OpenShift Enterprise

Open Source PaaS Cloud

Adam Miller
OpenShift Online Release Engineer

OPENSHIFT by redhat.

Cloud Service Models

IaaS   **PaaS**   **SaaS**

APPLICATION

APPLICATION PLATFORM
(JBOSS, PHP, RUBY, ETC)

OPERATING SYSTEM
(RHEL)

VIRTUALIZATION
(RHEV)

HARDWARE
(x86)

STORAGE
(RHS)
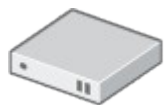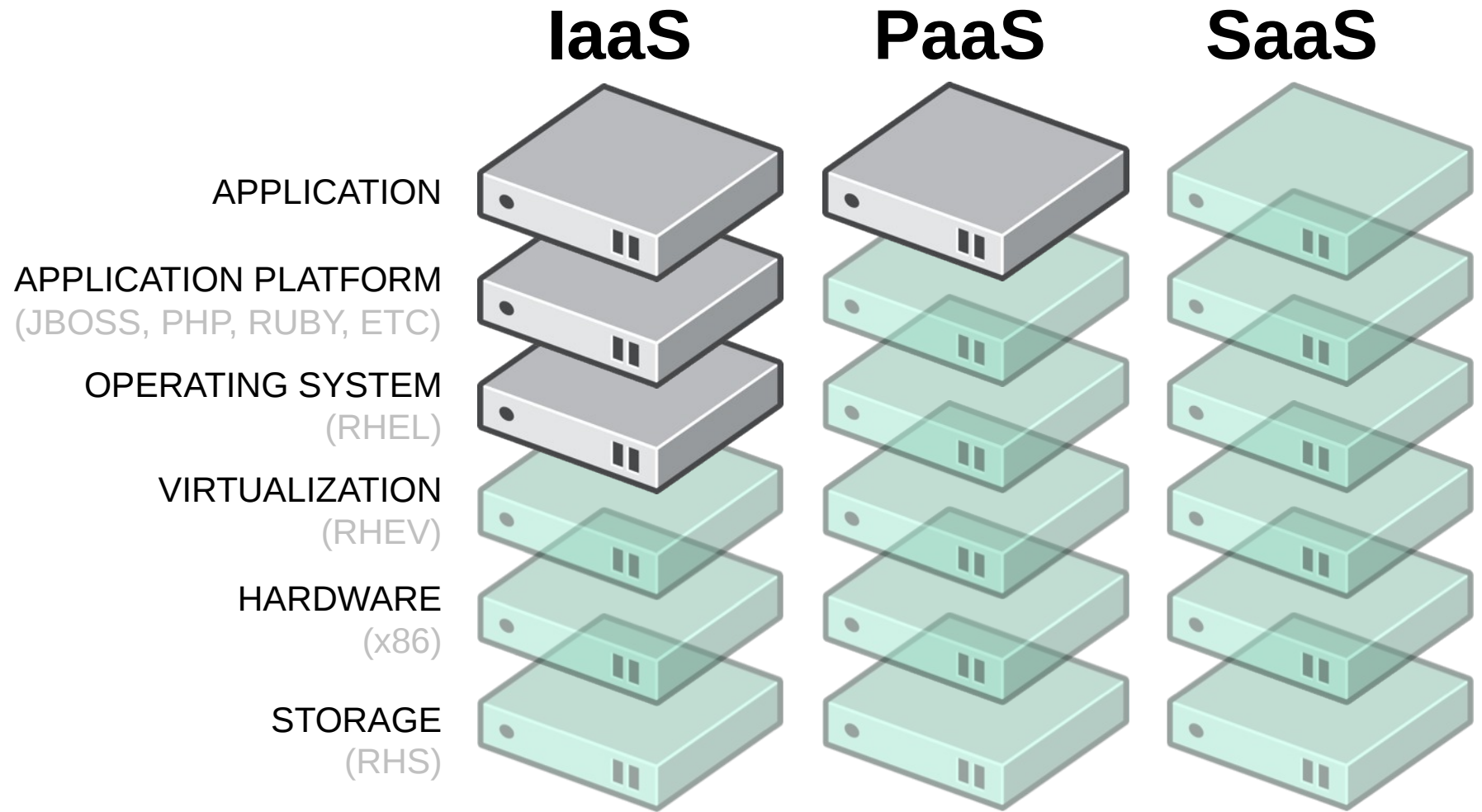
Managed and Controlled by Customer (IT, Dev, or User)

Automated and Managed by the Public or Private Cloud Offering

Increased Control

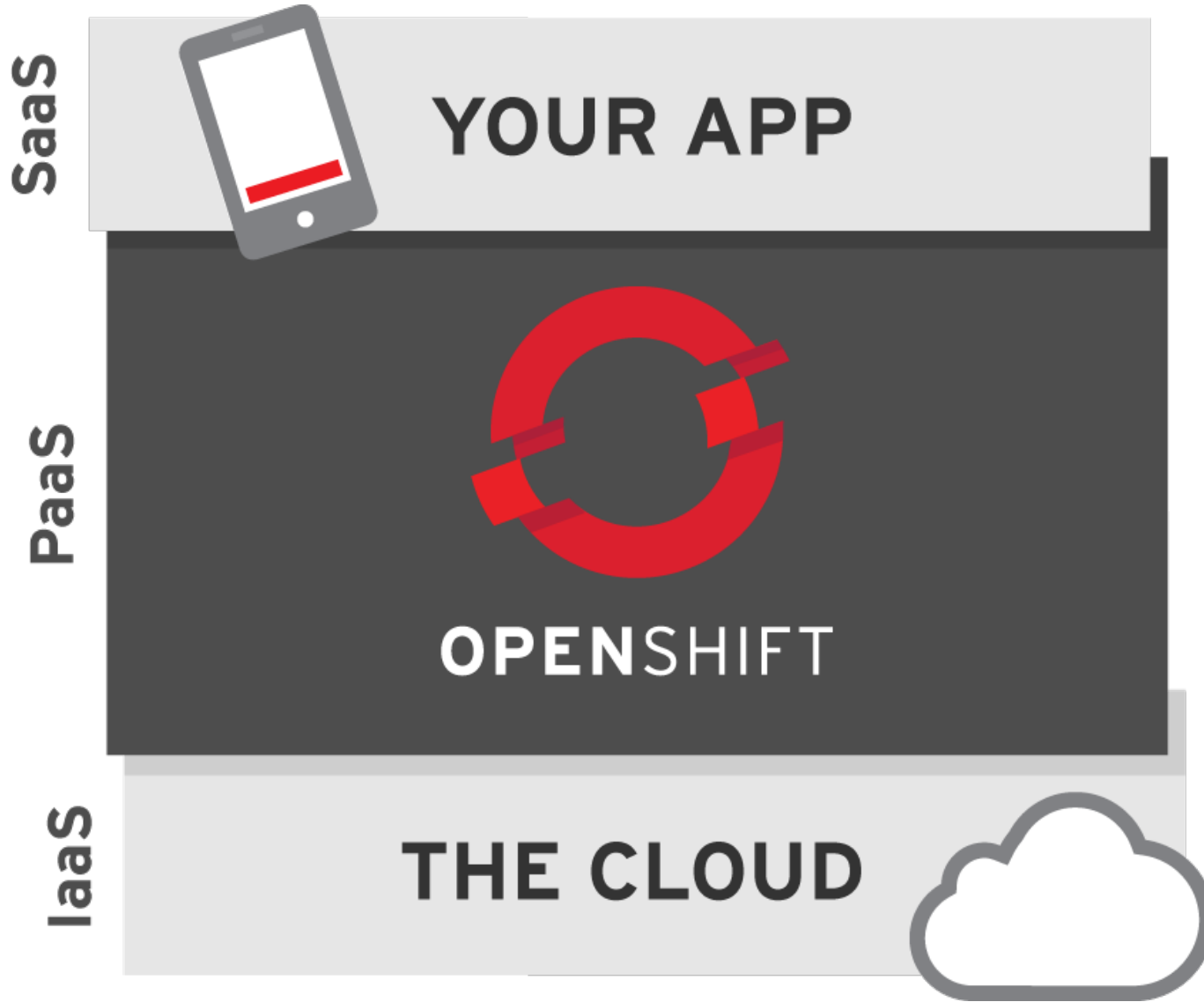Increased Automation

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PaaS = Platform as a Service

A Cloud Application Platform

Code   Deploy   Done

Code your app

Push-button Deploy, and your App is running in the Cloud!

LAUNCH

Save Time and Money

OPENSHIFT by redhat.

SaaS — YOUR APP

PaaS — OPENSHIFT

IaaS — THE CLOUD

OPENSHIFT by redhat.
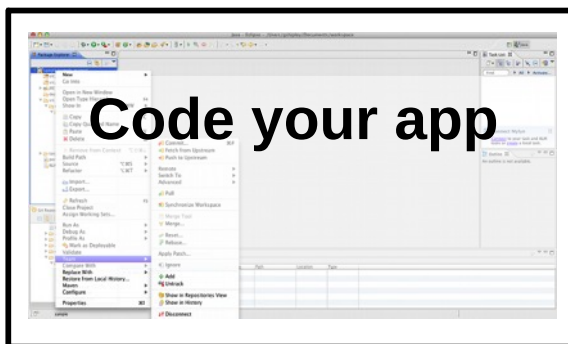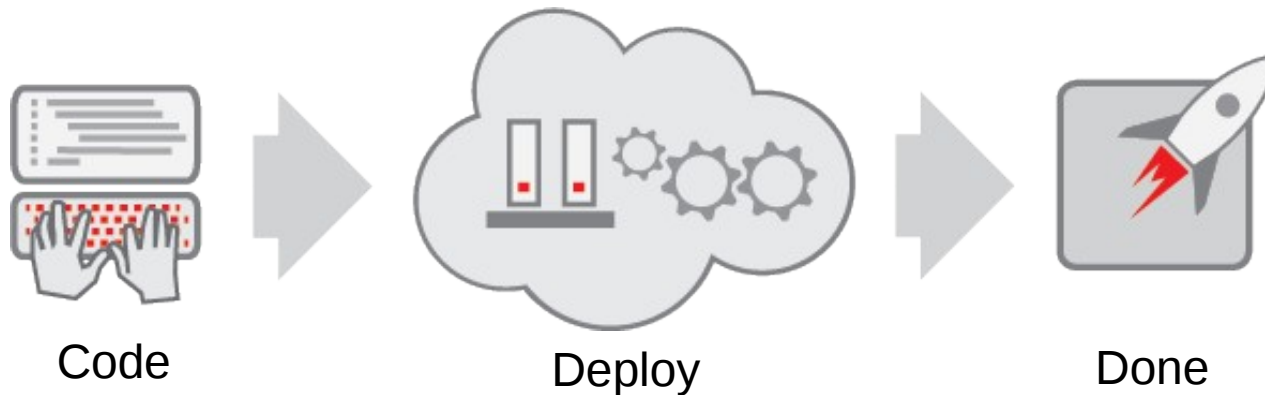
Streamlining App Dev with PaaS

Craftwork

Assembly Line

| Physical | Virtualized | With PaaS |

How to Build an App:
1. Have Idea
2. Get Budget
3. Submit hardware acquisition request
4. Wait
5. Get Hardware
6. Rack and Stack Hardware
7. Install Operating System
8. Install Operating System Patches/Fix-Packs
9. Create user Accounts
10. Deploy framework/appserver
11. Deploy testing tools
12. Test testing tools
13. Code
14. Configure Prod servers (and buy them if needed)
15. Push to Prod
16. Launch
17. Order more servers to meet demand
18. Wait…
19. Deploy new servers
20. Etc.

How to Build an App:
1. Have Idea
2. Get Budget
3. Submit VM Request request
4. Wait
5. Deploy framework/appserver
6. Deploy testing tools
7. Test testing tools
8. Code
9. Configure Prod VMs
10. Push to Prod
11. Launch
12. Request More Prod VMs to meet demand
13. Wait
14. Deploy app to new VMs
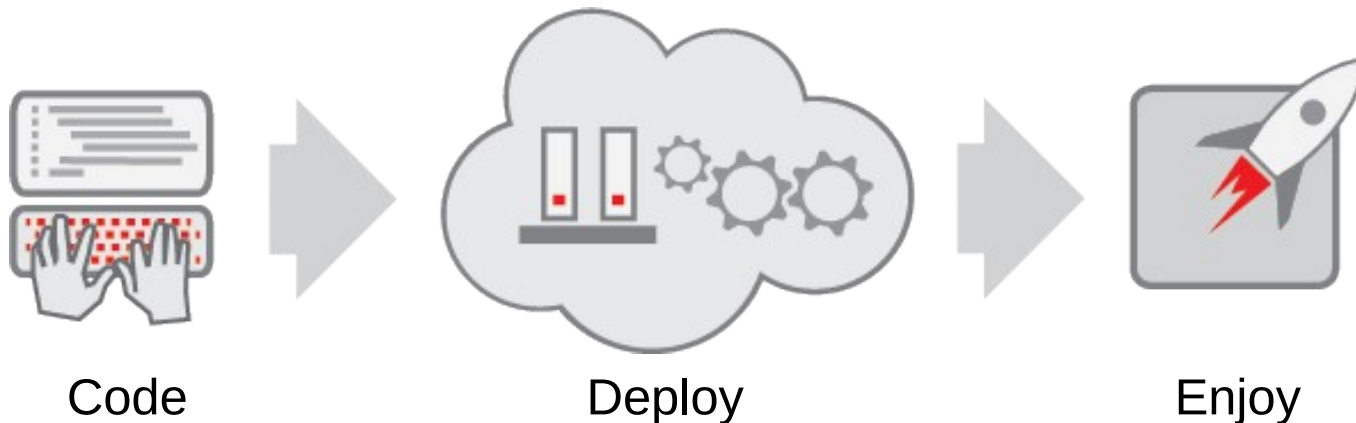15. Etc.

How to Build an App:
1. **Have Idea**
2. **Get Budget**
3. **Code**
4. **Test**
5. **Launch**
6. **Automatically Scale**

*"The use of Platform-as-a-Service technologies will enable **IT organizations** to become more agile and **more responsive to the business needs**." –Gartner**
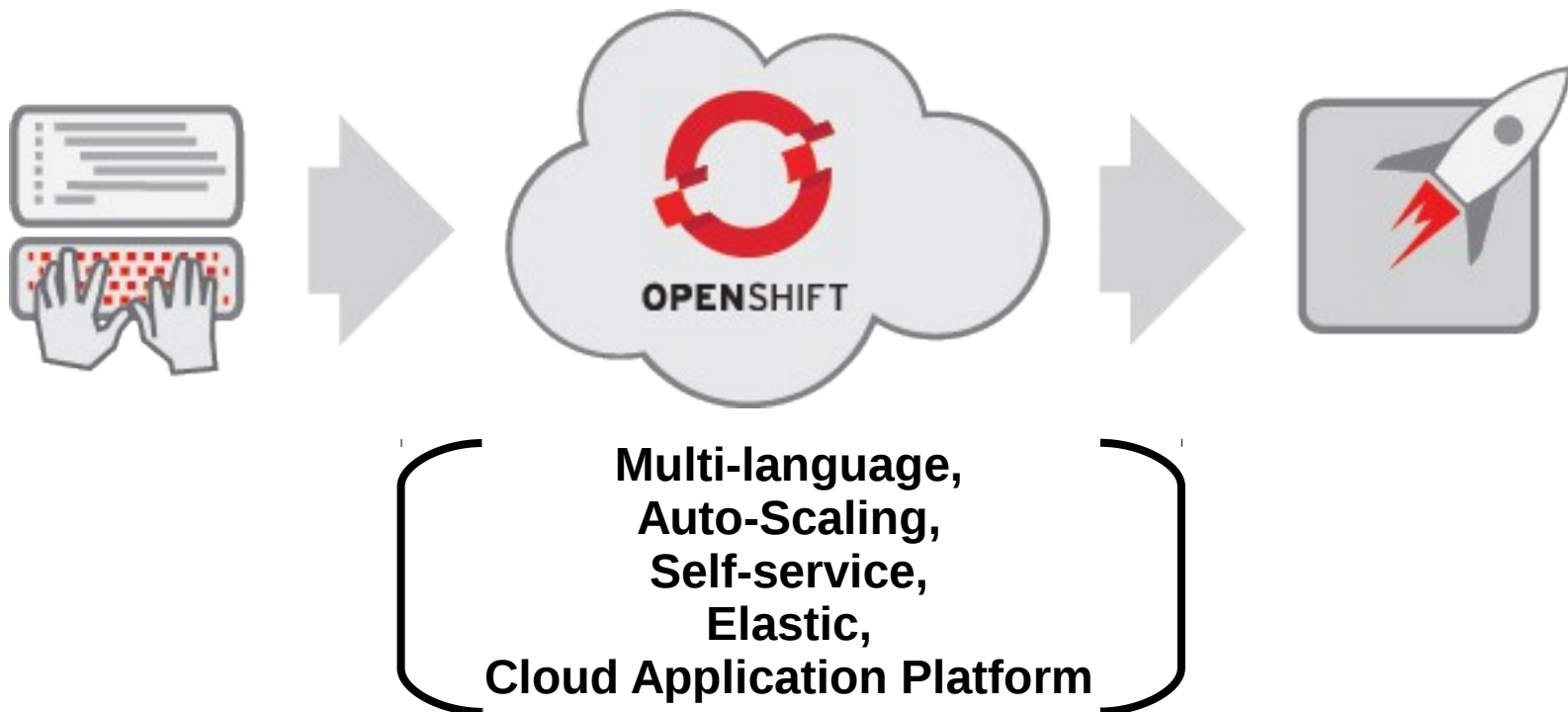
OPENSHIFT by redhat.

Accelerate IT Service Delivery

PaaS leverages **automation** technologies and a **cloud** architecture…

Code   Deploy   Enjoy

…to drive **Velocity**, **Efficiency**, and **Scalability** in **IT**

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OpenShift
is
PaaS by Red Hat

Multi-language,
Auto-Scaling,
Self-service,
Elastic,
Cloud Application Platform

OPENSHIFT by redhat.

How Can I Consume OpenShift?

Public Cloud Service (in Developer Preview)

OPENSHIFT **ONLINE**

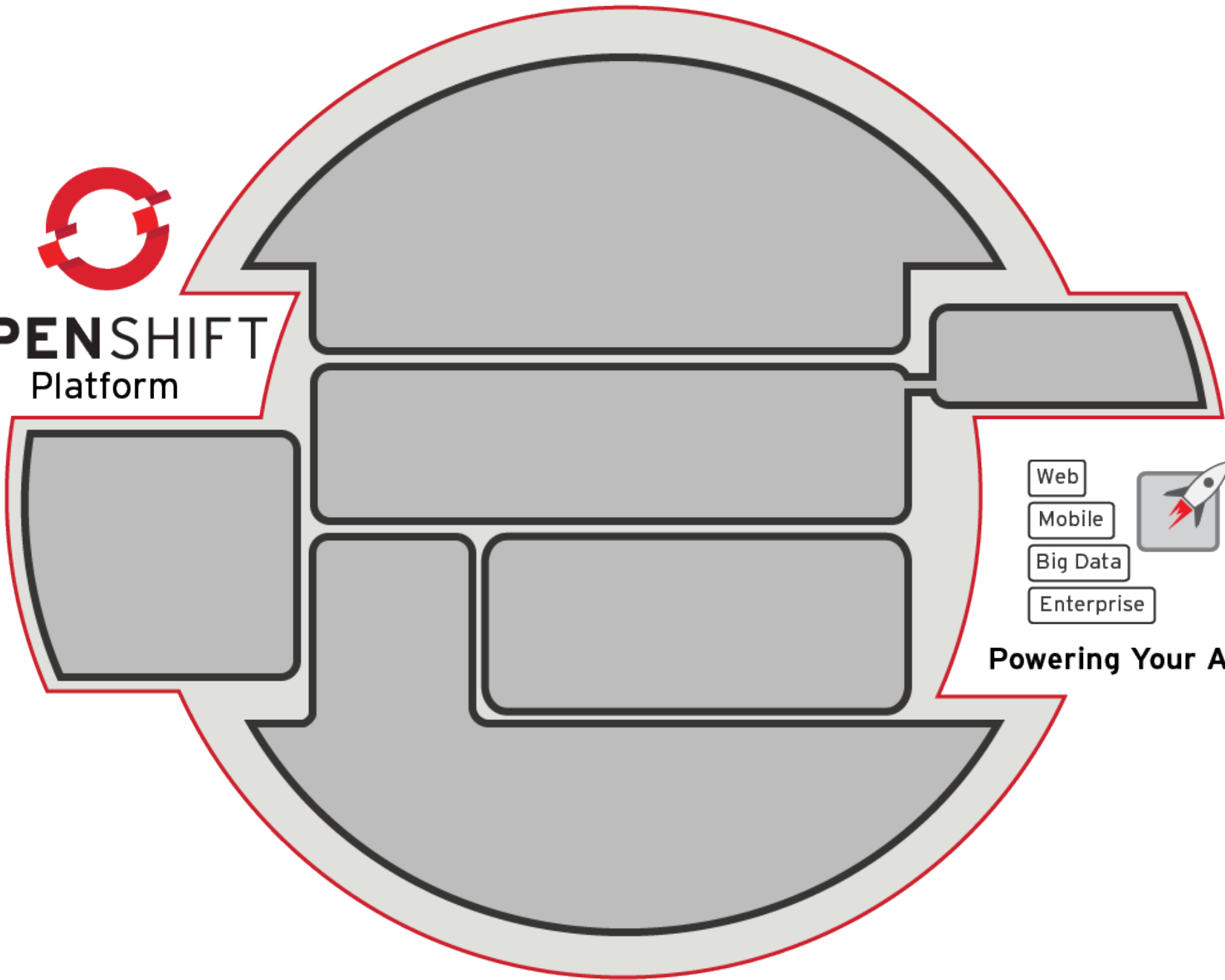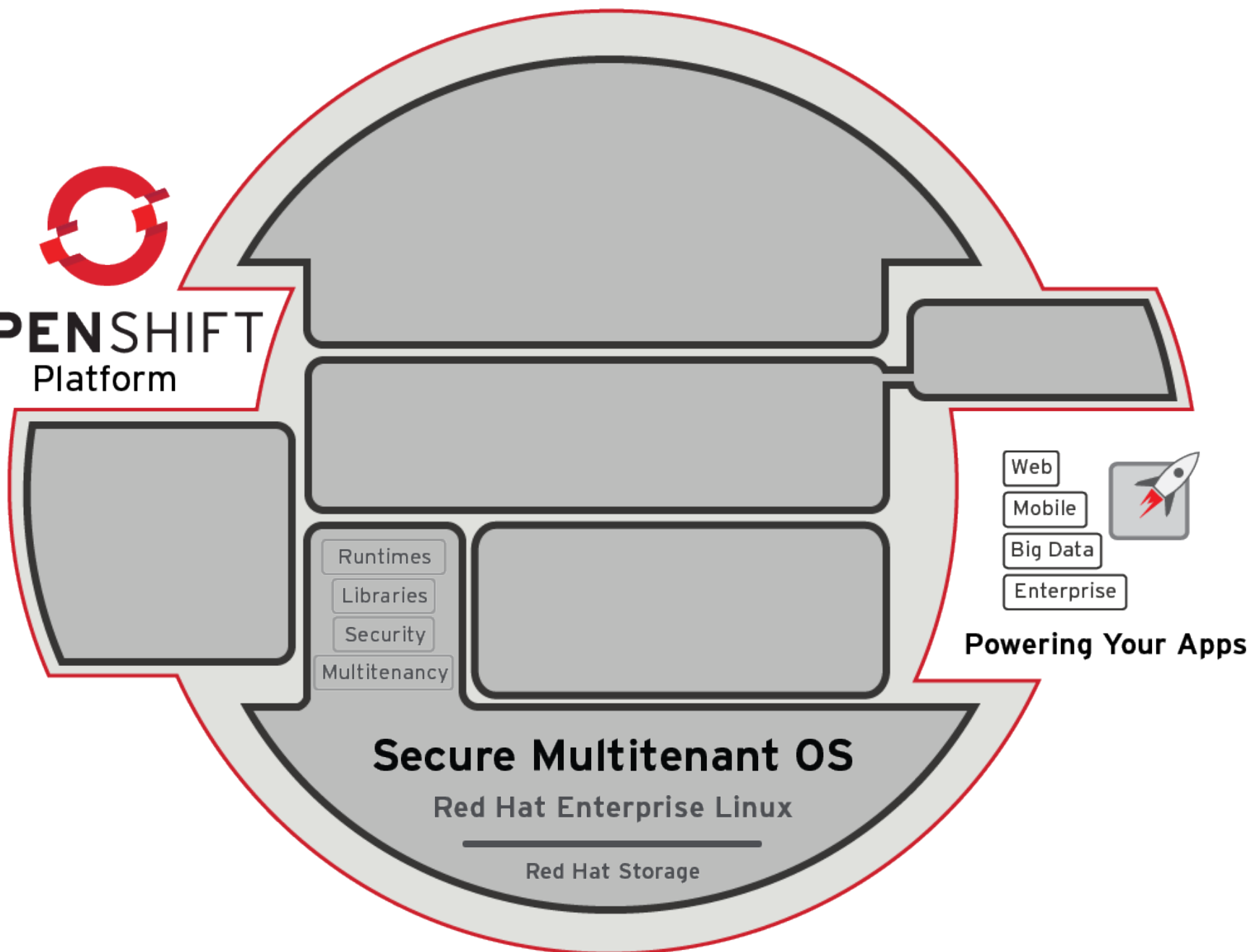On-Premise or Private Cloud Software

OPENSHIFT **ENTERPRISE**

Developer Controls

Operated by Red Hat at Scale for 18 Months

APPLICATION

APPLICATION PLATFORM
(JBOSS, PHP, RUBY, ETC)

OPERATING SYSTEM
(RHEL)

VIRTUALIZATION
(RHEV)

HARDWARE
(x86)

STORAGE
(RHS)

Developer Controls

OpenShift Automates, IT Ops Controls

IT Ops Provides

OPENSHIFT by redhat.

OPENSHIFT Platform

Web
Mobile
Big Data
Enterprise

Powering Your Apps

OPENSHIFT Platform

Runtimes
Libraries
Security
Multitenancy

Secure Multitenant OS

Red Hat Enterprise Linux

Red Hat Storage

Web
Mobile
Big Data
Enterprise

Powering Your Apps

OPENSHIFT by redhat.

OPENSHIFT Platform

Runtimes
Libraries
Security
Multitenancy

Enterprise-Class Middleware

JBoss · EE6 · Txns · CDI · Msg · +

Secure Multitenant OS

Red Hat Enterprise Linux

Red Hat Storage

Web
Mobile
Big Data
Enterprise

Powering Your Apps

OPENSHIFT
Platform

Open Source Ecosystem

Community | Partners | Red Hat
Frameworks | SQL | NoSQL | Messaging | Languages | +

Cartridge-Based
Extensibility

Runtimes
Libraries
Security
Multitenancy

Enterprise-Class
Middleware

JBoss | EE6 | Txns | CDI | Msg | +

Secure Multitenant OS

Red Hat Enterprise Linux

Red Hat Storage

Web
Mobile
Big Data
Enterprise

Powering Your Apps

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OPENSHIFT
Platform

No Lock-In Languages & Frameworks

Java | Node.js | Ruby | Python | PHP | Perl
JavaEE | Rails | django | Zend | Spring | +

Cartridge-Based Extensibility

Open Source Ecosystem

Community | Partners | Red Hat
Frameworks | SQL | NoSQL | Messaging | Languages | +

Runtimes
Libraries
Security
Multitenancy

Enterprise-Class Middleware

JBoss | EE6 | Txns | CDI | Msg | +

Web
Mobile
Big Data
Enterprise

Powering Your Apps

Secure Multitenant OS

Red Hat Enterprise Linux

Red Hat Storage

13

OPENSHIFT Platform

No Lock-In
Languages & Frameworks

Java   Node.js   Ruby   Python   PHP   Perl
JavaEE   Rails   django   Zend   Spring   +

Cartridge-Based Extensibility

Open Source Ecosystem

Community   Partners   Red Hat
Frameworks   SQL   NoSQL   Messaging   Languages   +

Dev Tools

JBoss Dev Studio
Titanium Studio
Jenkins
Maven   Git

Runtimes
Libraries
Security
Multitenancy

Enterprise-Class Middleware

JBoss   EE6   Txns   CDI   Msg   +

Web
Mobile
Big Data
Enterprise

Powering Your Apps

Secure Multitenant OS

Red Hat Enterprise Linux

Red Hat Storage

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Let's look under the hood...

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How OpenShift Works

OpenShift is a PaaS on top of... Infrastructure

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.

The Foundation of OpenShift is Red Hat Enterprise Linux

OpenShift is Built on Instances of
Red Hat Enterprise Linux (RHEL)

| RHEL | RHEL | RHEL | RHEL |

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.

An OpenShift <u>Broker</u> Manages Multiple OpenShift <u>Nodes</u>

Nodes are where User Applications live.
Brokers keep OpenShift running.

RHEL	RHEL	RHEL	RHEL
Brokers	Node	Node	Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.

Unique SELinux Approach Enables Security and Multi-tenancy

SELinux Policies securely subdivide the Node instances.

RHEL		RHEL	RHEL
Broker	Node	Node	Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.
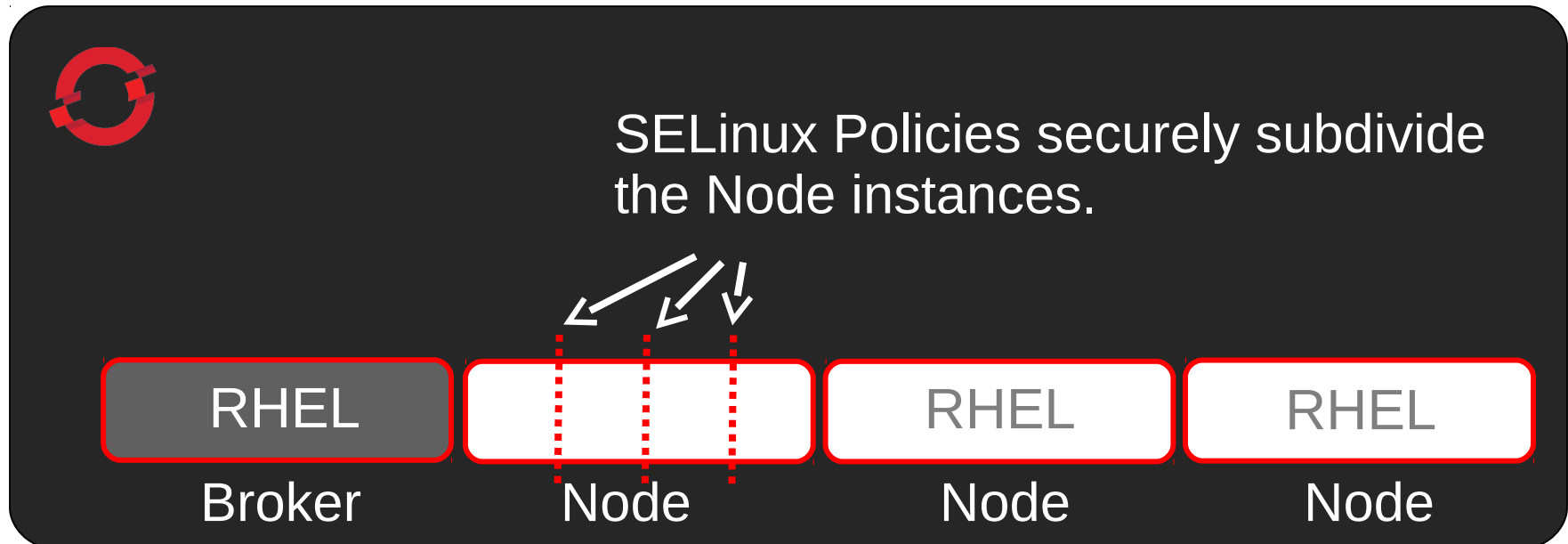
OpenShift User Applications Run in OpenShift <u>Gears</u>
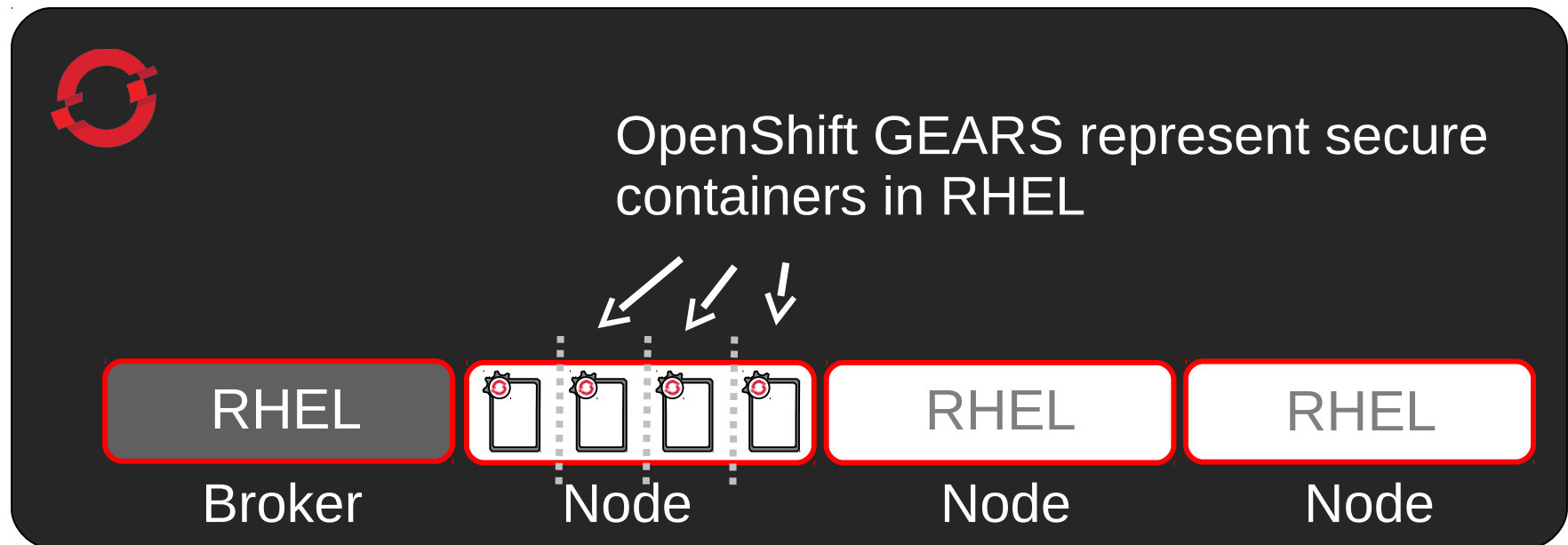
OpenShift GEARS represent secure containers in RHEL

RHEL		RHEL	RHEL
Broker	Node	Node	Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.

Developer Workflow

Web Console
Eclipse IDE
Cmd Line

OpenShift Gear

A Developer creates a new application ▯ OpenShift creates a GEAR

RHEL

Broker

Node

RHEL

Node

RHEL

Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.
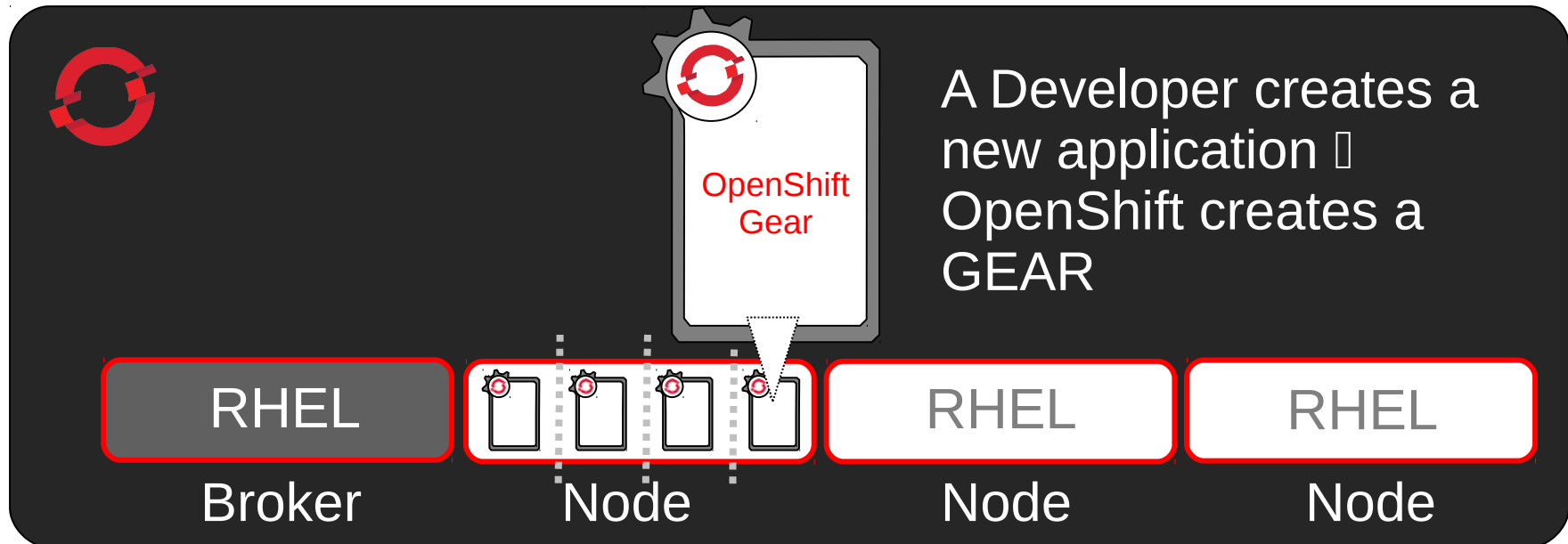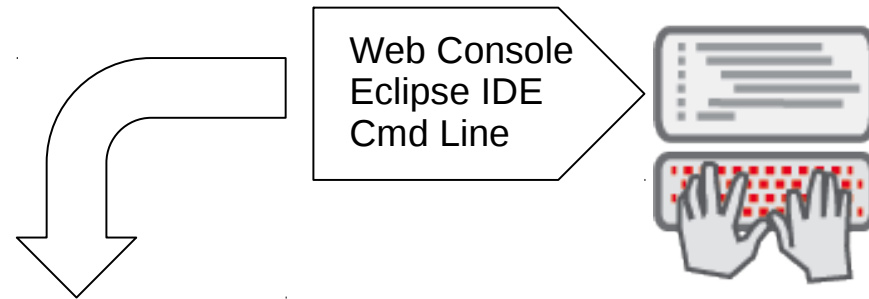
OpenShift Automates Gear Configuration via <u>Cartridges</u>

Web Console
Eclipse IDE
Cmd Line

JBoss

MySQL

CARTRIDGES are how
OpenShift installs
Languages & Middleware

RHEL

RHEL

RHEL

Broker

Node

Node

Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.
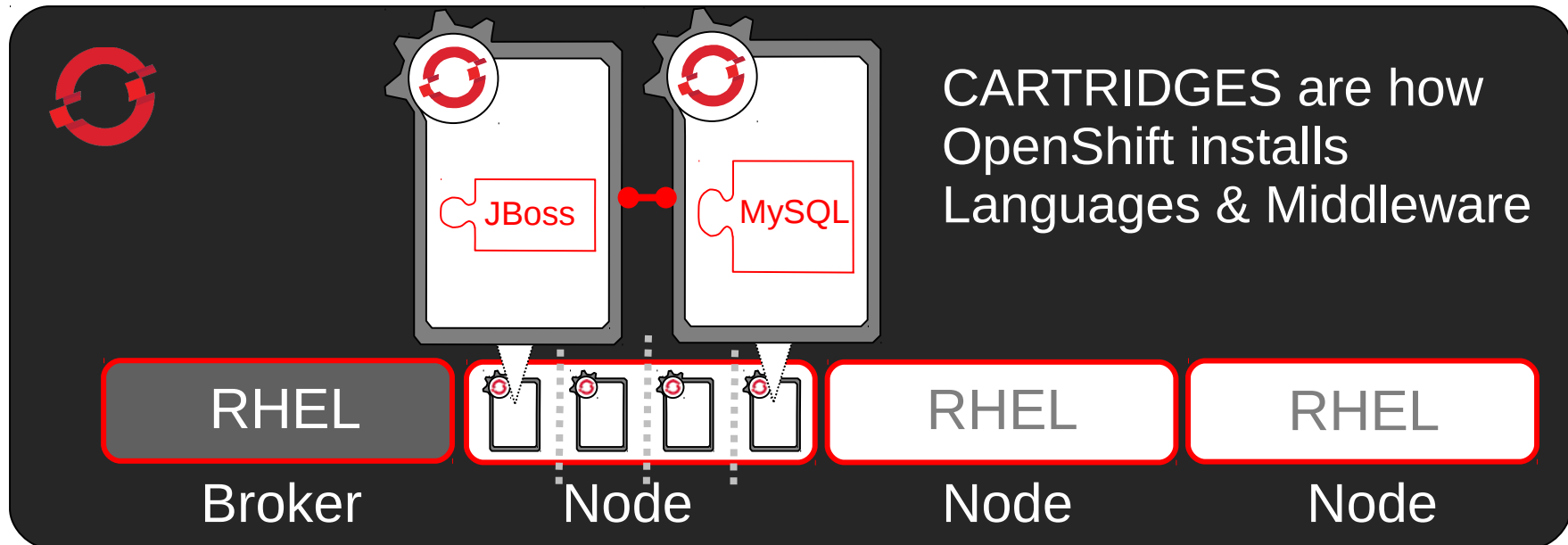
OpenShift Cartridge System Enables User-Built Cartridges
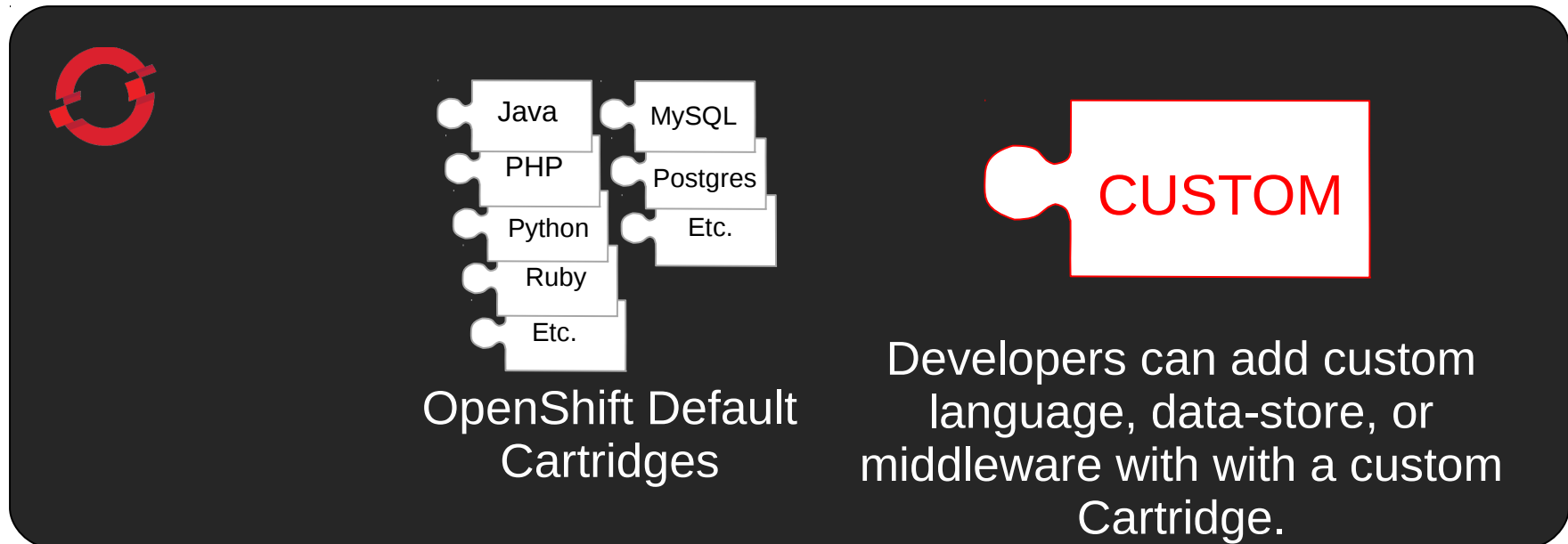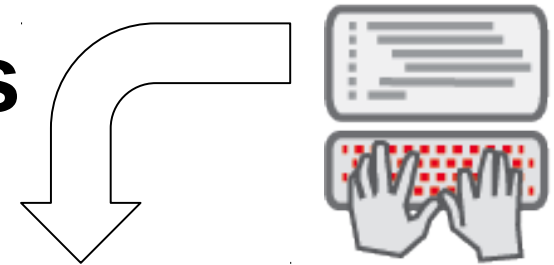
Java

MySQL

PHP

Postgres

Python

Etc.

Ruby

Etc.

OpenShift Default Cartridges

CUSTOM

Developers can add custom language, data-store, or middleware with with a custom Cartridge.

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.

Now, Code and Push

Git Protocol / ssh

Push

Code
Git Repo
JBoss
MySQL

RHEL
Broker

Node

RHEL
Node

RHEL
Node

Developer pushes application code via GIT source code management system

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.
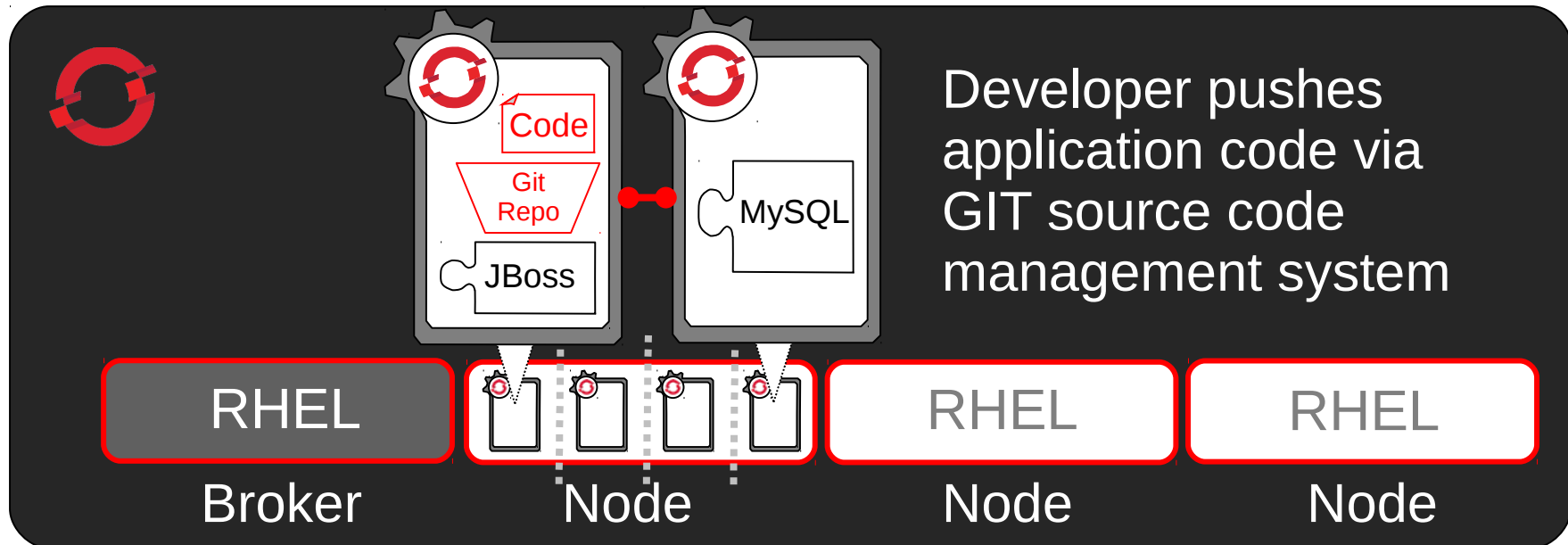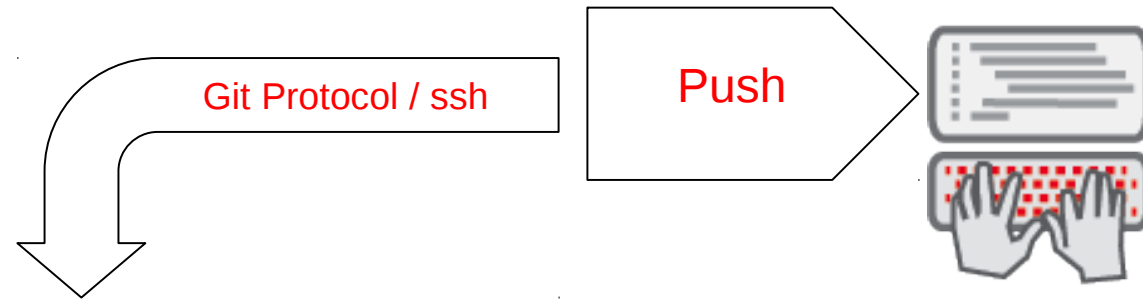
OpenShift Automates
Build, Test, Publish

Maven
(Builds)

Jenkins
(CI)

Code

Git
Repo

JBoss

MySQL

Apache
(HTTP)

RHEL

RHEL

RHEL

Broker

Node

Node

Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by redhat.
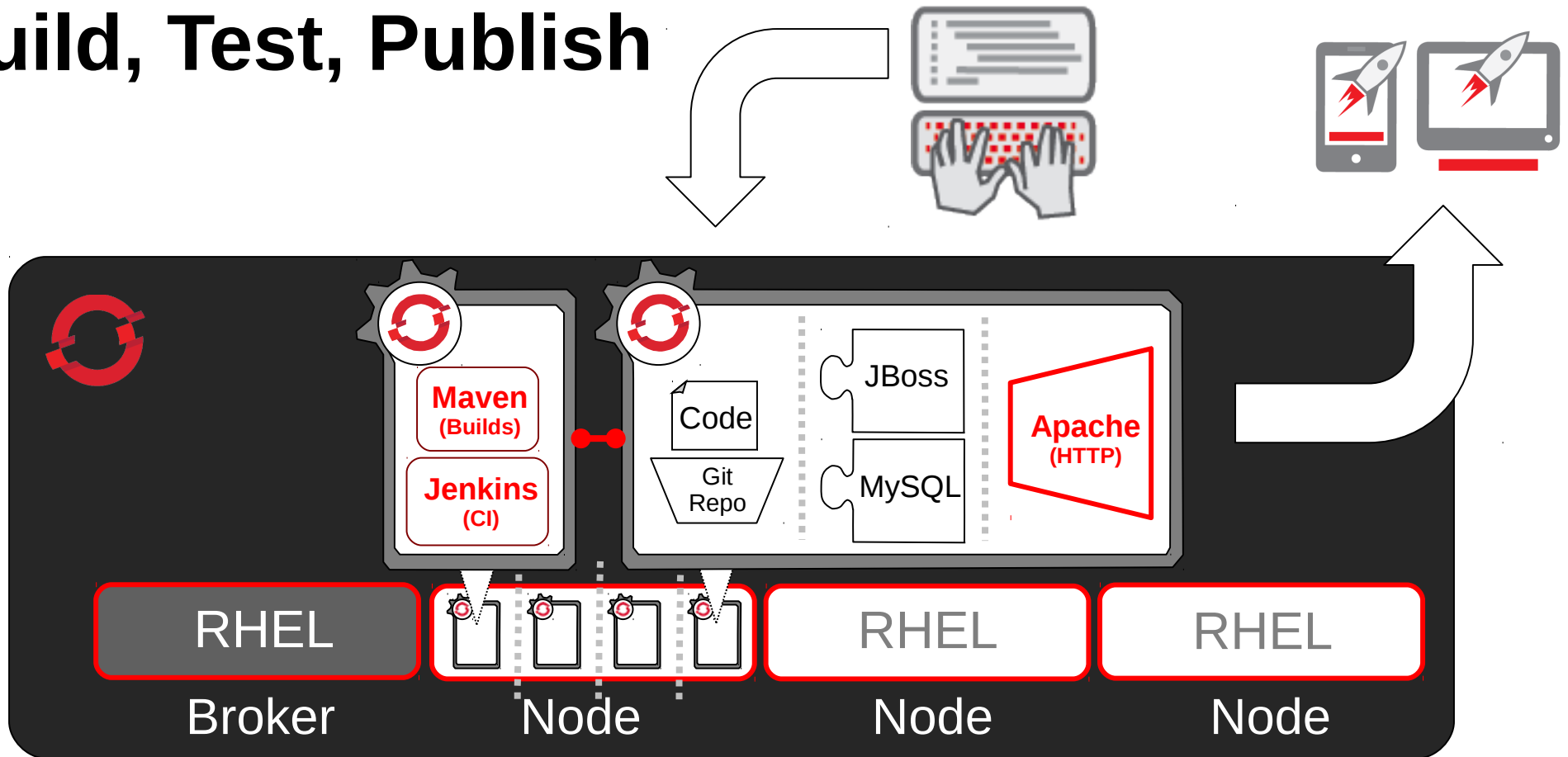
OpenShift Automates Application Scaling!

RHEL

Broker

HA-Proxy

Node

Code

Java

Node

MySQL

Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

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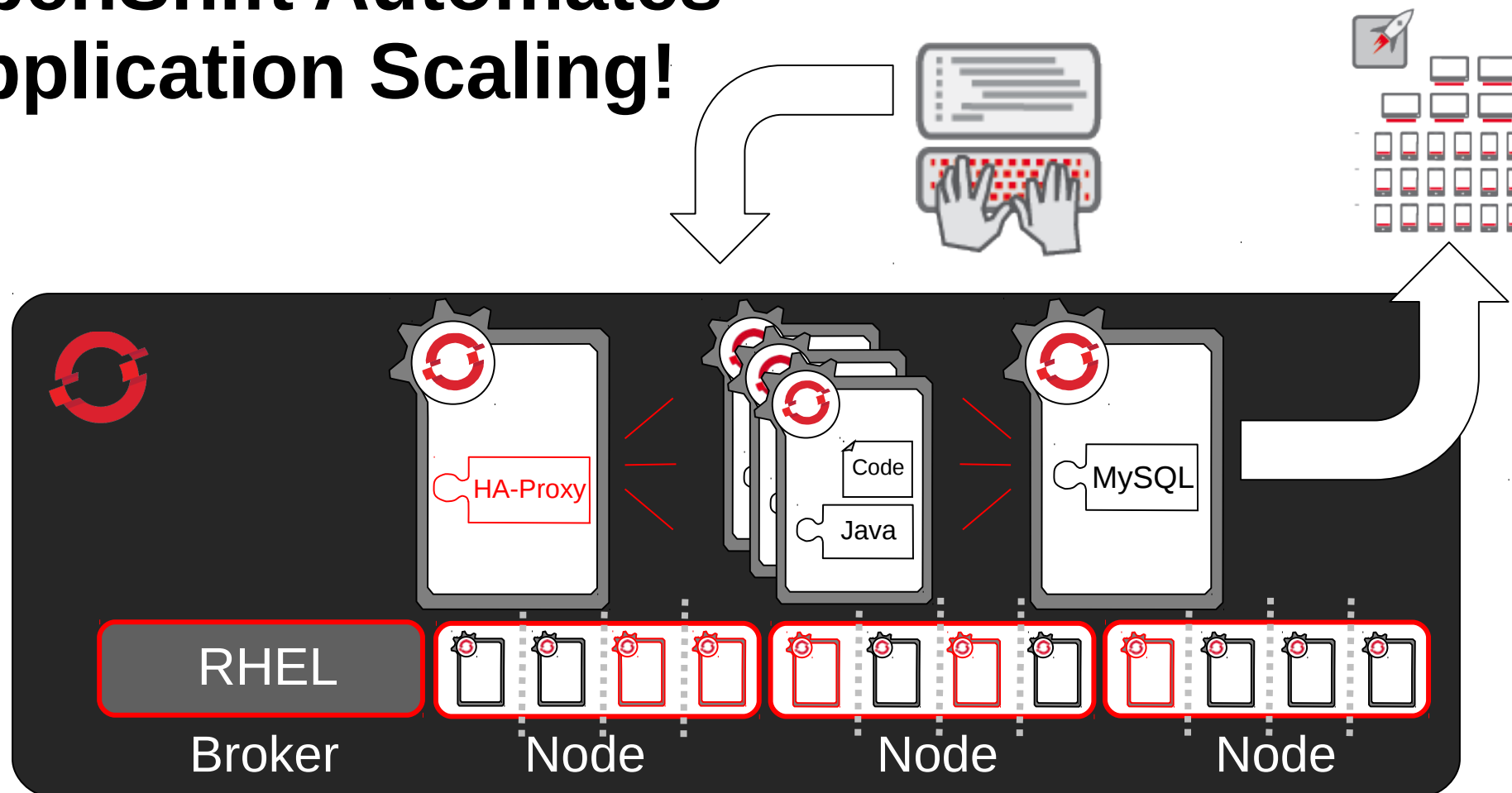
OpenShift Automates the
IT Assembly Line
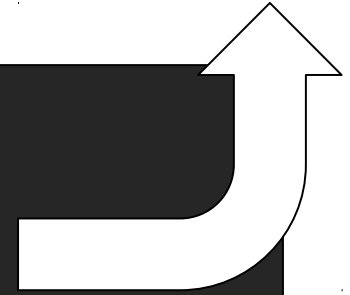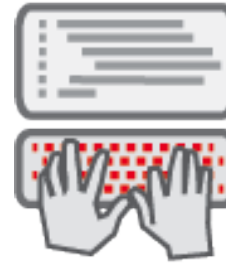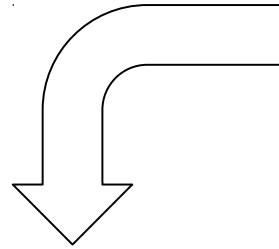
POWERED BY

OPENSHIFT

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal

OPENSHIFT by **red**hat.

OpenShift Architecture
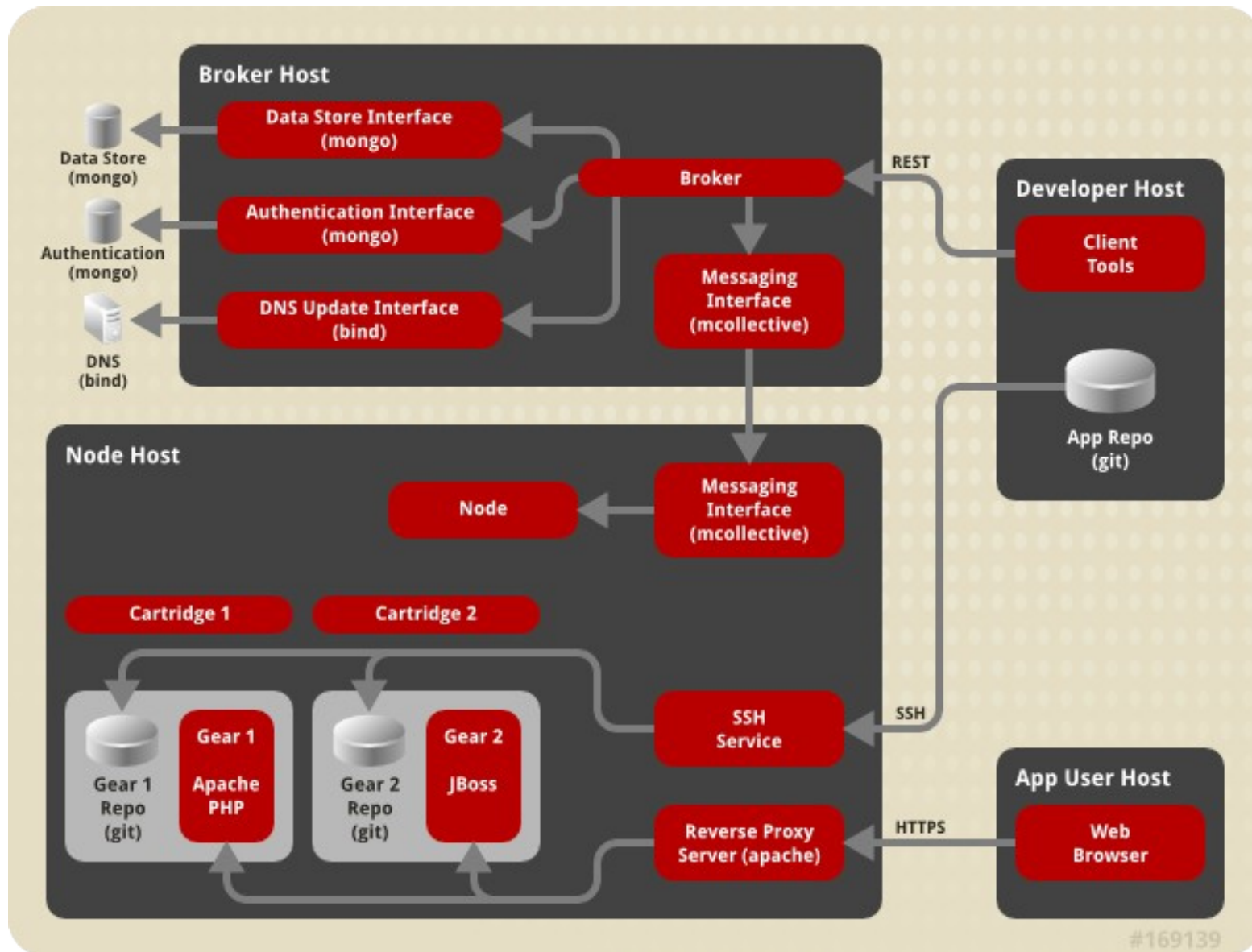
OpenShift Networking
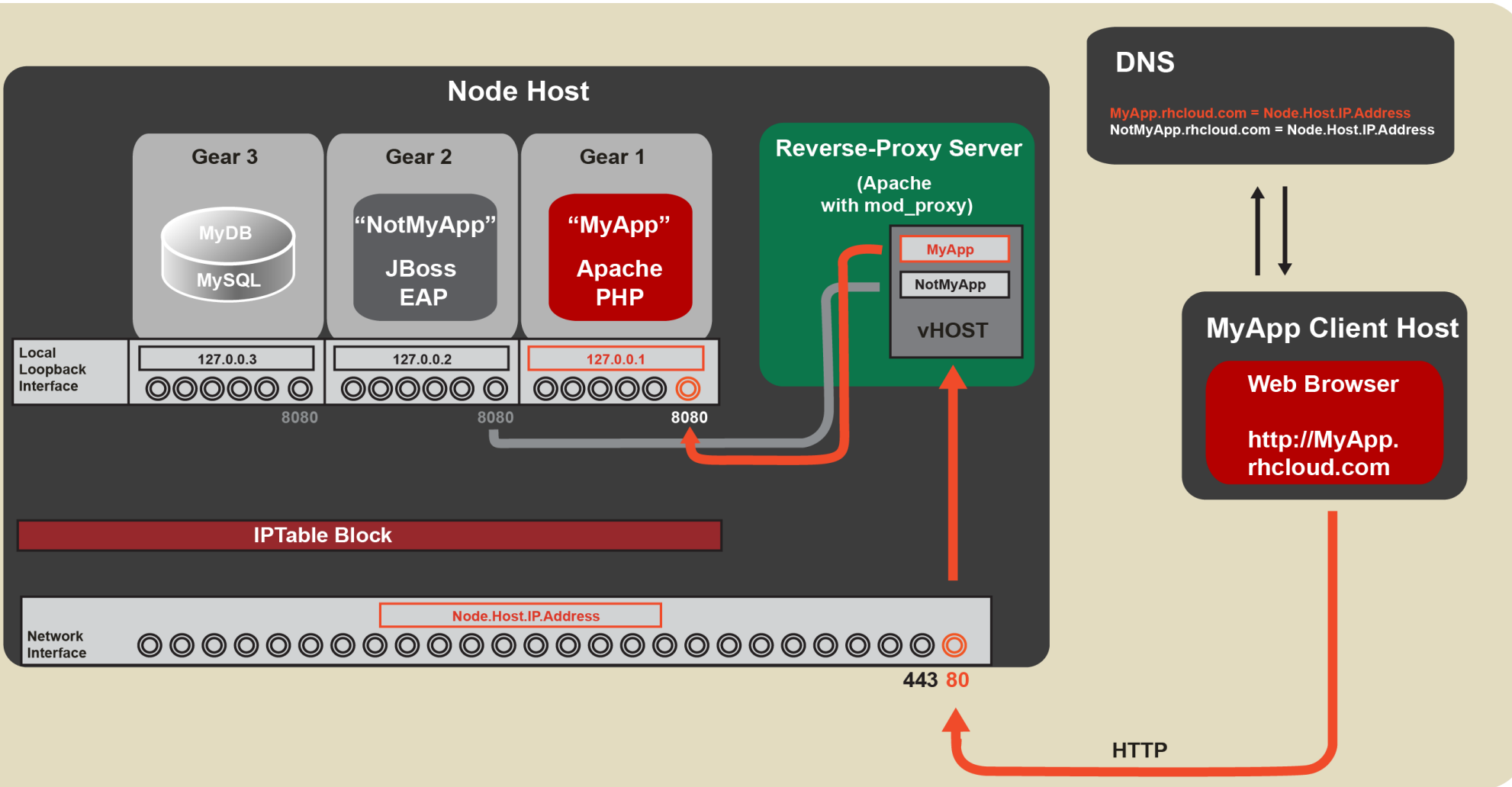
OpenShift Networking – Part 2
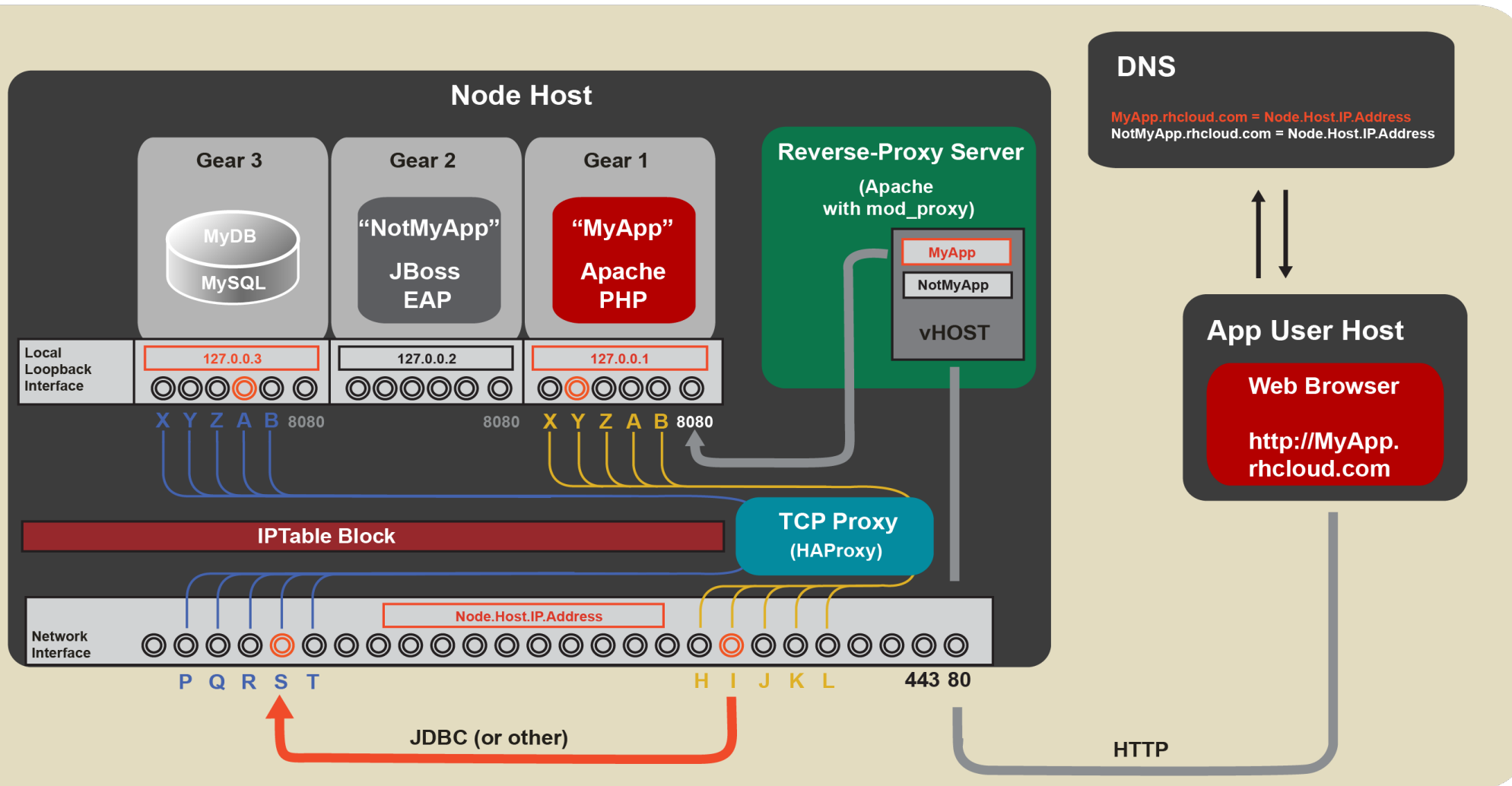
Developers Choose How To Work with OpenShift

Developer IDE Integrations

Command Line Tooling

Web Browser Console

REST APIs

OPENSHIFT by redhat.
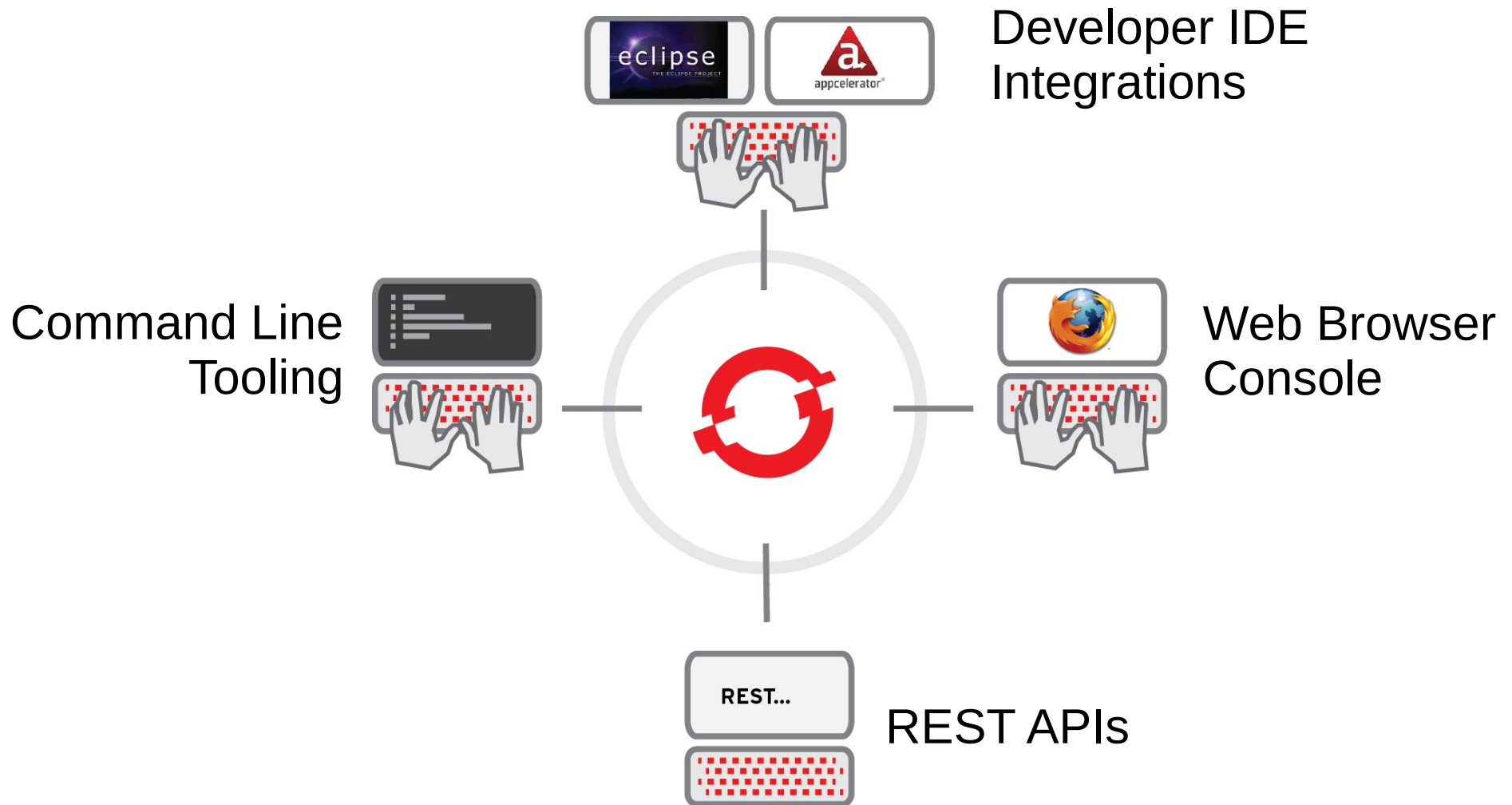
OpenShift's Intuitive and "Responsive" Web Console Runs on Any Device

Are You a Command-Line Fan? OpenShift's RHC CLI Tools

1. Create App
   `rhc app create -a javasample -t jbossas-7`

2. Add MongoDB
   `rhc app cartridge add -a javasample –c mongodb-2.0`

3. Add add EAR file to your deployments directory

   `cd javasample`

   `cp /path/to/ear/earfilename.ear ./deployments`

1. Add the EAR file to git
   `git add ./deployments/earfilename.ear`

2. Push your code
   `git push`

3. Done

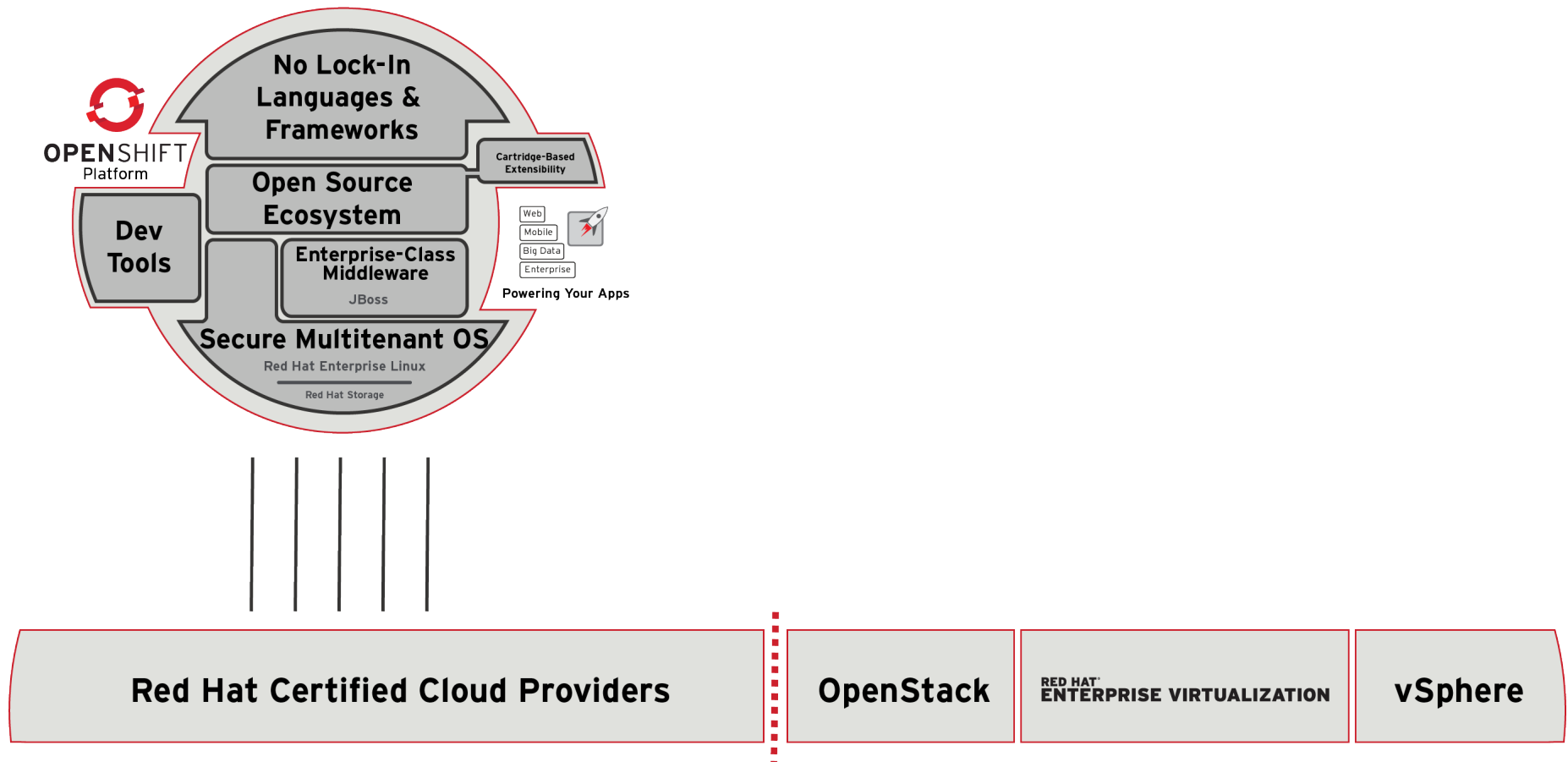# And, of Course, a Powerful JBoss Dev Studio IDE Integration

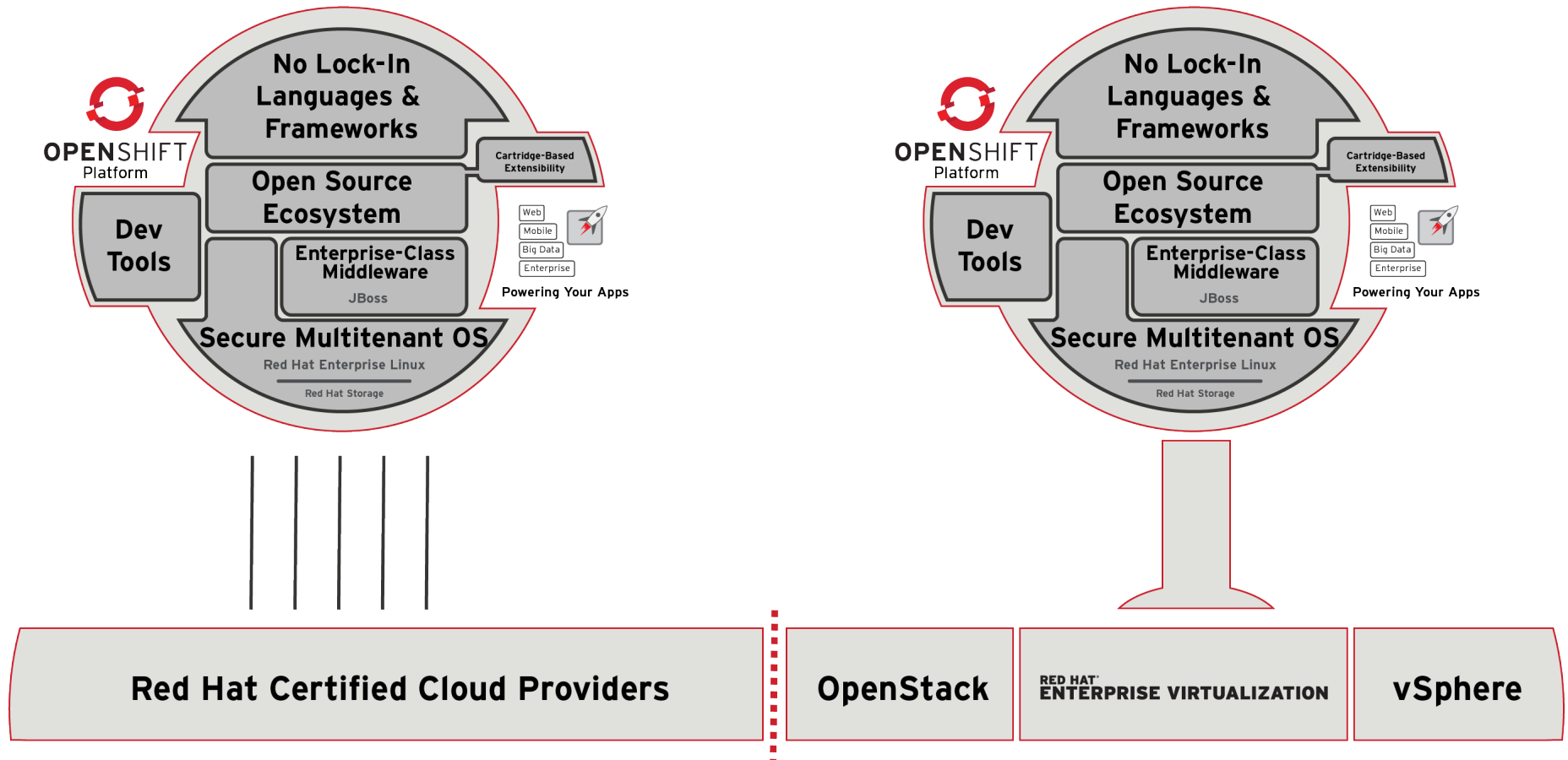OPENSHIFT by redhat.

Developers Choose Languages, Frameworks and Middleware
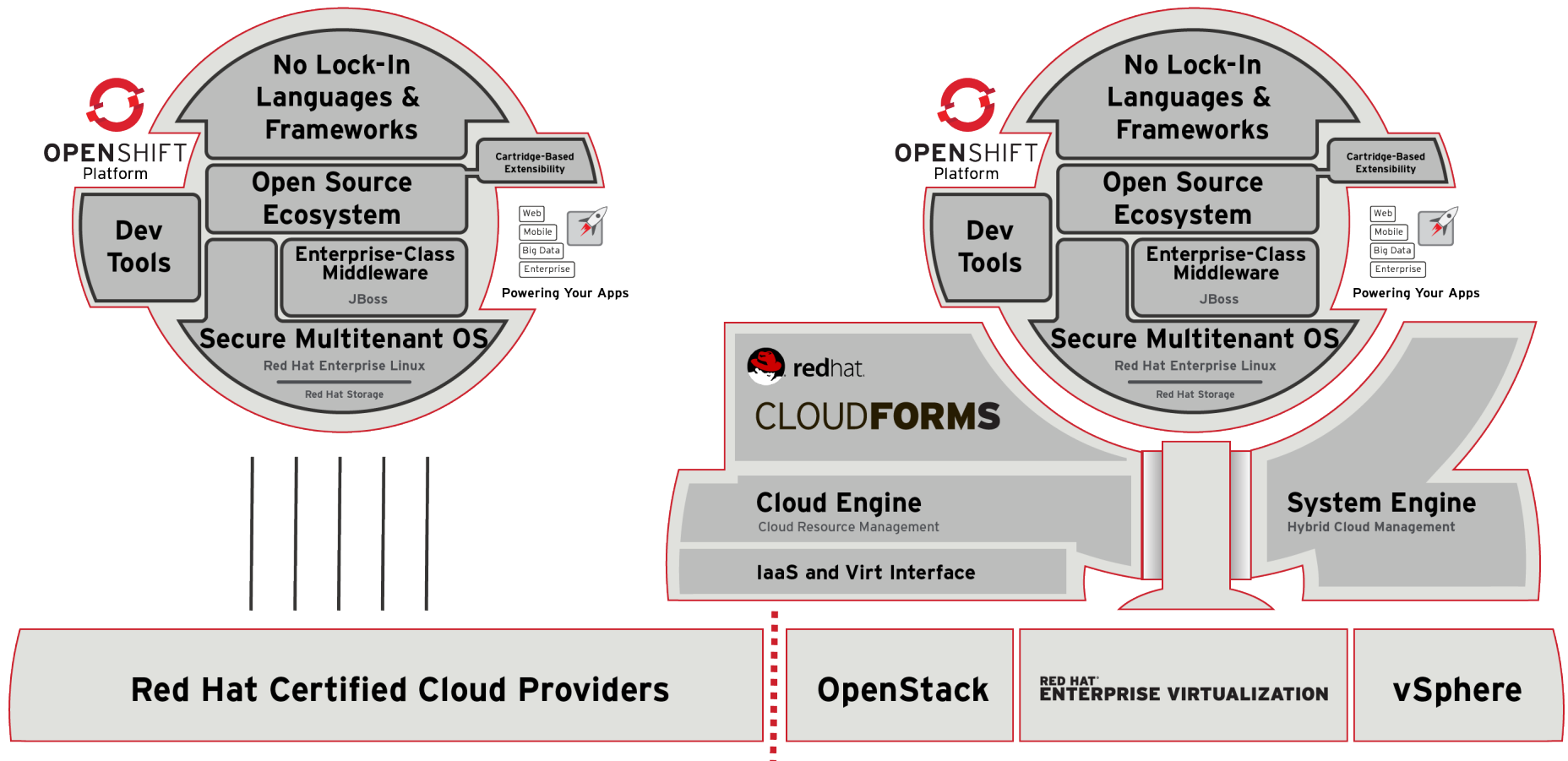
OPENSHIFT by redhat.
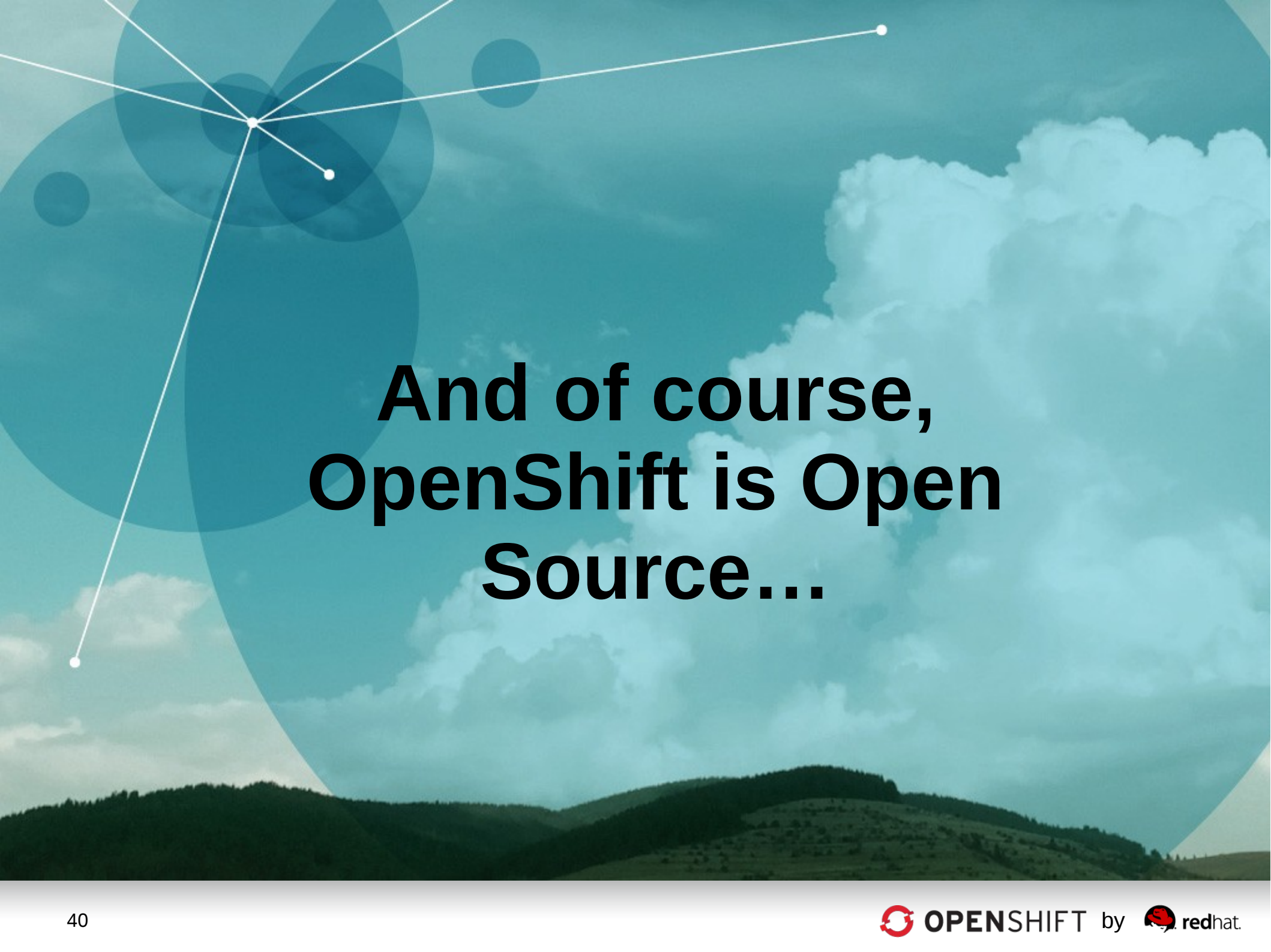
Choice of Public, Private, or Open Hybrid Clouds

Choice of Public, Private, or Open Hybrid Clouds

Choice of Public, Private, or Open Hybrid Clouds

And of course, OpenShift is Open Source…

OPENSHIFT by redhat.

OpenShift Origin

https://openshift.redhat.com/community/open-source
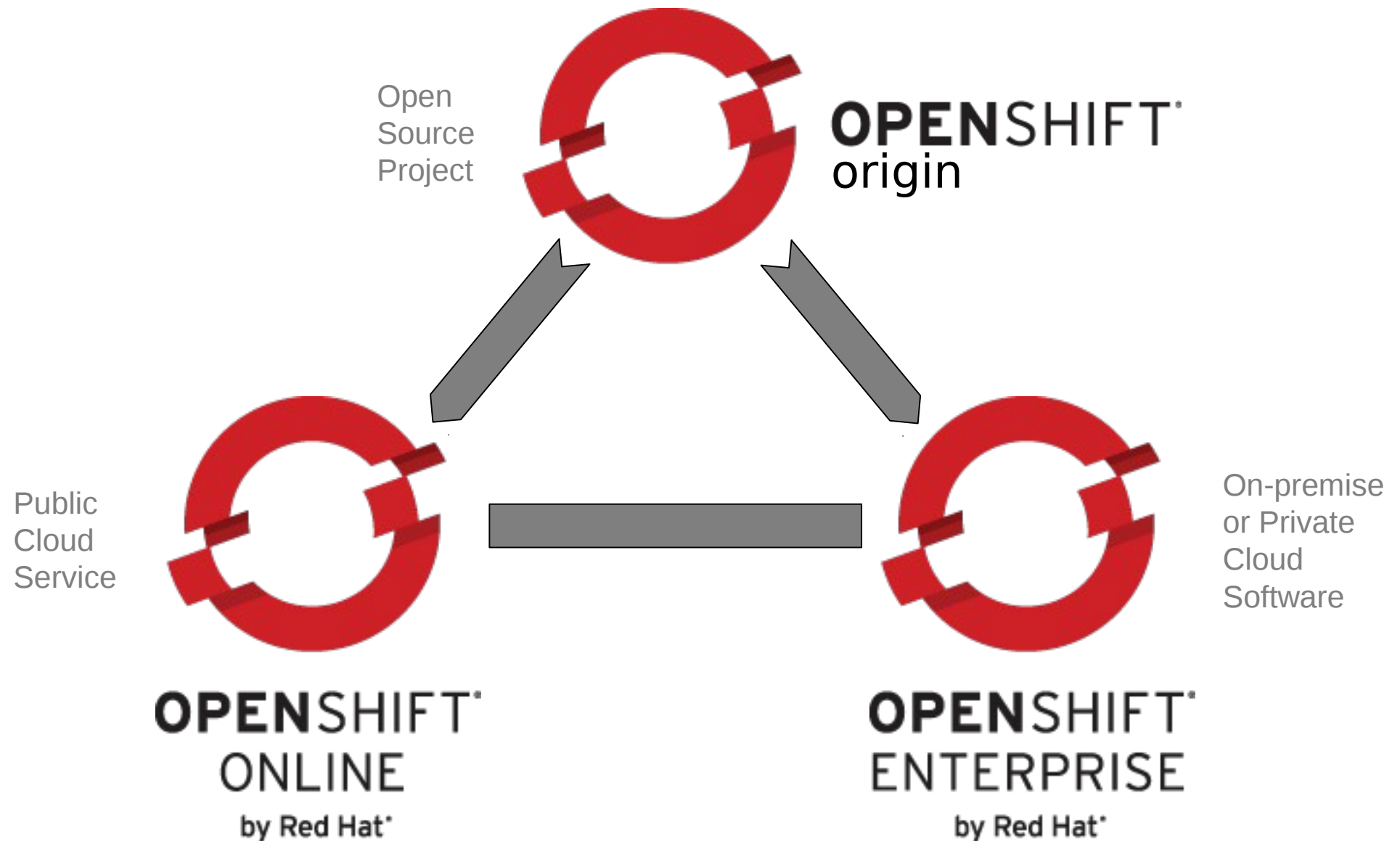https://openshift.github.io

The upstream project for the
OpenShift PaaS platform

- Apache 2.0 License
- Available as:
  - Source, RPMs
  - Virtual Machine image
  - Installer, puppet deployment
- IRC, email, forums
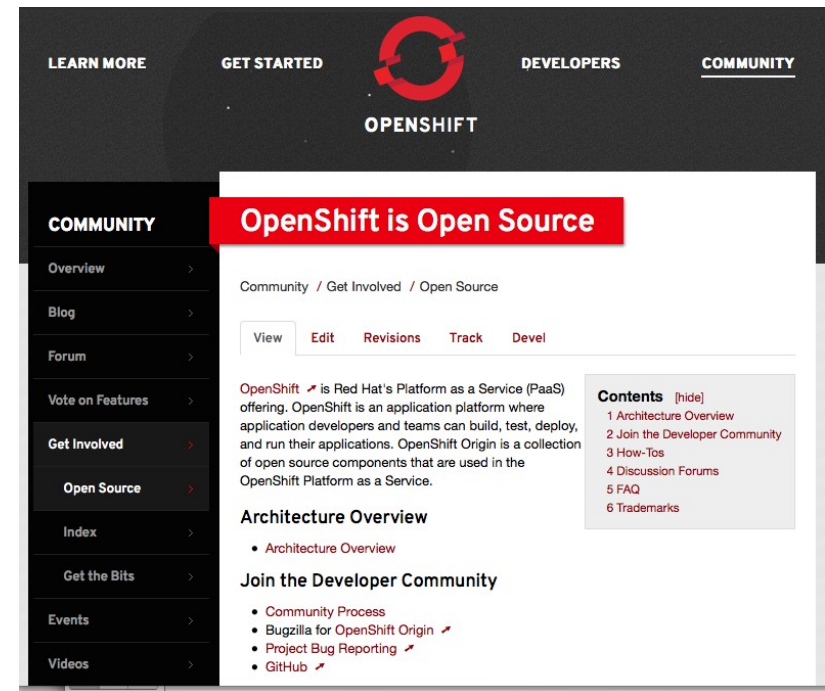
Red Hat's OpenShift Flow of Code

Thank You.

Questions?

Adam Miller
admiller@redhat.com