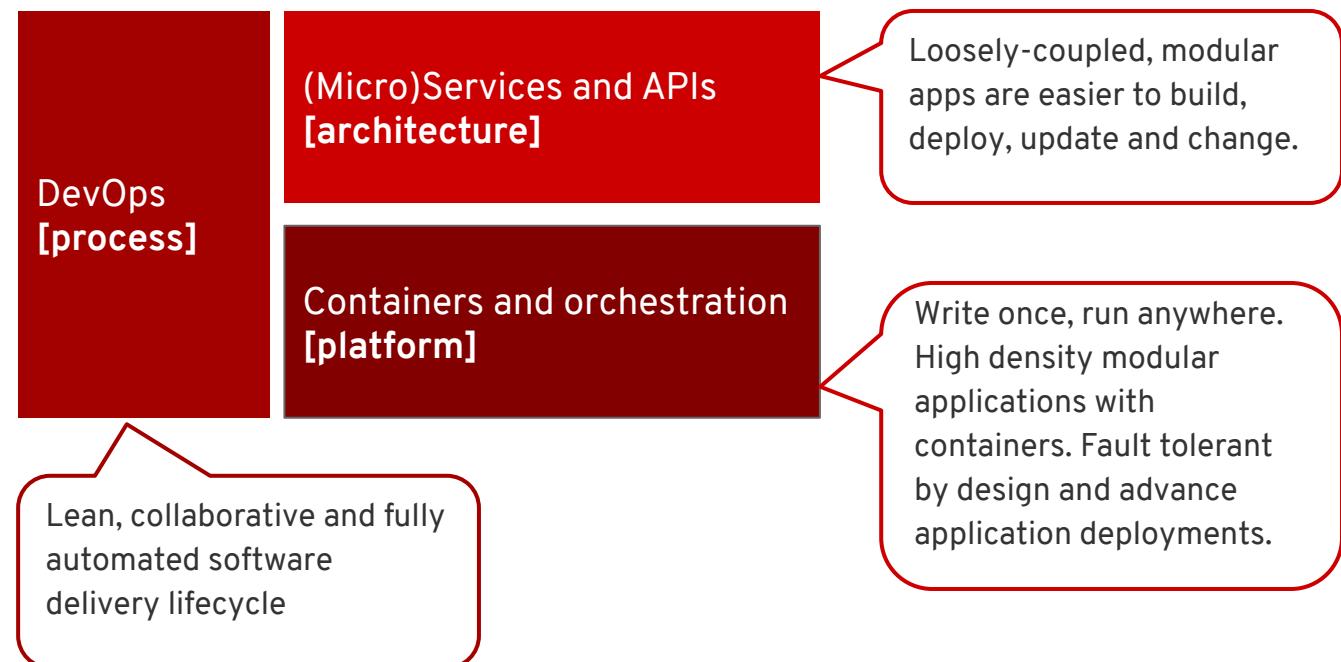


Leveraging the cloud becomes a key strategy for success

A new Innovation model is required to keep pace with business change

Cloud Native Development

Applications adopting the principles of DevSecOps CI/CD practices to create (Micro)Services packaged as Containers orchestrated by Platforms running on top of Cloud infrastructure



WHY CLOUD-NATIVE APPS?



**FASTER
SERVICE DELIVERY**



**INCREASE
SERVICE QUALITY**



**REDUCE
RISK OF DELIVERY**



How does one build apps for the cloud?



Write once, run anywhere?



THE PATH TO CLOUD-NATIVE APPS

A DIGITAL DARWINISM

RE-ORG TO
DEVOPS

SELF-SERVICE
ON-DEMAND
INFRA

AUTOMATION

CONTINUOUS
DELIVERY

ADVANCED
DEPLOYMENT
TECHNIQUES

MICROSERVICES
.....
FAST
MONOLITH

Creating value depends on your ability to deliver applications faster

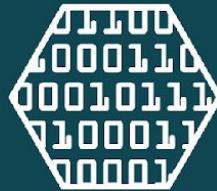
Cloud-native
applications



AI & machine
learning



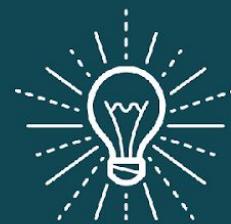
Analytics



Internet of
Things



Innovation
culture



Containers, Kubernetes, and hybrid cloud are key ingredients.
OpenShift is the best platform to deliver container-based applications.

RED HAT CLOUD-NATIVE DEV PLATFORM

Our vision is to simplify the creation of cloud-native services and serverless functions with a rich set of components and tools to match the **workloads** of modern cloud native apps.

Automate Kubernetes application operations with DevOps in mind

Cloud-native middleware applications services and service mesh

Tools and standard processes to increase developer productivity on Kubernetes



OpenShift

Automate Kubernetes application operations with DevOps in mind



Trusted enterprise Kubernetes

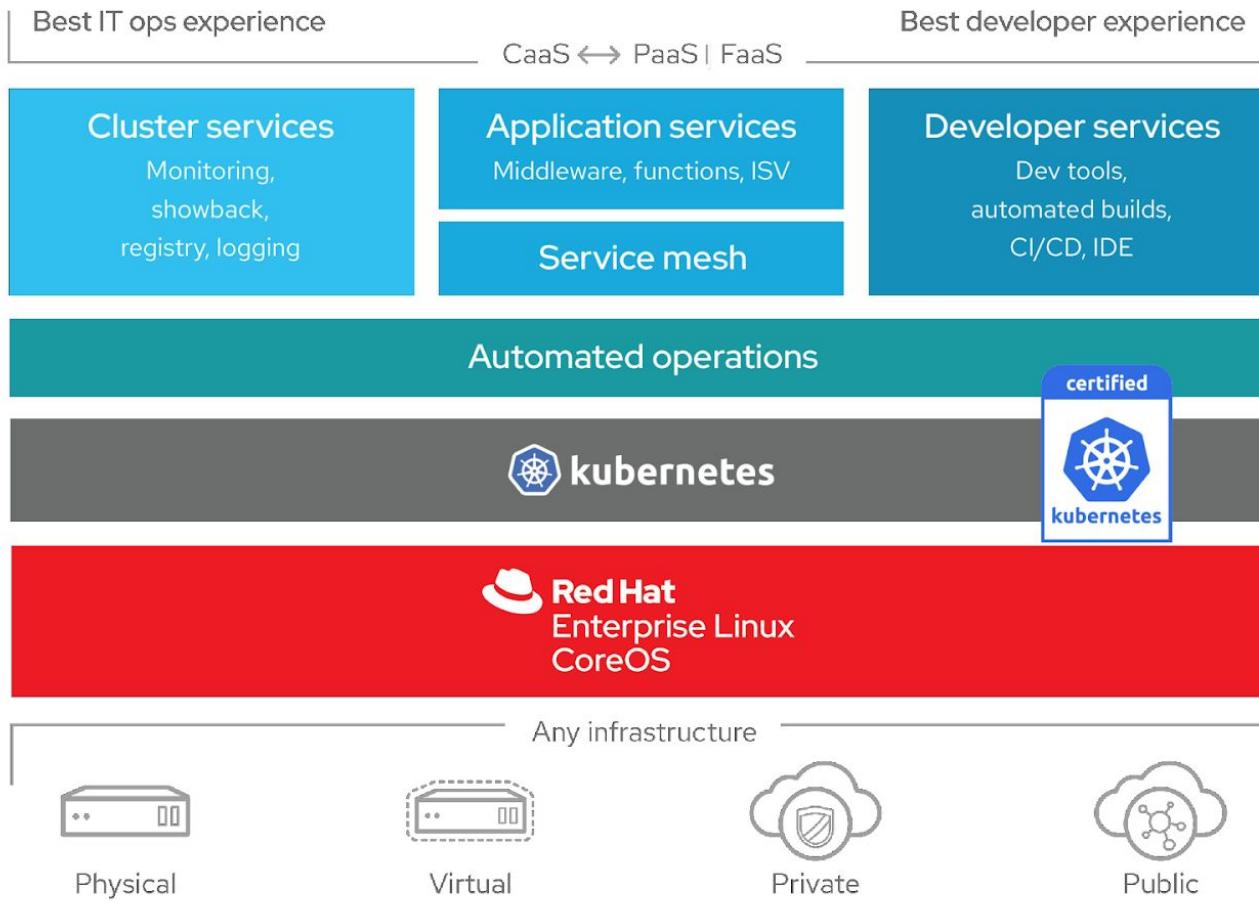


Trusted host, content,
platform

Full-stack automated
installation

Seamless updates

OpenShift 4 - A smarter Kubernetes platform



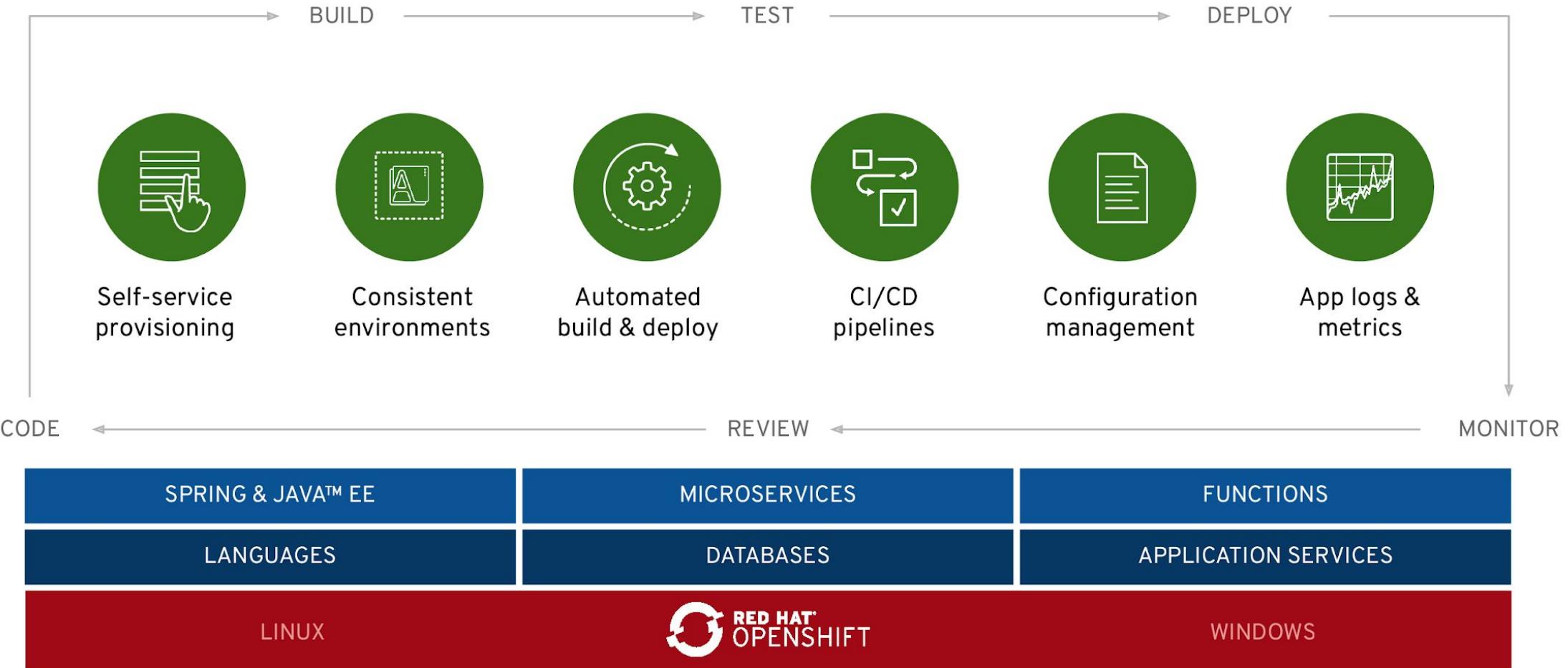
Automated, full-stack installation from the container host to application services

Seamless Kubernetes deployment to any cloud or on-premises environment

Autoscaling of cloud resources

One-click updates for platform, services, and applications

OpenShift enables developer productivity



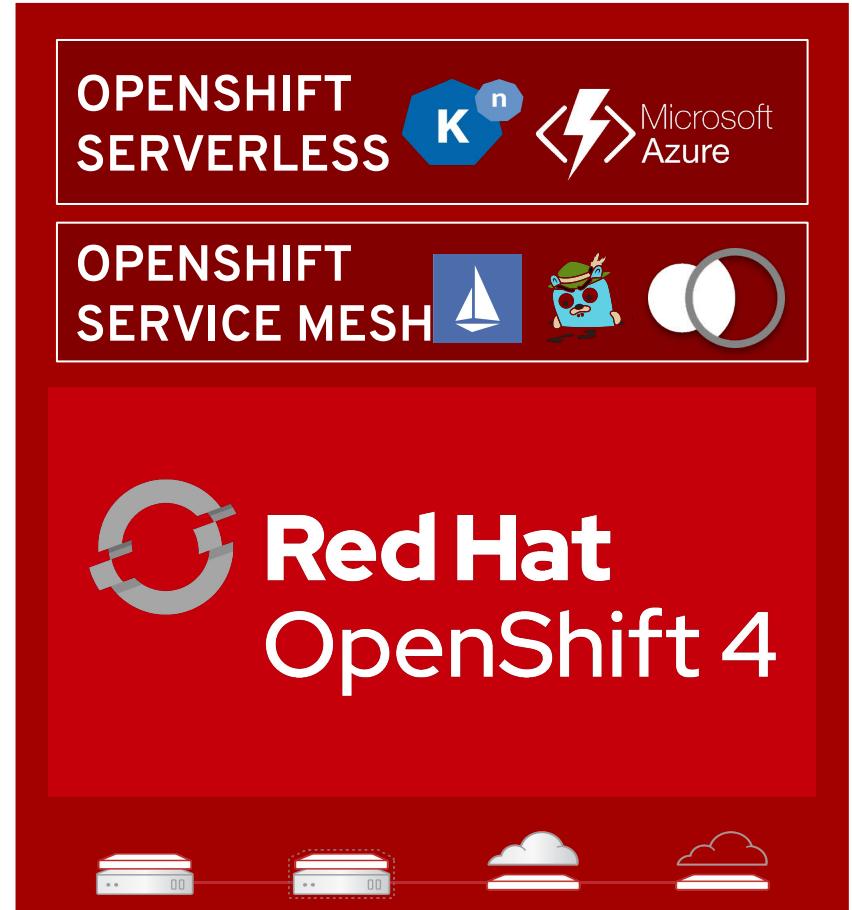
Building next-gen applications

OpenShift Service Mesh

- Integrated Service Mesh for enhanced security and network segmentation of microservices applications. Combines Istio, Kiali (UI), and Jaeger (Tracing) projects.

OpenShift Serverless

- Integrated serverless, enabling scale-to-zero FaaS services and event sources - built on the Knative framework.
- Support for Azure Functions
- Integrated with Camel-k for rich set of initial event sources: HTTP, Kafka, AMQP



Why customers choose Red Hat OpenShift

The infographic is organized into three main sections, each enclosed in a dotted box:

- Trusted enterprise Kubernetes**: Features a diagram of a server rack with a network of nodes connected to it.
- Cloud-like experience everywhere**: Features the Red Hat OpenShift logo (a red circle with a white gear) above two clouds, one containing a network icon and the other a shield icon.
- Empowering developers to innovate**: Features logos for Spring, Node.js, Docker, and Kafka, along with a smartphone displaying various app icons.

Below these sections is a horizontal row of open source technology logos:

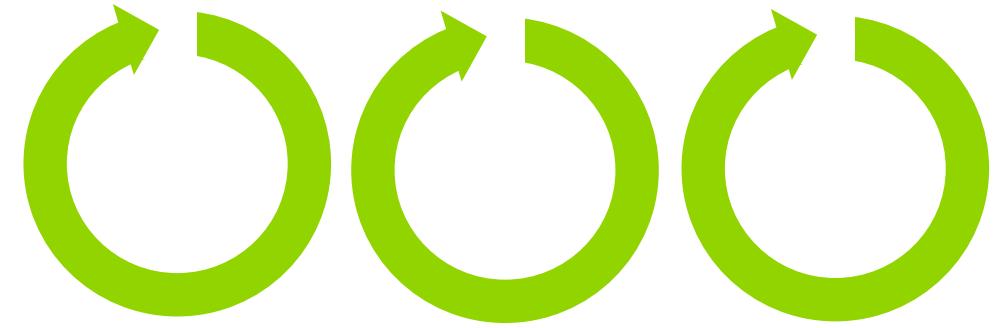
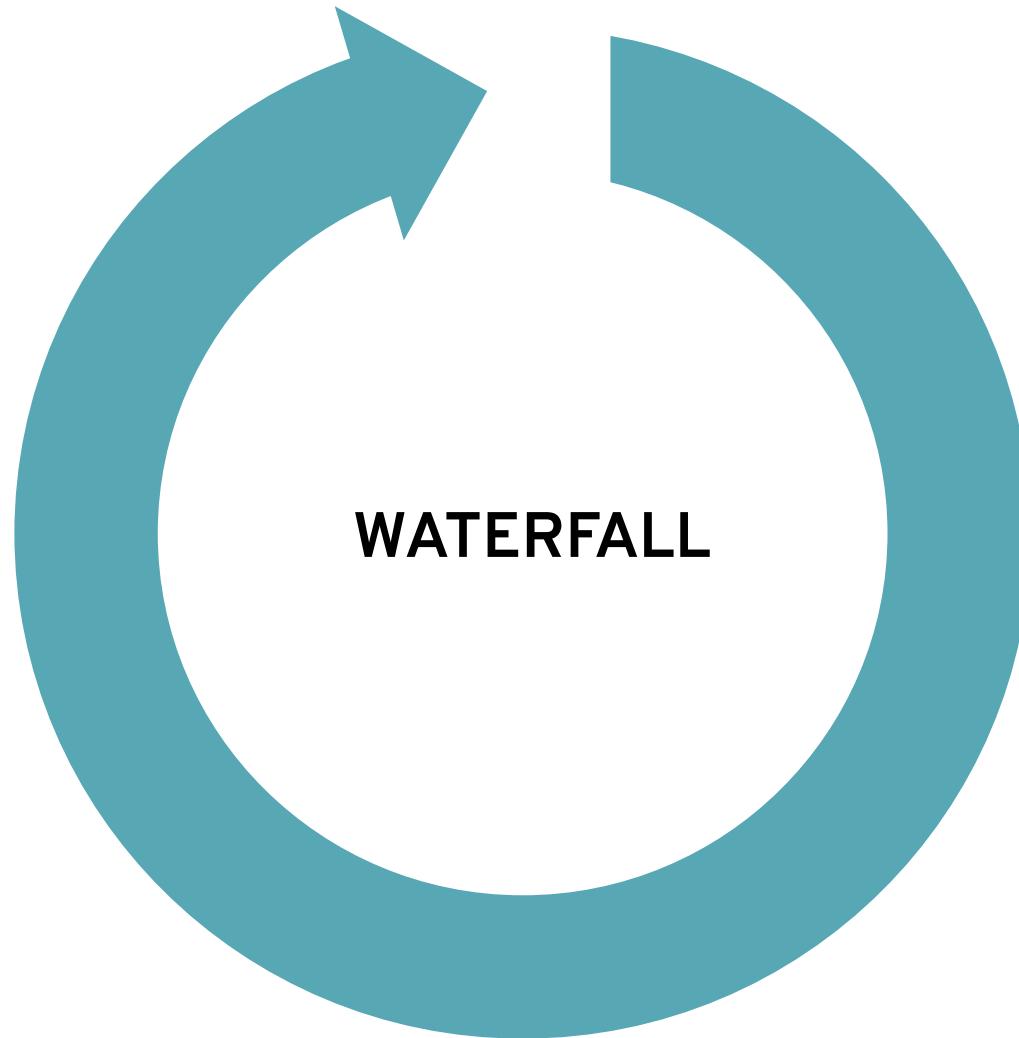
- Shipyard (blue hexagon)
- Sailboat (blue sailboat)
- Flame (red flame)
- Lightning bolt (red lightning bolt)
- Ceph (red circle with a white ring)
- CoreOS (blue circle with a white triangle)
- etcd (blue hexagon with a gear icon)
- Snowflake (blue hexagon with a snowflake icon)

The bottom section is a dark teal bar with the text "Open source innovation".

Red Hat Middleware

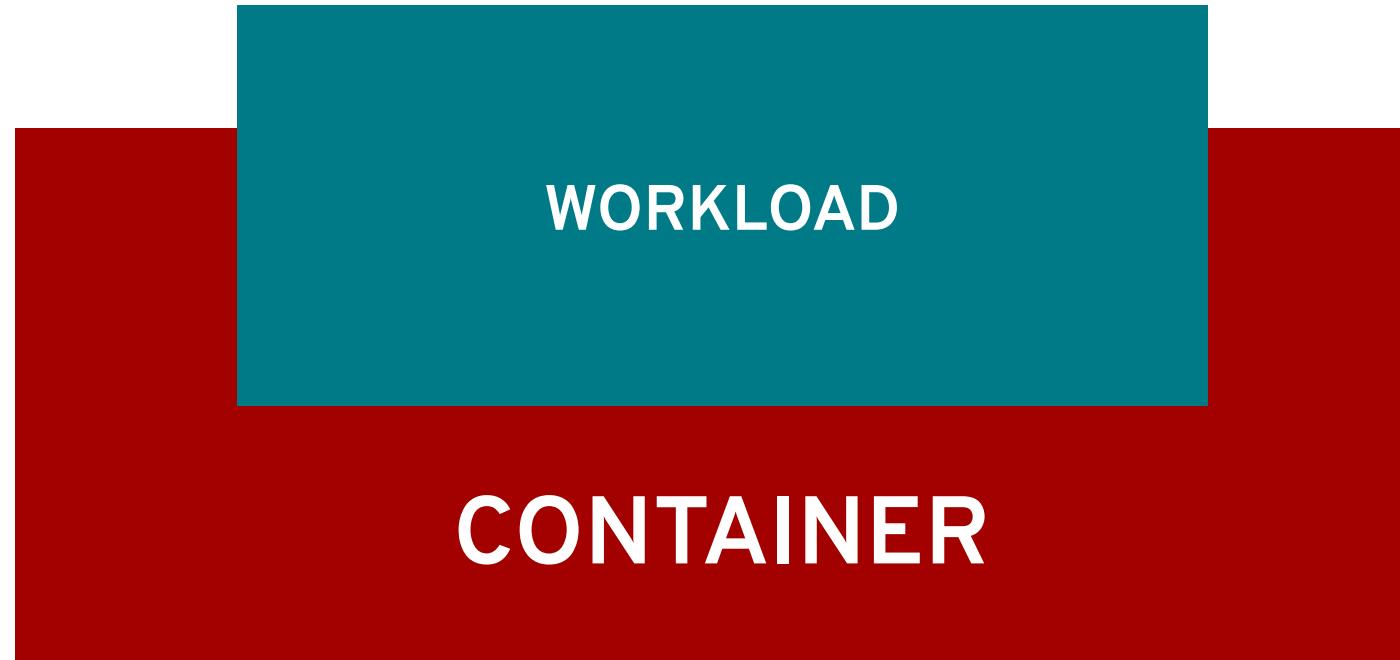
Capabilities to support cloud-native application environments



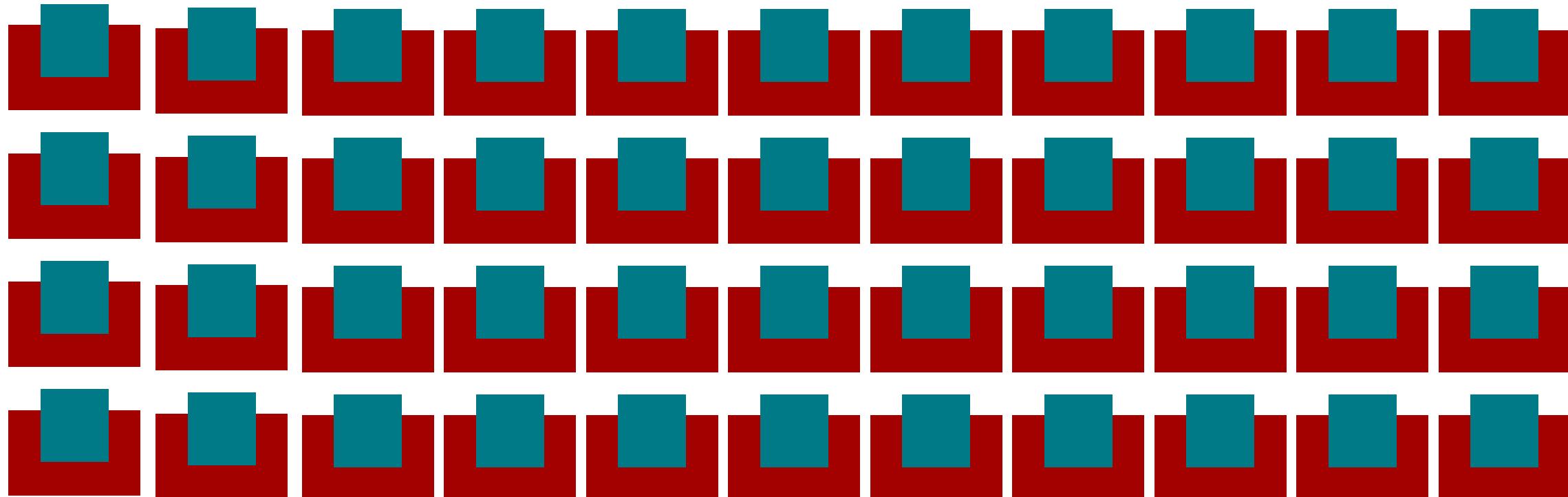


**AGILE,
INCREMENTAL,
ITERATIVE**

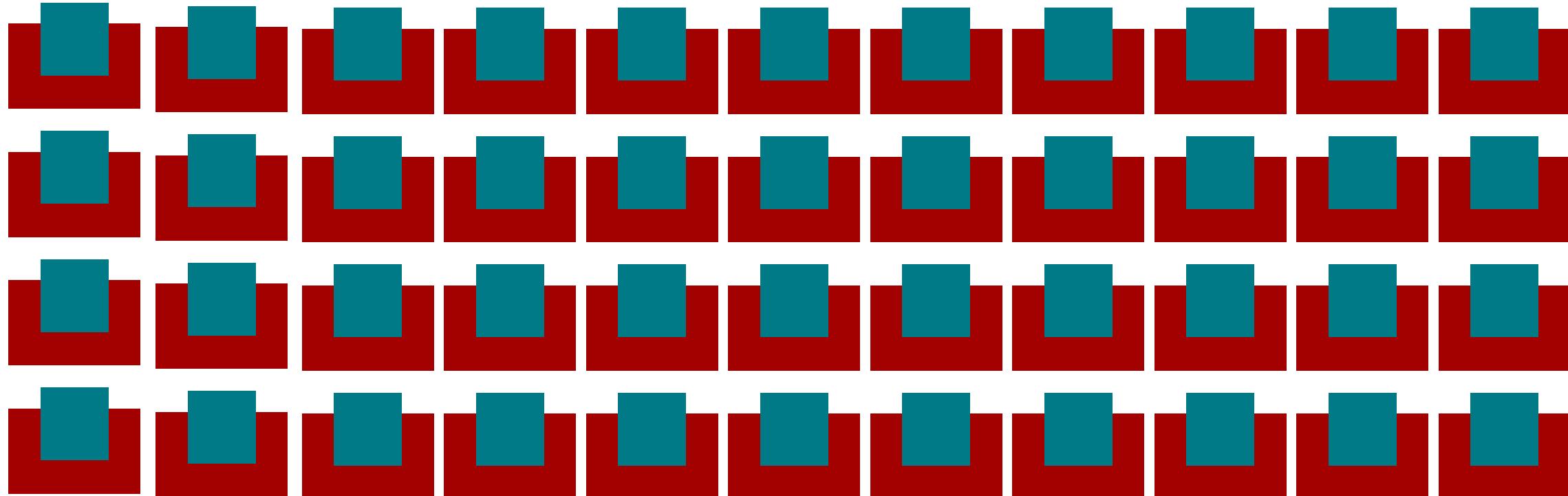
KEY TO INCREMENTAL: THE CONTAINER



DOING CONTAINERS AT SCALE IS HARD

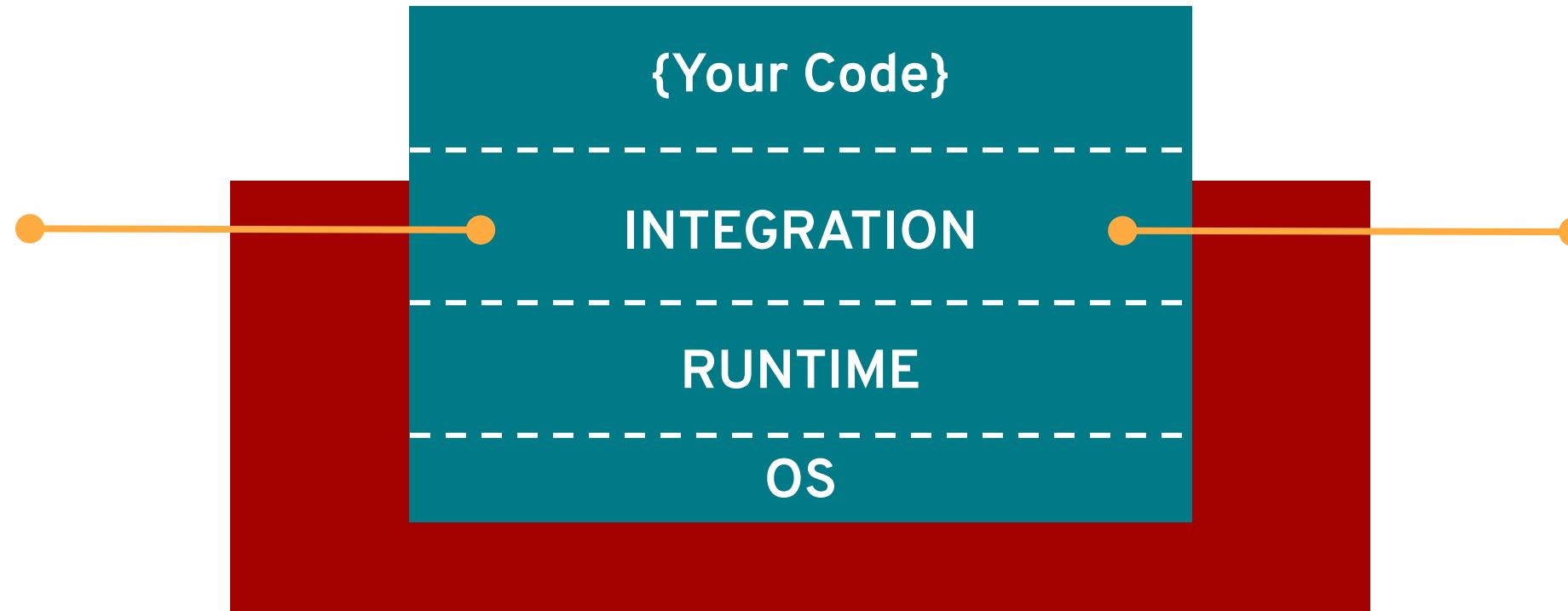


WHAT THE CONTAINER IS ON MATTERS



PLATFORM

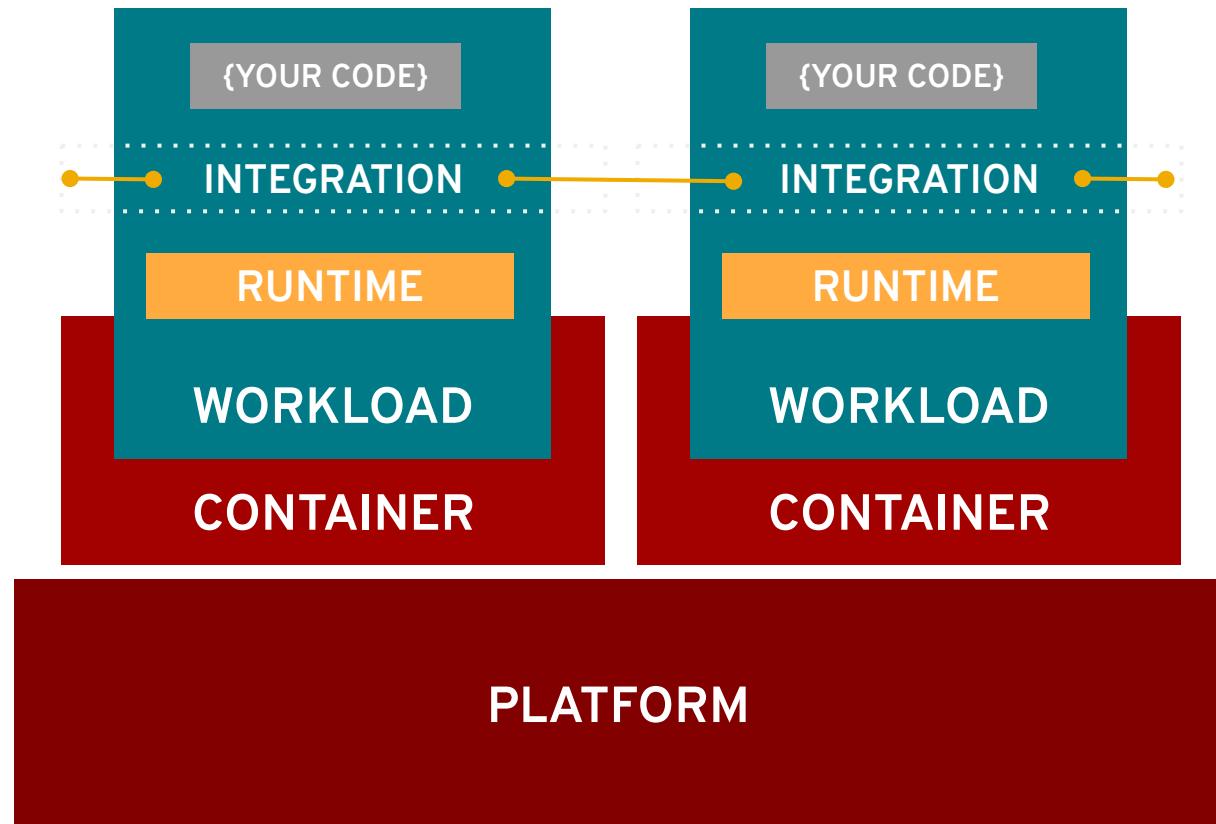
What's IN the Container Matters



WHAT'S BETWEEN THE CONTAINERS MATTERS

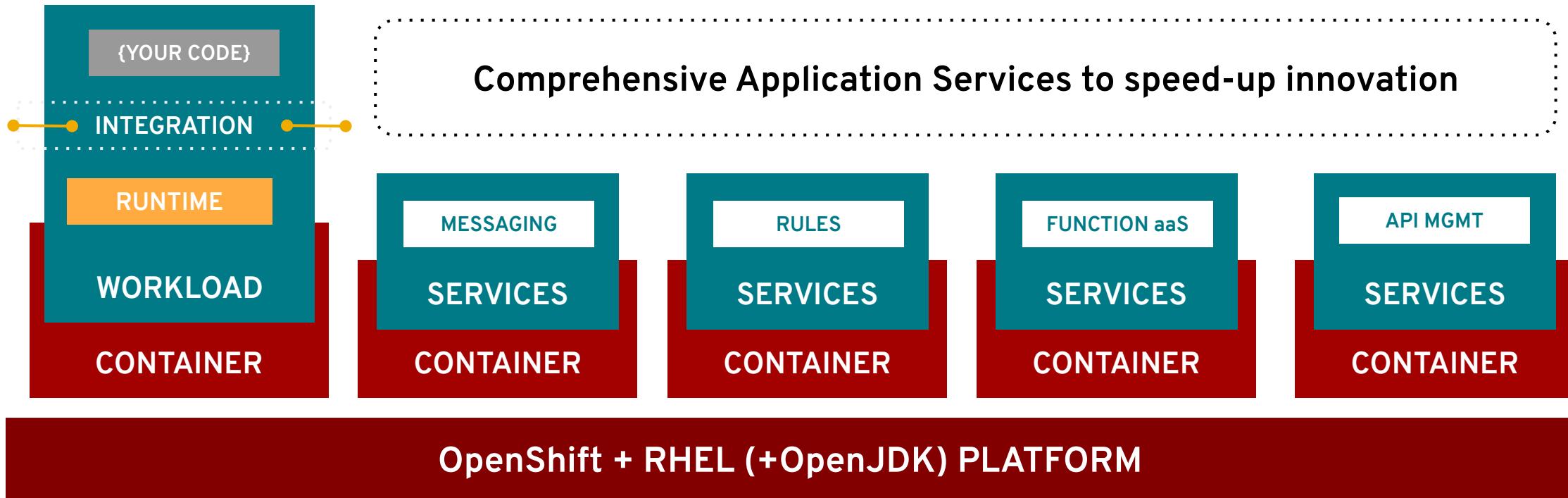
Integrate data, processes and policies across microservices, applications and systems

- Integrate more data sources
- Create, expose and manage APIs
- Reuse integration patterns
- Control and monetize APIs
- Extract and transform data

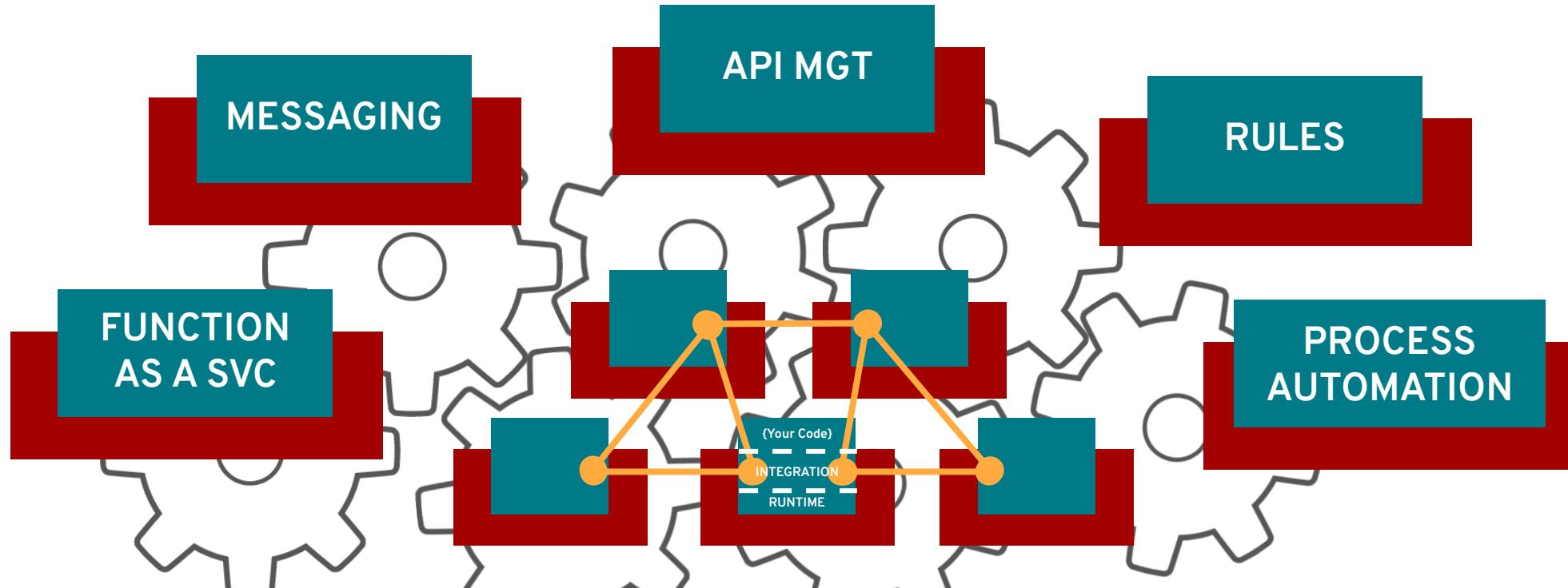


WHAT'S AROUND THE CONTAINERS MATTER

Supporting your applications thru a comprehensive application environment



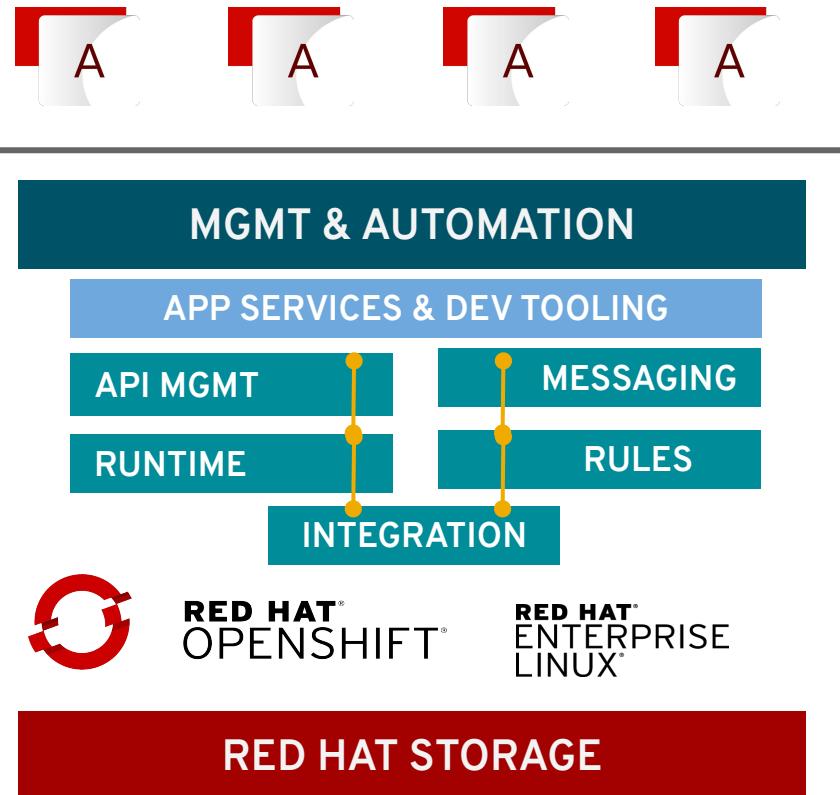
HOW IT'S ALL ENGINEERED TOGETHER MATTERS



WHY RED HAT MIDDLEWARE FOR HYBRID CLOUD?

A unified application environment.

For a faster, flexible cloud-native future



Distributed applications demand more complete and open platforms for innovation – where the connective tissue between applications, data, and users remains strong as needs shift, move, and scale

RED HAT MIDDLEWARE

SUPPORTING CLOUD NATIVE WORKLOADS

APPLICATION RUNTIMES



RED HAT® DATA GRID

RED HAT JBOSS®
ENTERPRISE
APPLICATION PLATFORM
OpenJDK

**RED HAT®
AMQ BROKER**

INTEGRATION

**RED HAT®
FUSE**

**RED HAT®
AMQ**

**RED HAT® 3SCALE
API MANAGEMENT**

PROCESS AUTOMATION

**RED HAT®
PROCESS AUTOMATION
MANAGER**

**RED HAT®
DECISION
MANAGER**

CORE TOOLS TO BUILD CLOUD
NATIVE & MIGRATE EXISTING APPS

COMPOSE AND INTEGRATE
MICROSERVICES ACROSS AN
ENTERPRISE SERVICE NETWORK

AUTOMATE AND OPTIMIZE
BUSINESS PROCESSES

Develop, deploy, and manage across cloud and on-premise

Integration with Red Hat Developer, CI/CD tools, & security services

Optimized for Red Hat OpenShift & Kubernetes services

Support organizations desire for choice and process standardization

Emphasis on solution

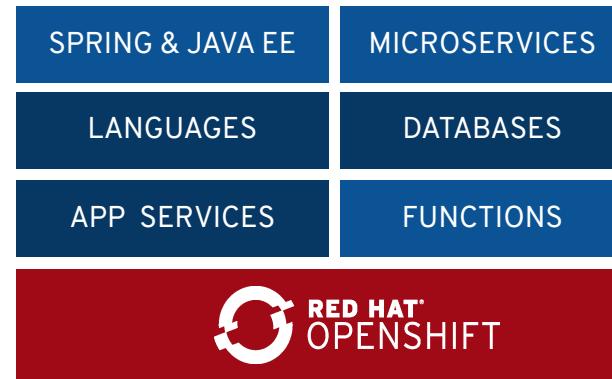
Simplified selling motion

Flexible consumption



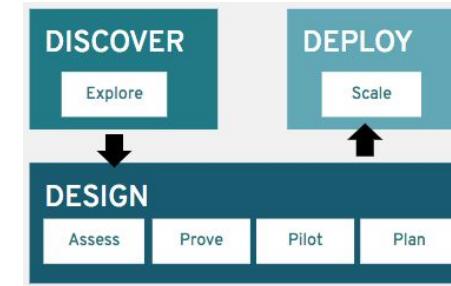
MIDDLEWARE ON OPENSHIFT

Why is **Red Hat** the best choice for cloud-native applications?



Standardize on a set of best-of-breed open source runtimes and frameworks

Simplify development thru native integration with OpenShift and Kubernetes Services



Support modernization initiatives at any speed with lift and shift, replatform and refactor



Match application requirements to polyglot runtime/framework (“right tool for the right job”)

Red Hat Developer Tools

Tools and standard processes to increase developer productivity on Kubernetes



OPENSHIFT DEVELOPER SERVICES

IDE

Eclipse Che, VSCode, IntelliJ and Eclipse IDE provide web-based and desktop IDEs integrated with OpenShift and Kubernetes

DEV CONSOLE

Developer and application-centric web console for interacting with OpenShift

DEV CLI

Developer CLI to provide an application-centric way of interacting with OpenShift

BUILDS

Automated and secure image builds from application source code, binary or Dockerfile

CI/CD

Continuous delivery pipelines optimized for Kubernetes (via the Tekton project)

Enabling developer productivity to build and deploy apps on Kubernetes

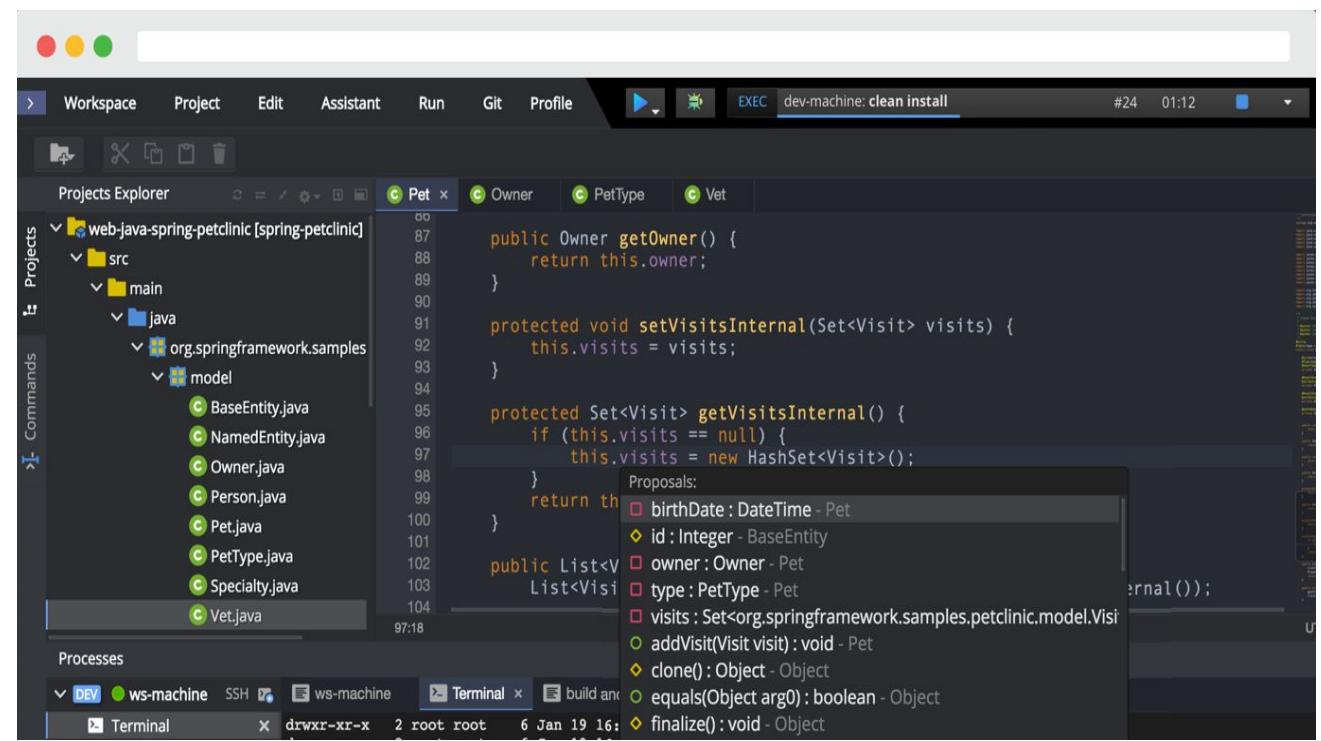
The Red Hat CodeReady Portfolio

A Sub-Brand for Developers

- Red Hat CodeReady **Workspaces** (supported Eclipse Che)
- Red Hat CodeReady **Containers** (local laptop install of OpenShift 4)
- Red Hat CodeReady **Studio** (Desktop Eclipse)
- Red Hat CodeReady **Builder** (tools for building on RHEL)

Red Hat CodeReady Workspaces

- Browser-based web IDE and dev environment in Kube pods
- Red Hat supported Eclipse Che
- Bundled with OCP/OSD SKU
- Available on OCP and OSD
- Enabled via an operator
- Stacks based on Red Hat Linux and Middleware
- Replaces VDI



<https://www.youtube.com/watch?v=VwKEVeDy9TA>

OpenShift Pipelines CI/CD Platform

Provides a next-gen Kubernetes CI/CD pipeline that works for containers (including serverless).

Based on the Tekton project (which was spun out of the Knative Pipelines project) started by Google, Red Hat and others.

The screenshot shows the Red Hat OpenShift Pipelines interface. At the top, there's a navigation bar with the Red Hat OpenShift logo, a search bar labeled 'XYZ Name', and a dropdown for 'Project: Default'. On the right, there are buttons for 'Administrator', 'Add', and other user options. Below the navigation is a toolbar with filters: 'All' (2), 'Pending' (0), 'Running' (0), 'Complete' (0), 'Failed' (0), 'Error' (0), 'Cancelled' (0), 'Select All Filters', and '2 Items'. The main area is titled 'Builds' and shows a table for a pipeline named 'aa-build-3'. The table columns are 'NAME', 'STATUS', 'STARTED', 'DURATION', and 'TRIGGER'. The pipeline status is 'Running', started 10 mins ago, with a duration of 2 min 04 sec, triggered by 'Commit #123456ABC'. Below the table, the pipeline's step graph is displayed, showing a sequence of steps: input info → build-name (30s) → Test-st. (6s) → Code a... (13s) → Security... (20s) → Steps - (1/3) → Steps - (2/5) → Steps - (3/8) → Steps - (3/3) → Image b... (0s) → DeployTo... (0s). A tooltip for the 'build-name' step shows the command: 'Downloading six-1.11.0-py2.py3-none-any.whl Building wheels for collected packages: tornado, configparser Running setup.py bdist_wheel for tornado: started Running setup.py bdist_wheel for tornado: finished with status 'done' Stored in directory: /root/.cache/pip/wheels/0c/21/02/8cd6a381450df92b449ea7c57be653dd7aa80ba42c716212c Running setup.py bdist_wheel for configparser: started Running setup.py bdist_wheel for configparser: finished with status 'done' Stored in directory: /root/.cache/pip/wheels/1c/bd/b4/27af3f6c40645661b4cd1c21df26aca0f2e1e9714a1d4cda8 Successfully built tornado configparser Installing collected packages: six, singledispatch, certifi, backports-abc, tornado, enum34, configparser, mccabe, pyflakes, pycodestyle, flake8 Found existing installation: six 1.8.0 Uninstalling six-1.8.0: Successfully uninstalled six-1.8.0 Successfully installed backports-abc-0.5 certifi-2017.11.5 configparser-3.5.0 enum34-1.1.6 flake8-3.5.0 mccabe-0.6.1 pycodestyle-2.3.1 pyflakes-1.6.0 singledispatch-3.4.0.3 six-1.11.0 tornado-4.5.3 \$ python -c 'print("Hello, world")' Hello, world Job succeeded

Use It To: Create a Kubernetes-native CI/CD pipeline in OpenShift.

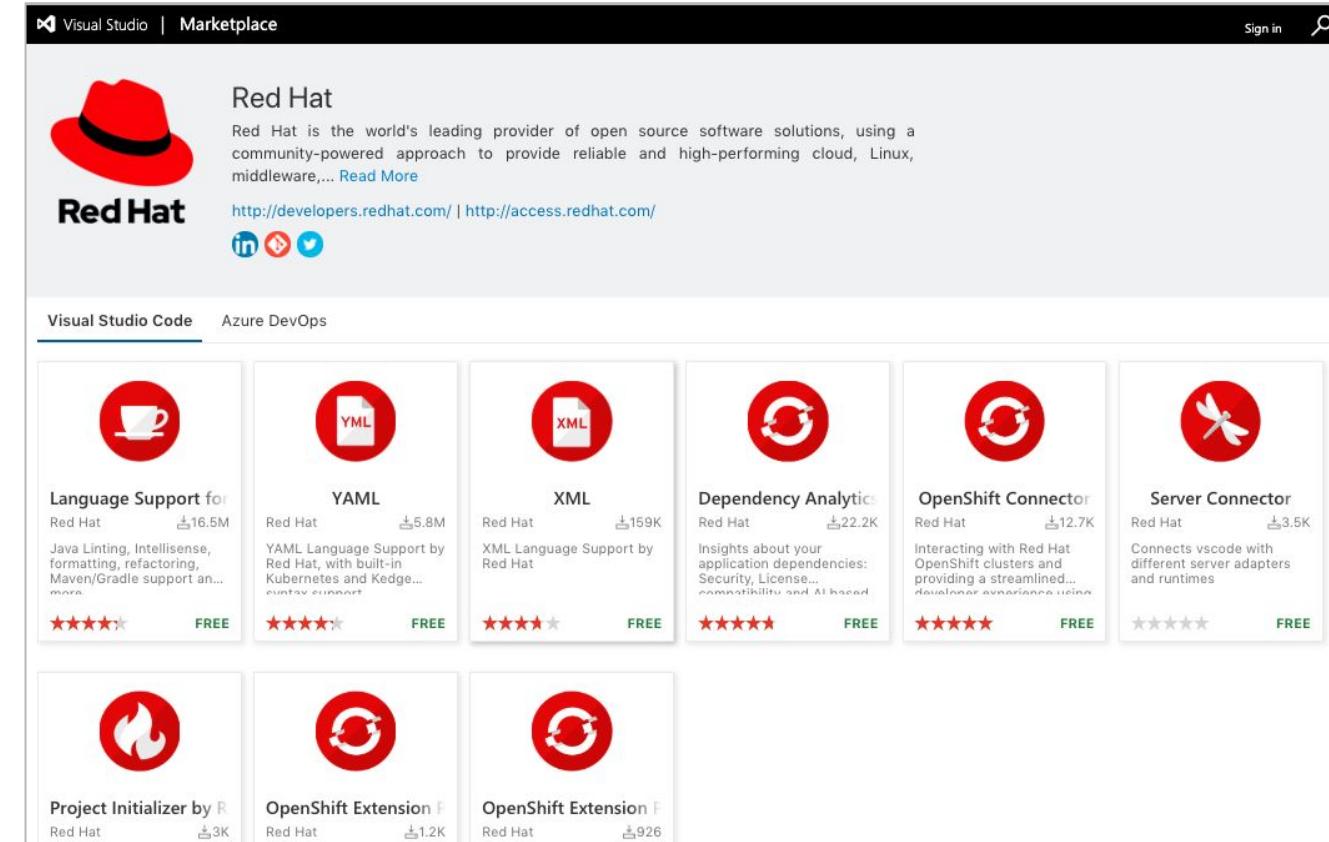


Red Hat Plugins for Microsoft VS Code

Red Hat plugins for VSCode add IDE superpowers for Java, Kubernetes YAML and XML.

The **OpenShift** plugin allows developers to quickly connect and deploy to OpenShift instances locally or remotely.

Dependency Analytics adds license and CVE package alerts.



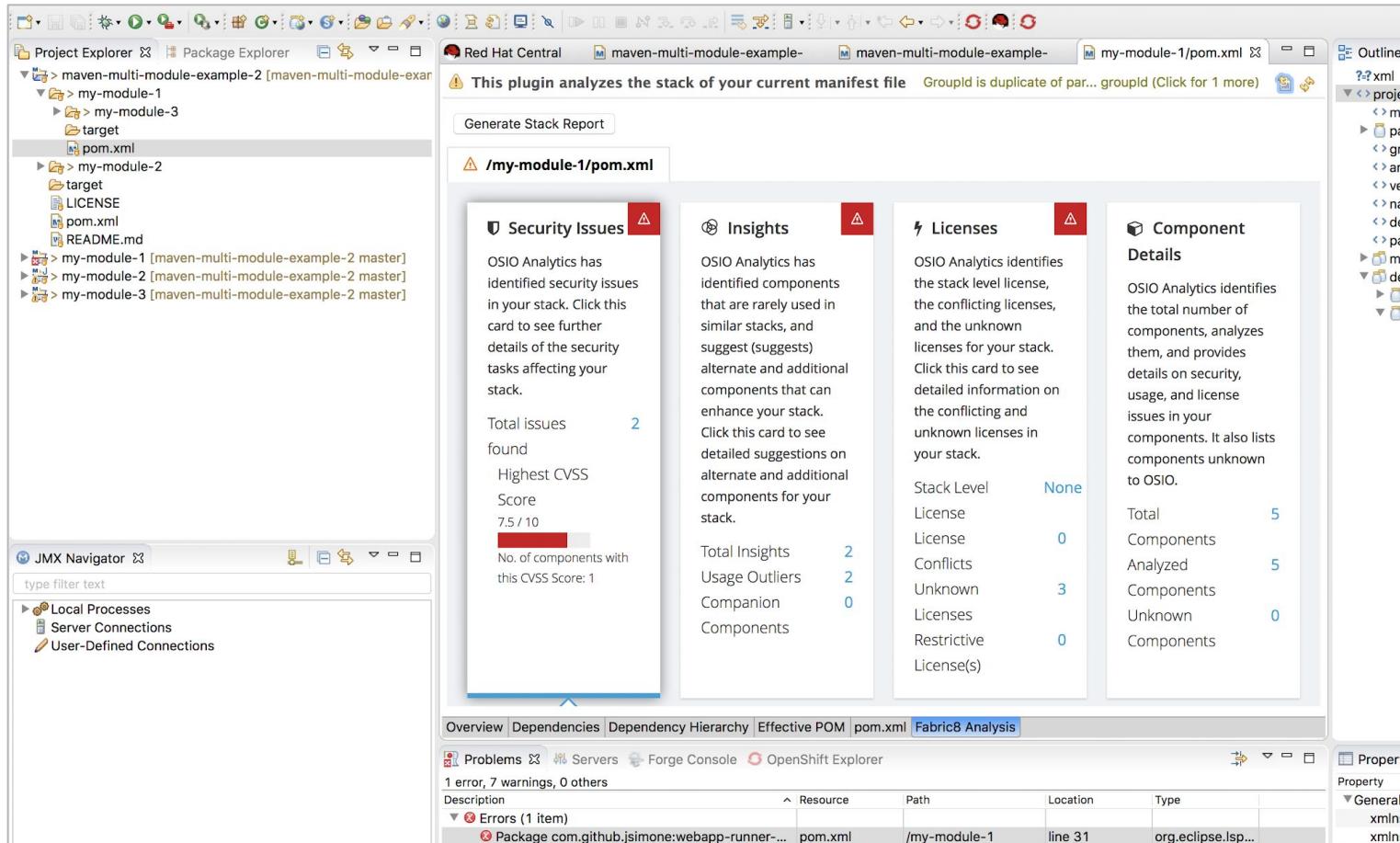
Use It To: Get the most out of Red Hat's products in the VS Code IDE.



Source Code Dependency Analytics

The dependency analytics service provides security and license warnings for any dependency in a project. This helps developers to fix problems earlier in the cycle.

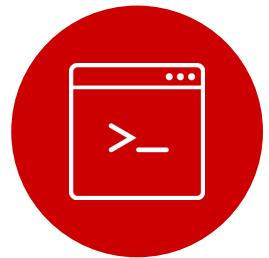
- Find CVEs in any package
- Discover license mismatches
- Supported for Java and Node



Use It To: Help developers find critical issues before they hit production.



As a Red Hat Customer You Can Benefit from the Red Hat
Developer Program and Tools Every Day.



LEVERAGE INTUITIVE
DEVELOPER TOOLS FOR
YOUR KEY PLATFORMS



RELY ON RED HAT SUPPORT
FROM DEVELOPMENT
THROUGH PRODUCTION



LEARN FROM RED HAT'S
EXPERIENCE TO INFORM
YOUR OWN DECISIONS

OpenShift Developer Console

Provide developers with an application-centric UI that enables them to quickly import code, create containers, link services and build their projects.

Will leverage OpenShift Pipelines for the CI/CD, and use Istio and Kiali project to provide a graphical view of container interactions for an application.

The screenshot shows the OpenShift Developer Console interface. On the left, a sidebar menu includes 'Topology', 'Builds', 'Advanced' (with sub-options 'Projects', 'Status', 'Events', 'Search'), and '+Add'. The main area displays a 'Topology' view for the 'default' project, showing four containers: 'node-app1' (Python icon), 'nodejs2' (Node.js icon), 'node-app2' (Python icon), and another 'node-app' (Node.js icon). Below the topology is a search bar with three icons. To the right, a detailed view for the 'nodejs2' deployment is shown. The 'Overview' tab is selected, displaying the 'DESIRED COUNT' (1 pod), 'UP-TO-DATE COUNT' (0 pods), and 'MATCHING PODS' (0 available, 0 unavailable). The 'Resources' tab is also visible. The deployment configuration details include:

| | | | |
|--------------|--|-------------------|---------------------------|
| NAME | nodejs2 | LATEST VERSION | 0 |
| NAMESPACE | NS default | UPDATE STRATEGY | Recreate |
| LABELS | app=nodejs app.kubernetes.io/instance=nodejs2 app.kubernetes.io/name=nodejs app.kubernetes.io/part-of=default-app app.kubernetes.io/version=10 deploymentconfig=nodejs2 | MIN READY SECONDS | Not Configured |
| POD SELECTOR | app=nodejs, app.kubernetes.io/instance=nodejs2, app.kubernetes.io/name=nodejs, app.kubernetes.io/part-of=default-app | TRIGGERS | ConfigChange, ImageChange |

Use It To: Share an application- and code-centric UI with your development teams.



BUILD SOFTWARE THE RED HAT WAY IN OPEN INNOVATION LABS



EXPERIMENT
Rapidly build prototypes,
do DevOps, and be agile.

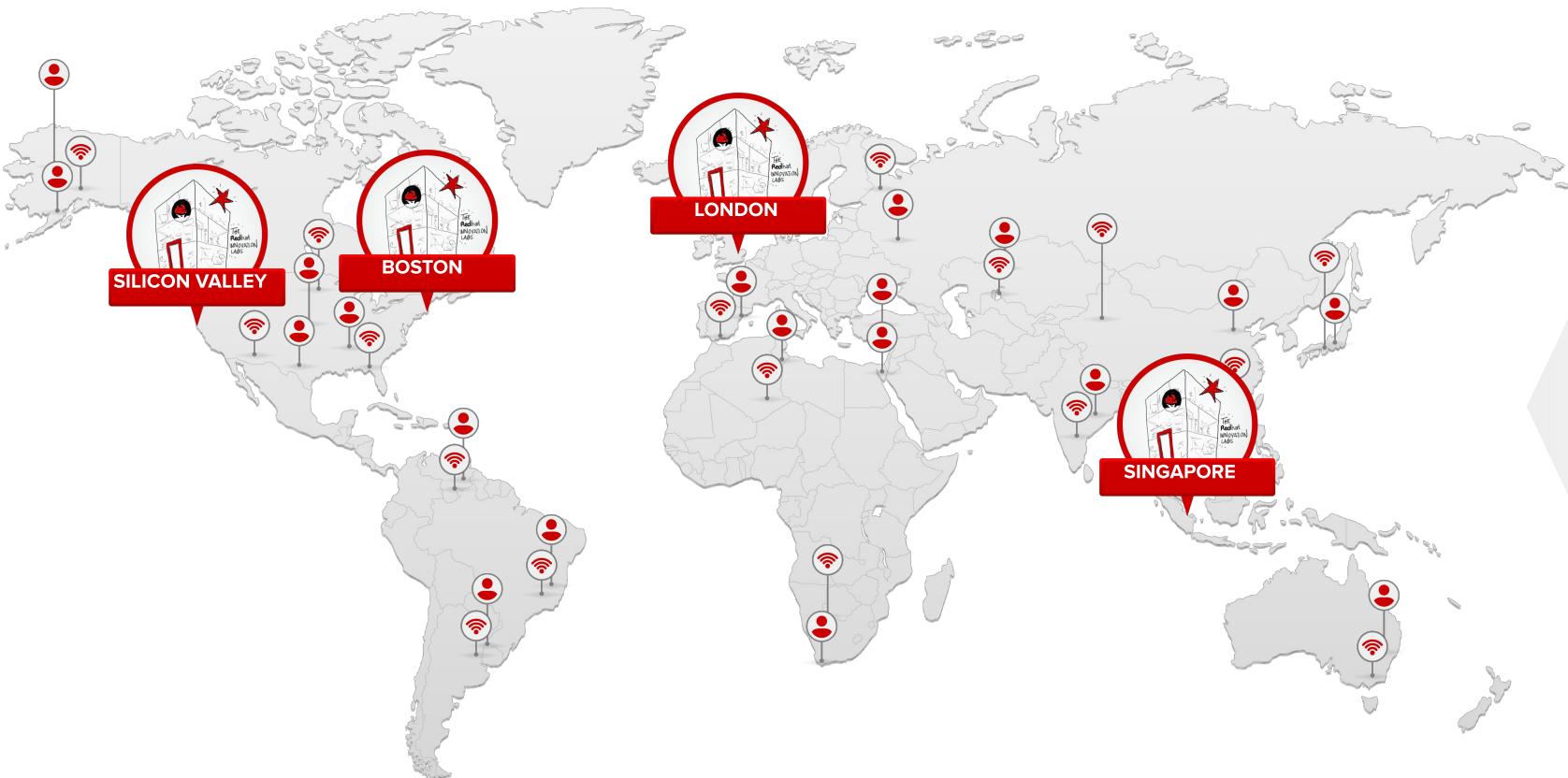


IMMERSE YOUR TEAM
Work side-by-side with experts
in a residency-style engagement.



CATALYZE INNOVATION
Bring modern application
development back to your
team.

DRIVE A CULTURE OF INNOVATION THROUGH A SPACE THAT FOSTERS COLLABORATION

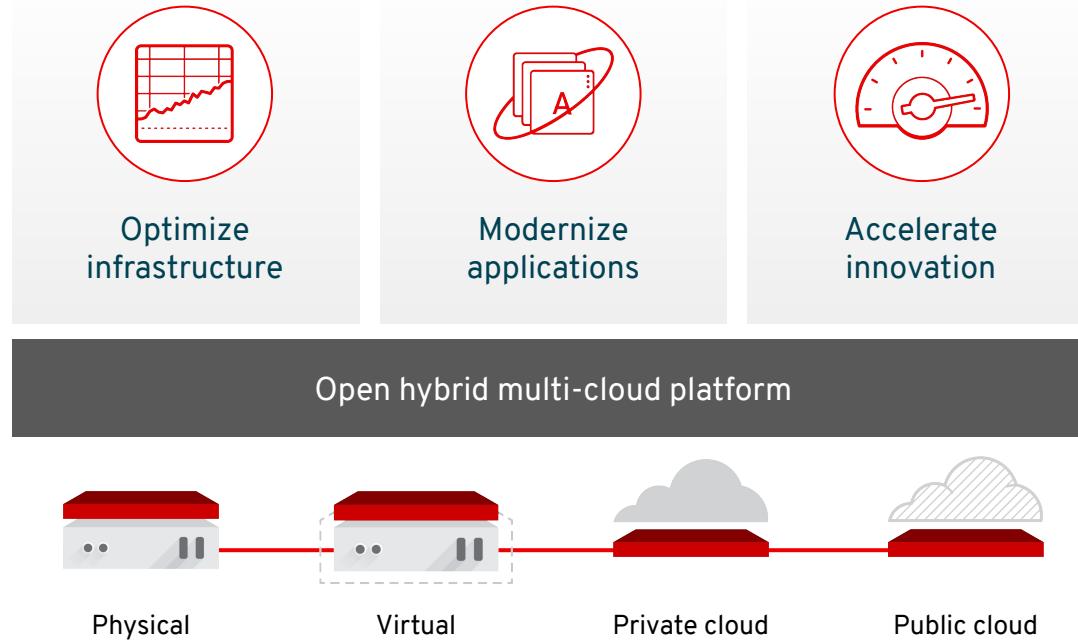


INNOVATE ANYWHERE

- Purpose-driven
- Collaborate and make
- Network and share
- Flex and adapt
- Rejuvenate and connect

Red Hat modernization and migration solutions

Innovation labs | Analytics service | Migration tooling | Open practice library



Establish platforms for the future

Accelerate adoption of next generation technologies

Reduce cost of existing applications and infrastructure

Transform development and operations practices and culture

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.



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