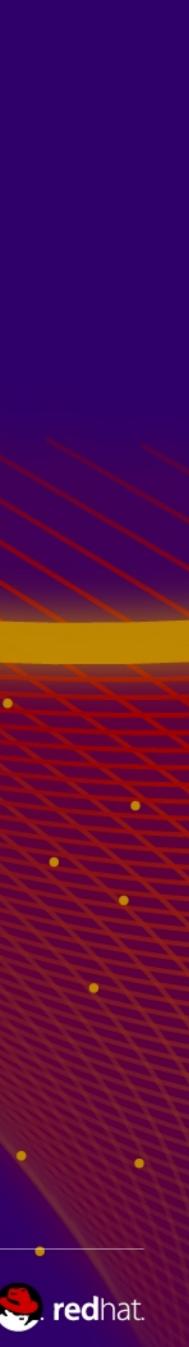


BOSTON, MA JUNE 23-26, 2015

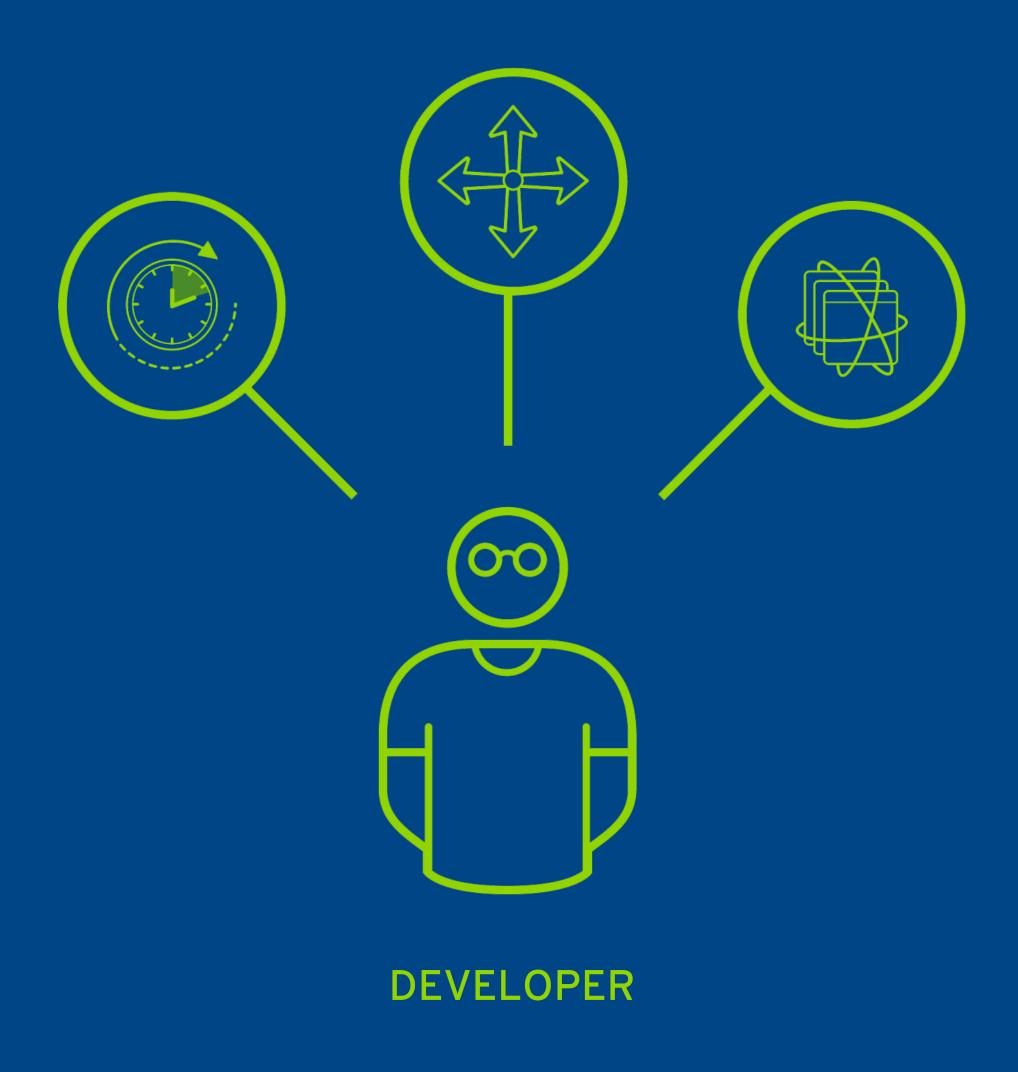
RED HAT'S CONTAINER STRATEGY

Lars Herrmann General Manager, RHEL, RHEV and Containers June 24, 2015





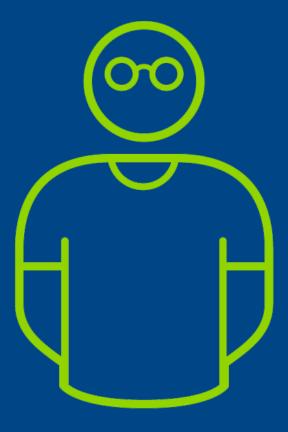
DEVELOPMENT VS I.T. OPERATIONS





IT OPERATIONS

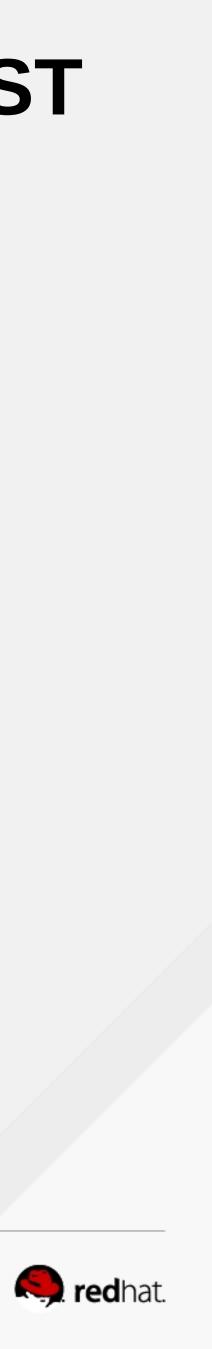




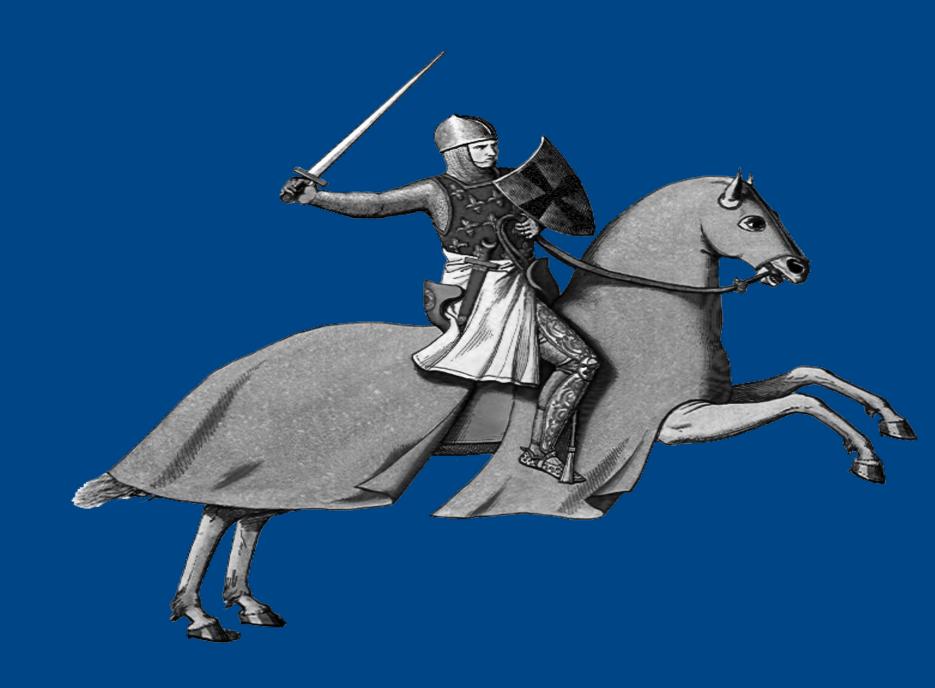
DEVELOPER

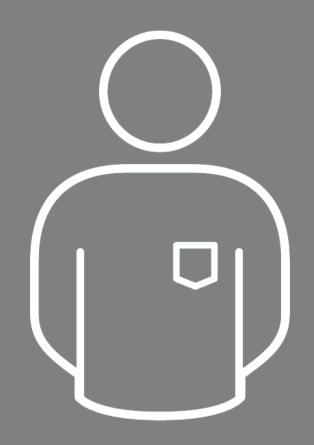
DEVELOPERS WANT TO GO FAST





HOW TO MEET DEMAND?





I.T. OPERATIONS

I.T. OPERATIONS UNDER PRESSURE

CONCRETE SHOES OF LEGACY AND RIGID PROCESSES

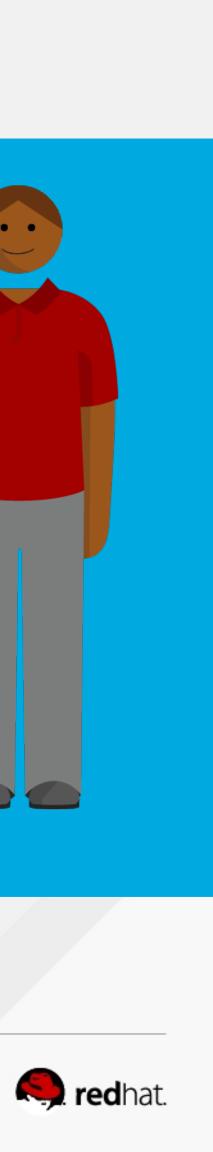


CURRENT STATE

Manual processes Inconsistent environments Dependency hell Legacy inheritance Skills fragmentation

DESIRED STATE

Automation of processes Environmental independence Application autonomy Modernization and expansion Skill abstraction



"To seek the Holy Grail of application delivery"



STEP dock

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Int B I IN R R A R G IN E E E E

This is a heading (level 1)

This is a heading (level 2)

2433

es.ModelNode.j es.ViewNode.js

es.HeadingModel.js es.ListitemModel.js

es.Listiterindoel.js es.ParagraphModel. es.SurfaceModel.js es.TableCellModel.js es.TableRowModel.js

views es.ContentView.js es.DocumentView.js es.HeadingView.js es.ListitemView.js es.Listiview.js es.ParagraphView.js es.TableCellView.js es.TableKowView.js es.TableKowView.js es.TableKowView.js

es.TableView.Js es.js es.Position.js es.Range.js es.Surface.css es.Transaction.js > synth jquery.Js qunit.css qunit.js v tests > annotations v hype ex. Docume

es.ModelNode.test.j

es.ModelNoder es.test.js index.html > serializers > synth > transactions .project README

images models es.Docu

lime Text 2 File Edit

le/nodejs

module('Models')

77
77
8 es.DocumentWodel.prototype.rebuild = function(regions) {
79
 for (var i = 0; i < regions.length; i++) {
80
 var region = regions[1];
81
 region.range.normalize();
82
 var nodes = this.buildNodesFromData(
83
 this.data.slice(region.start, region.end)
84
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 1085
 es.arrayInsert

 1086
 }

 1087
 }:

 1088
 !

 1089
 /**

 1090
 * Applies a transacti

 1091
 *

 1092
 * @method

 1093
 * @param {es.Transacti

 1094
 */

 1095
 es.DocumentModel.proto

 es.arrayInsert(this, region.index, nodes); ion to the content d 1094 */
1095 es.DocumentModel.prototype.commit Iffunction(transaction) {
1096 var state = {
1097 'data': this.data,
1098 'tree': this.
1099 'cursor': 0,
1100 'set': [],
1101 'clear': [],
1102 'rebuild': []
1103 }; feedule to feedule to feedule the second secon and adjust lengt 1118 * @method 1119 * @param {es.Transaction} 1120 */ 1121 es.DocumentModel.prototype.rollback = funct 1122 var state = { 1123 'data': this.data, 1124 'tree': this. 1125 'cursor': 0, 1126 'set': [], 1127 'clear': [], 1128 'rebuild': [] on(transaction)

n Find View Tools Project Window Helr

urn tx:

f (offset < this.data.length) {
 tx.pushRetain(this.data.length - offset)</pre>

'rebuild':[]
};
(var i = 0, length = transaction.length; i < length; i++) {
 var operation = transaction[1];
 if (operation.type in es.DocumentModel.operations) {
 if (operation.type in es.DocumentModel.operation.type].rollback.call(s
 es.DocumentModel.operations[operation.type].rollback.call(s
 else {
 throw 'Invalid operation error. Operation type is not suppor'
 throw 'Invalid operation error. Operation type is not suppor'
 throw 'Invalid operation error.operation type is not support'
 throw 'Invalid operation error.operation type is not support'
 throw 'Invalid operation error.operation error.operation

SAMSUNG



CONSISTENCY, PORTABILITY, CHOICE!

SUCCESS!





datace









CONTAINERS DELIVER MANY BENEFITS

Greater application mobility/portability

Ability to deliver/deploy applications faster

Greater deployment flexibility

Faster provisioning



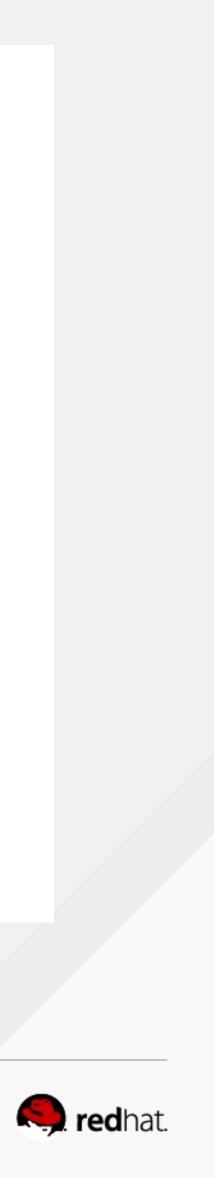
Base: 171 IT and Developer/programmer decision-makers at companies with 500+ employees in APAC, EMEA, and NA Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat, January, 2015

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How important are the following benefits of containers to your organization?

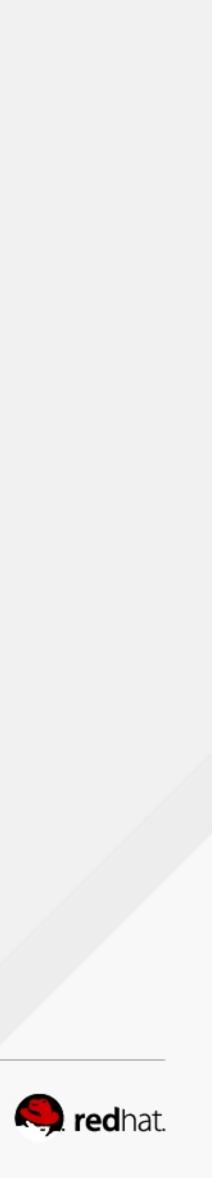




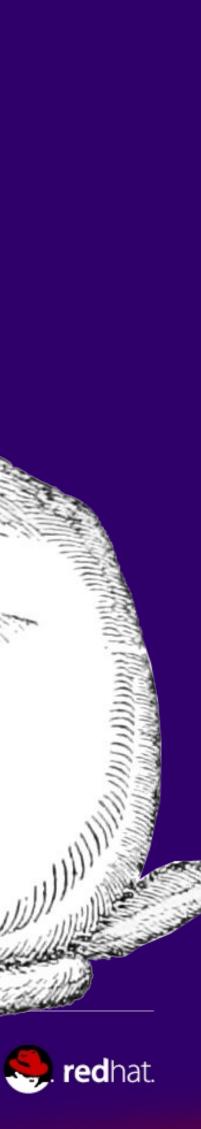




...STEP 1.1?



THE TRUTH ABOUT CONTAINERS

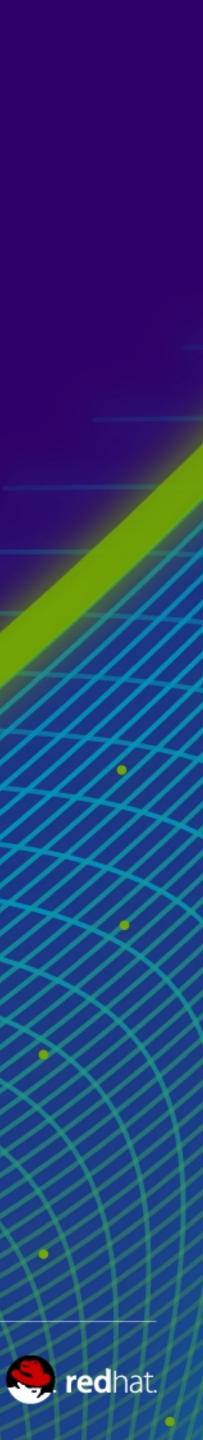


THE MOST INTERESTING APPLICATION IN THE WORLD

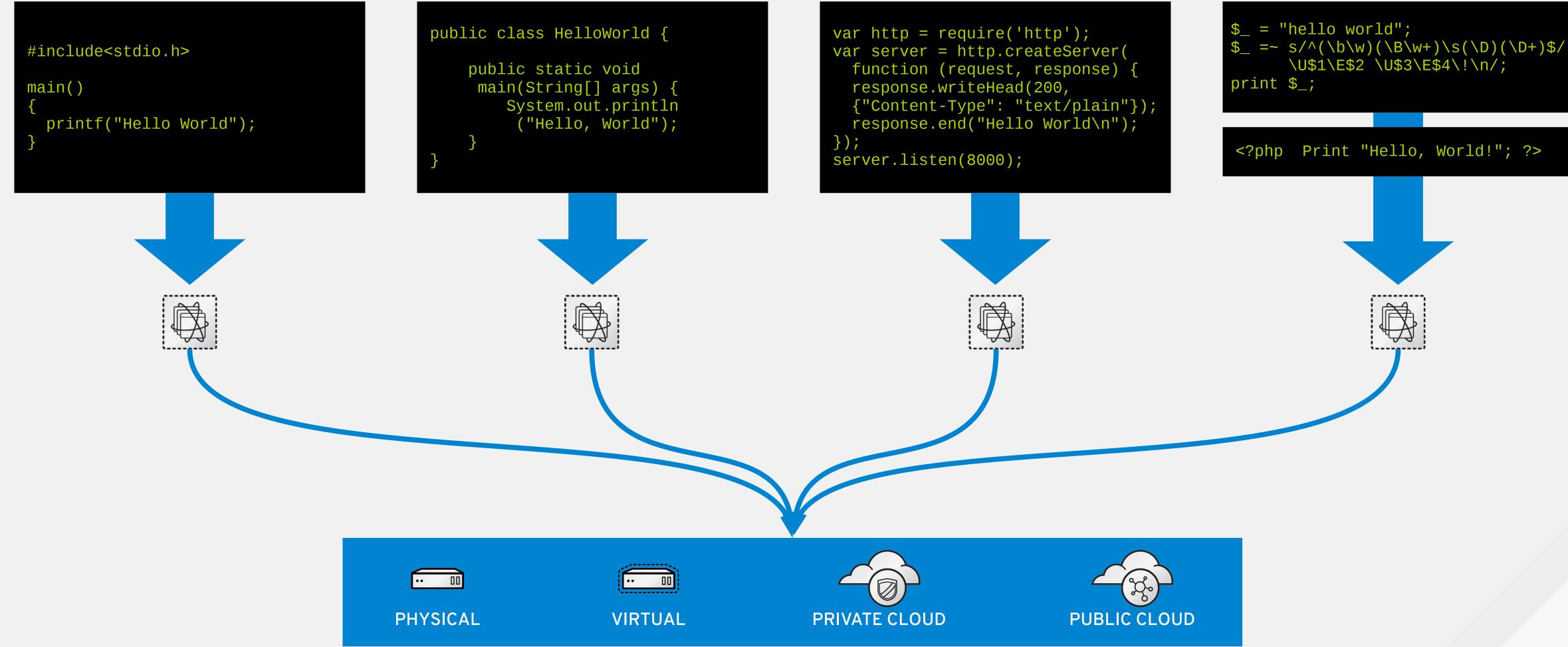
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LET'S LOOK AT...



THE PROMISE: CONSISTENT DELIVERY FOR ANY LANGUAGE

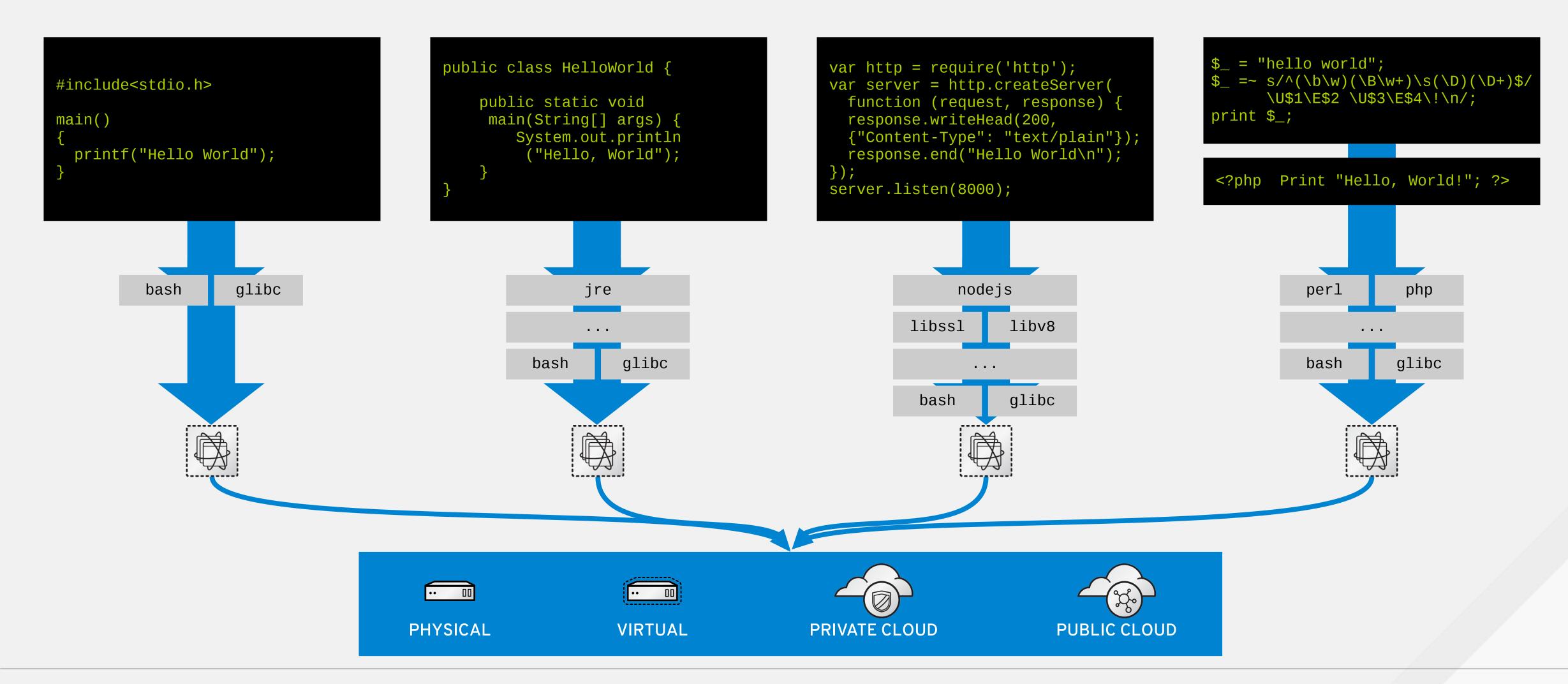








LANGUAGE RUNTIMES

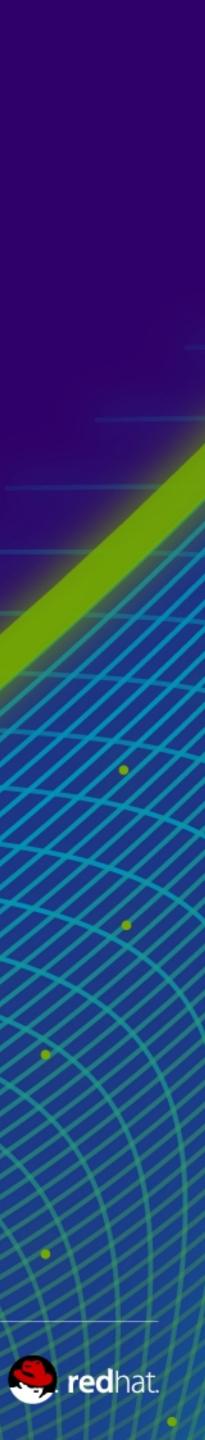






WHERE DO THESE RUNTIMES COME FROM?

• • • •

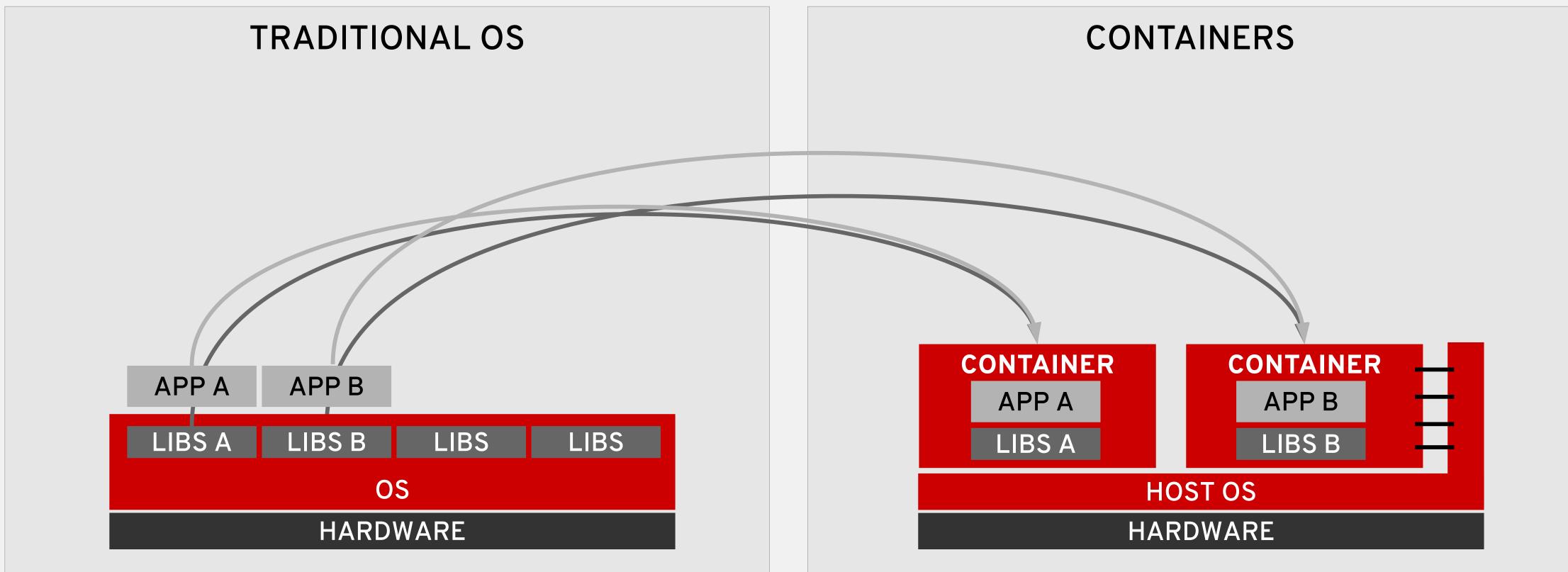


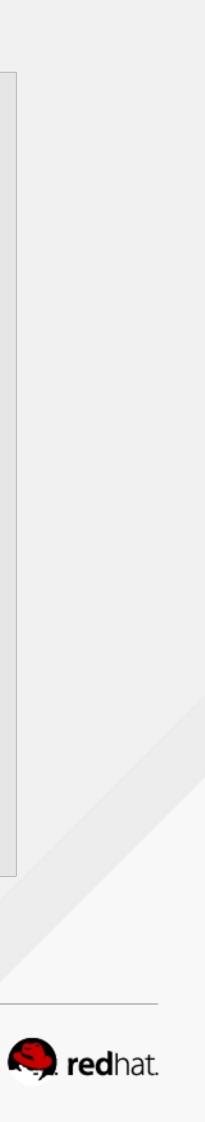


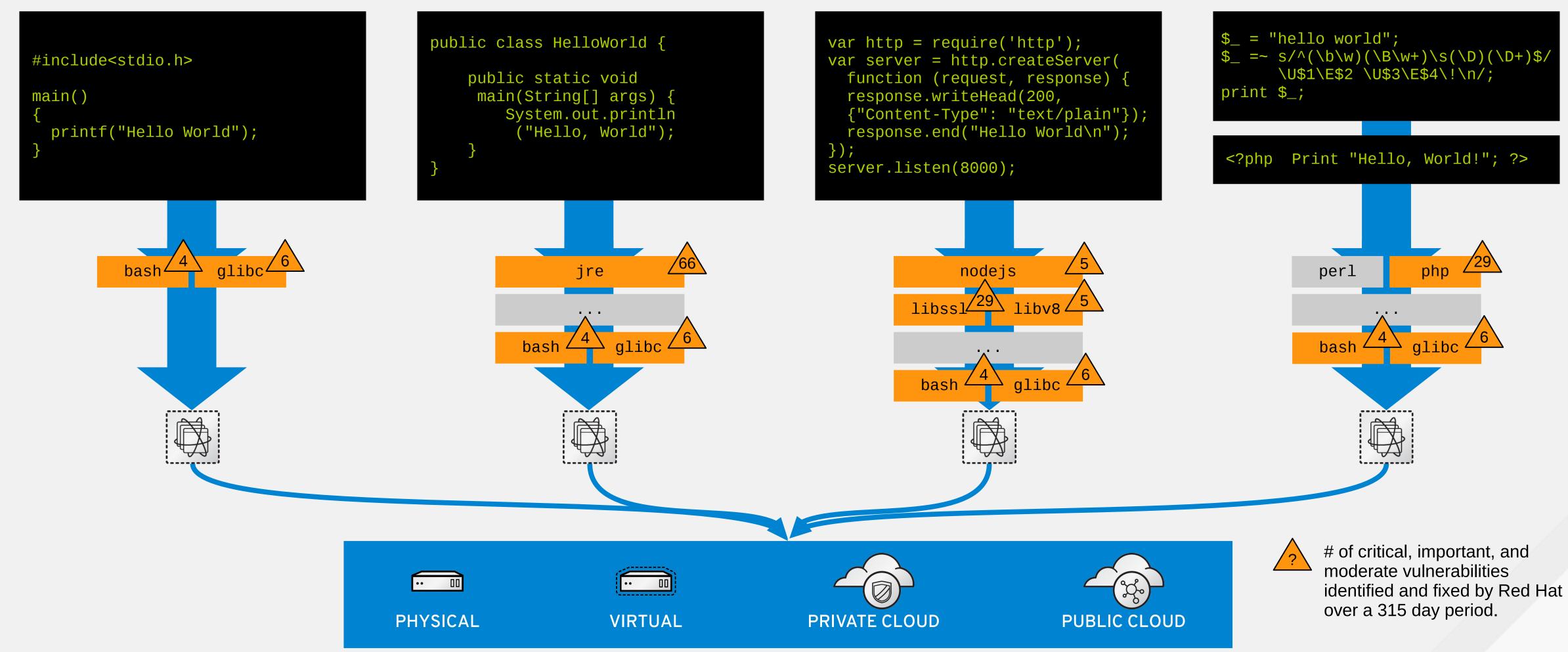


مراسط المراسي

CONTAINERS ARE AN OS TECHNOLOGY







SECURITY IMPLICATIONS







AND THAT'S WHY THEOPS GUY IS FREAKING OUT

Run away!

Run Away! Run Away!

Holy Grail

awaits nasty teet



TOP CURRENT CONTAINER CHALLENGES

What are the top three challenges your organization has experienced so far in its use of containers?

Total mentions (sum of responses of '1', '2', and '3')

Variable performance

Integration with existing development tools and processes

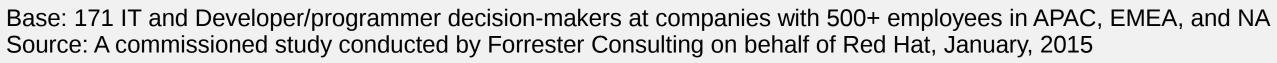
Management

Lack of certification or digital structure

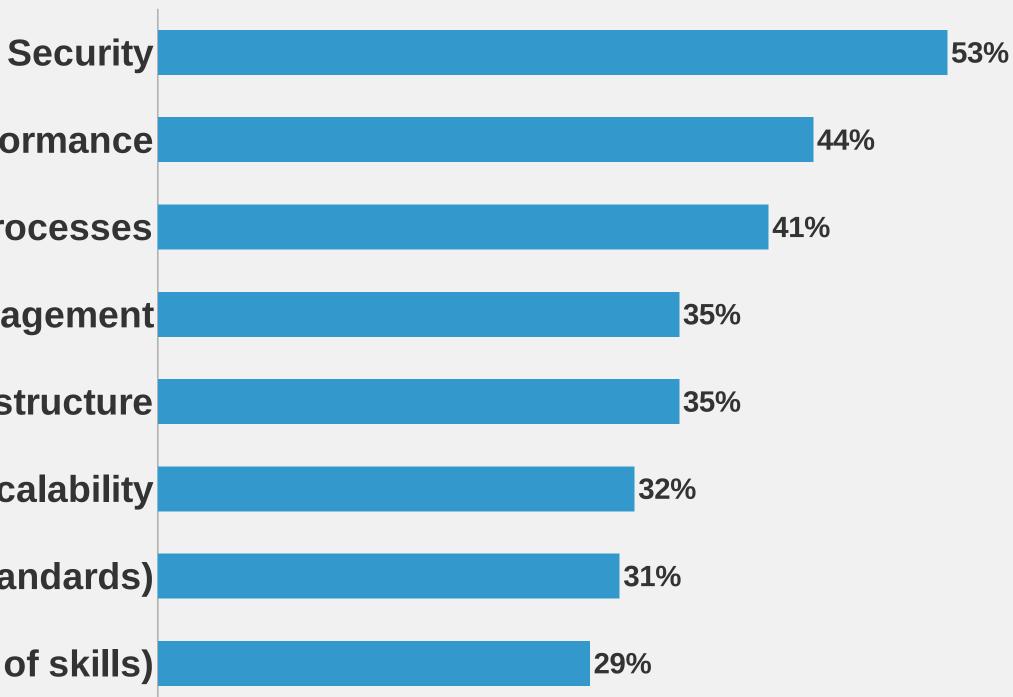
Scalability

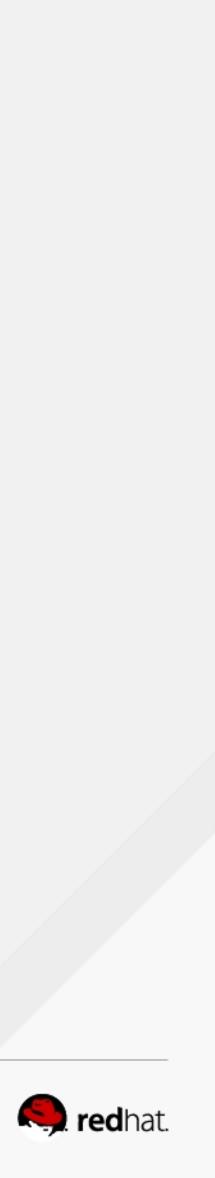
Consistency (lack of standards)

Training and Education (lack of skills)





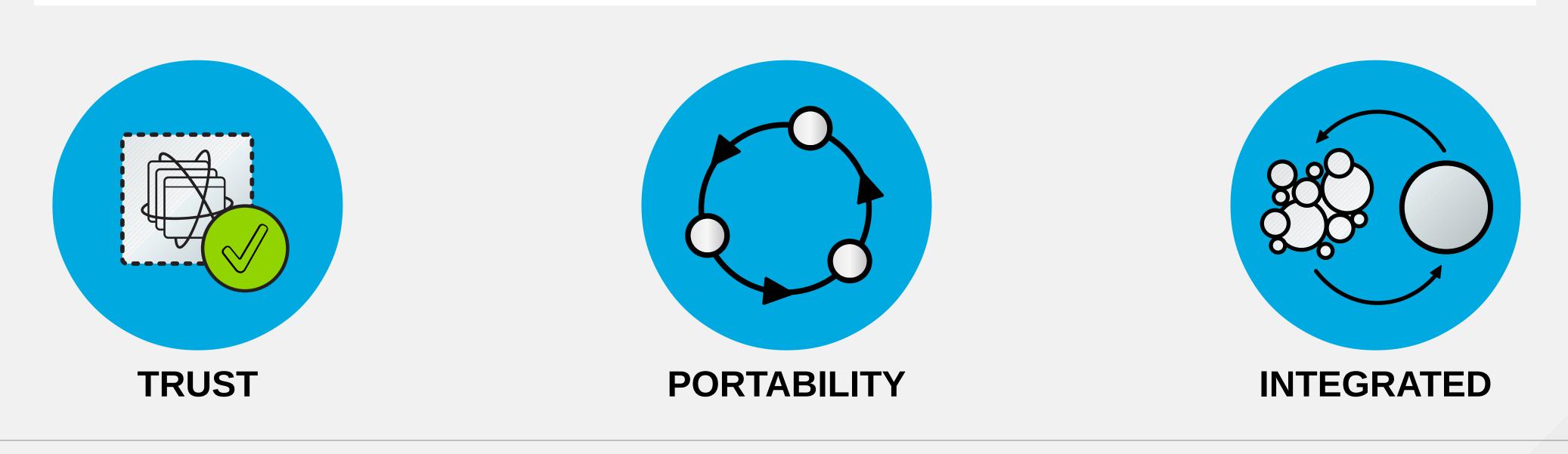




RED HAT'S CONTAINER STRATEGY

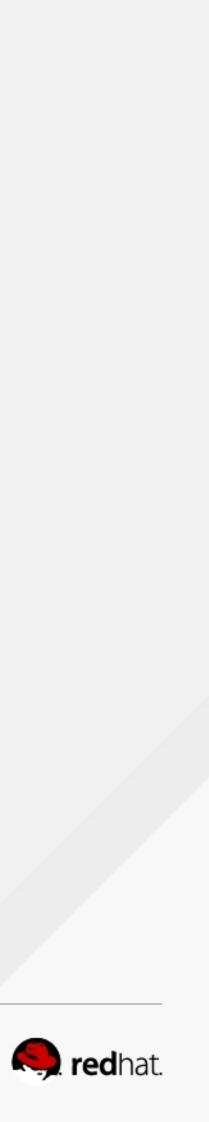
GUIDING PRINCIPLES

1) Bring containers to the enterprise 2) Address adoption challenges



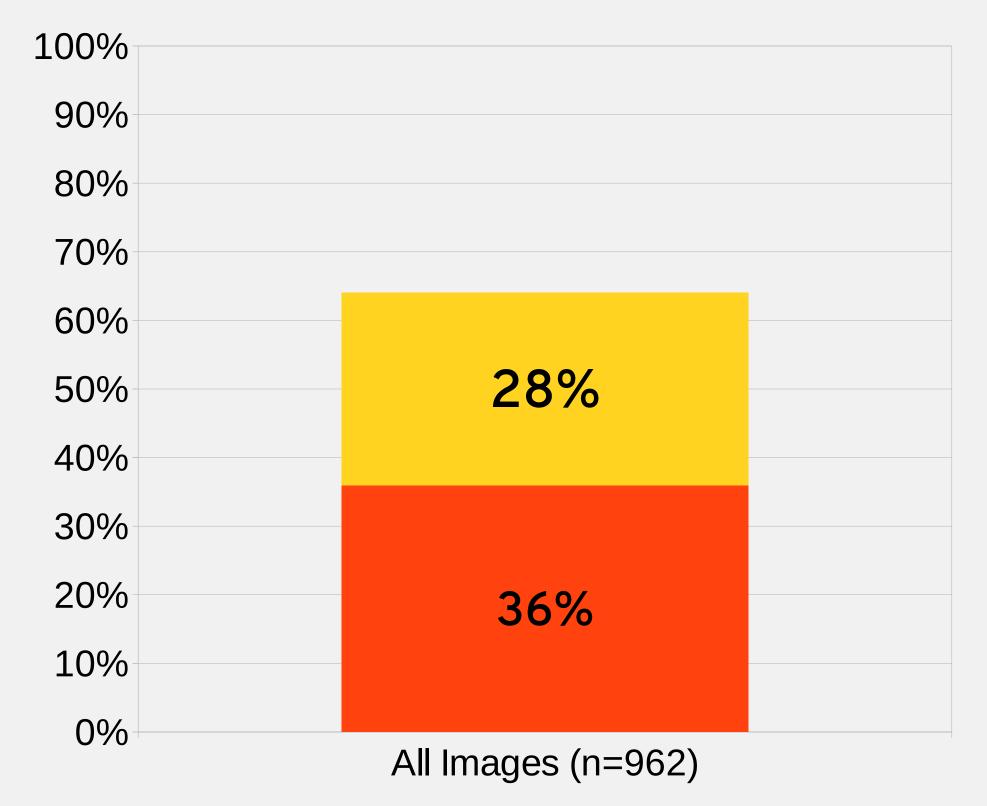
3) Make it all about the application 4) Enable choice





SECURITY IS DEFINED INSIDE THE CONTAINER

36% of official images available for download contain high priority security vulnerabilities

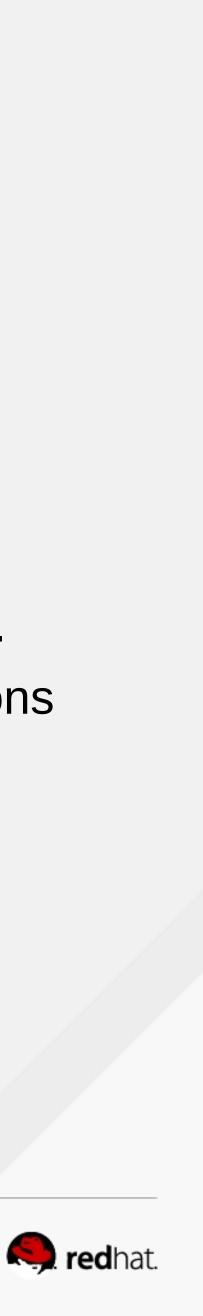


Source: Over 30% of Official Images in Docker Hub Contain High Priority Security Vulnerabilities, Jayanth Gummaraju, Tarun Desikan, and Yoshio Turner, BanyanOps, May 2015 (http://www.banyanops.com/pdf/BanyanOps-AnalyzingDockerHub-WhitePaper.pdf)

- High vulnerabilities: ShellShock (bash), Heartbleed (OpenSSL), etc.
- Medium vulnerabilities: Poodle (OpenSSL), etc.
- Low vulnerabilities: gcc: array memory allocations could cause integer overflow

Medium priority

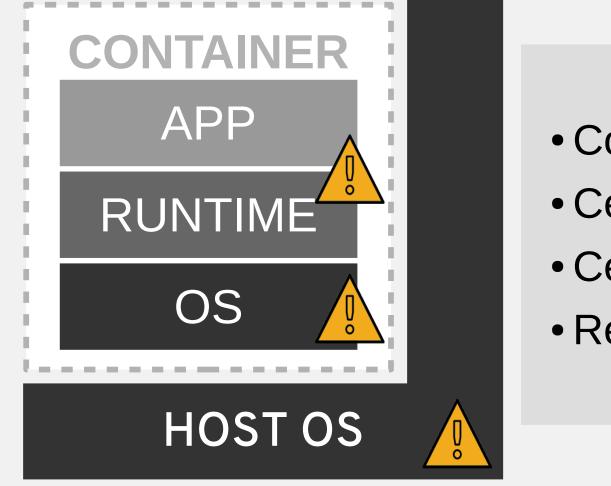
High priority



RED HAT CONTAINER CERTIFICATION

UNTRUSTED

- Will what's inside the containers compromise your infrastructure?
- How and when will apps and libraries be updated?
- Will it work from host to host?

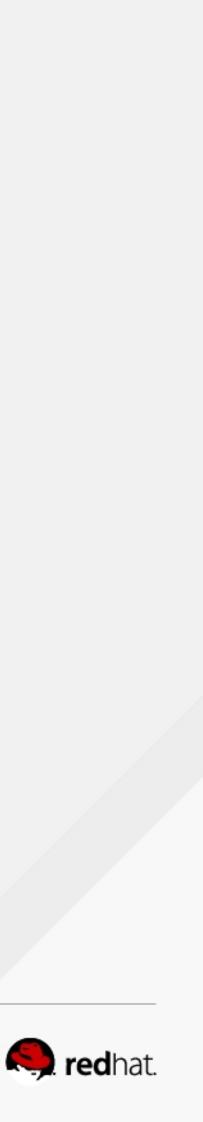


- Container Development Kit
- Certification as a service
- Certification catalog
- Red Hat Container Registry

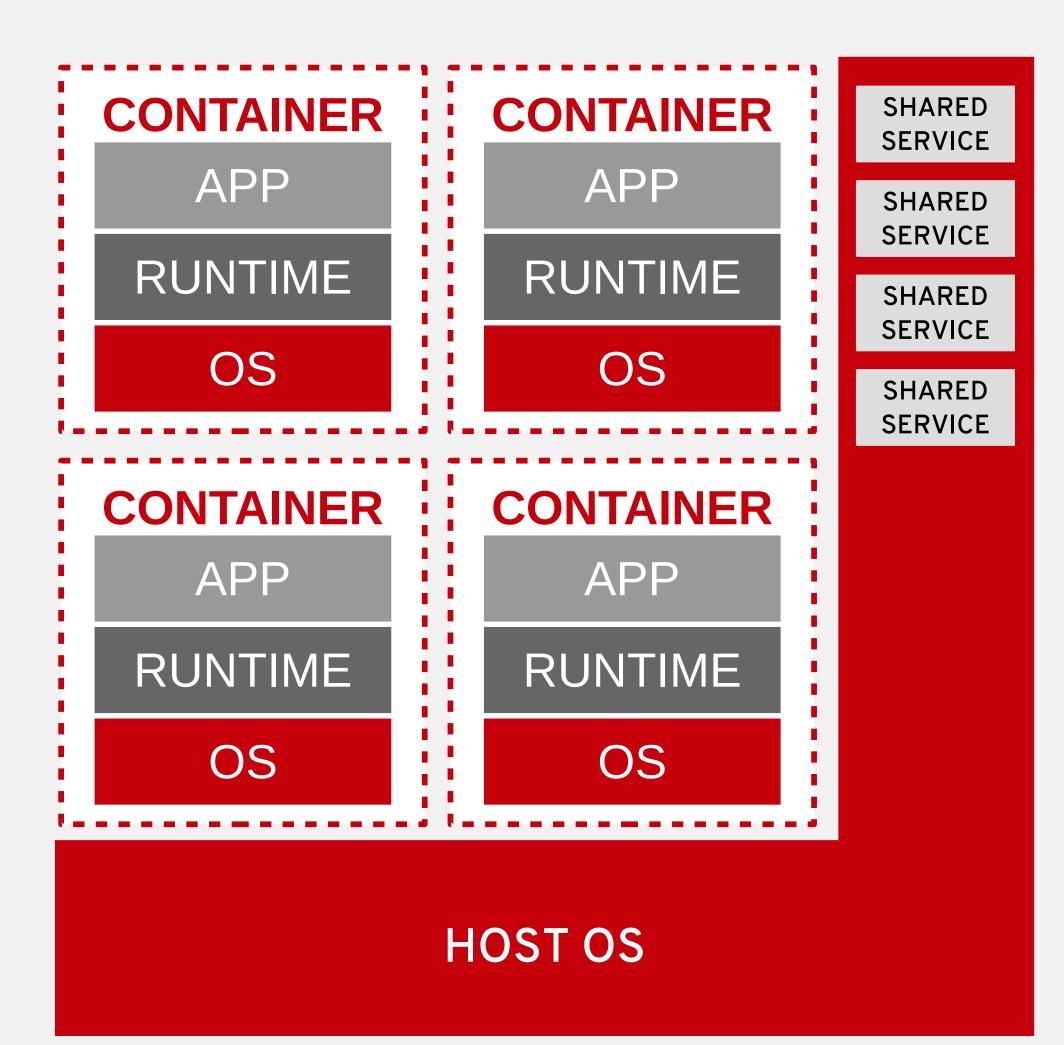
RED HAT CERTIFIED

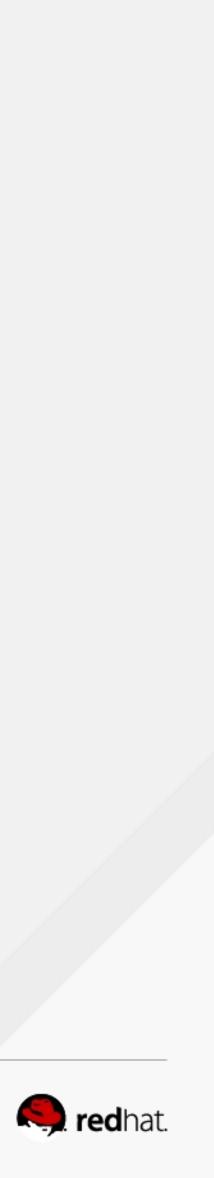
- Trusted source for the host and the containers
- Trusted content inside the container with security fixes available as part of an enterprise lifecycle
- Portability across hosts



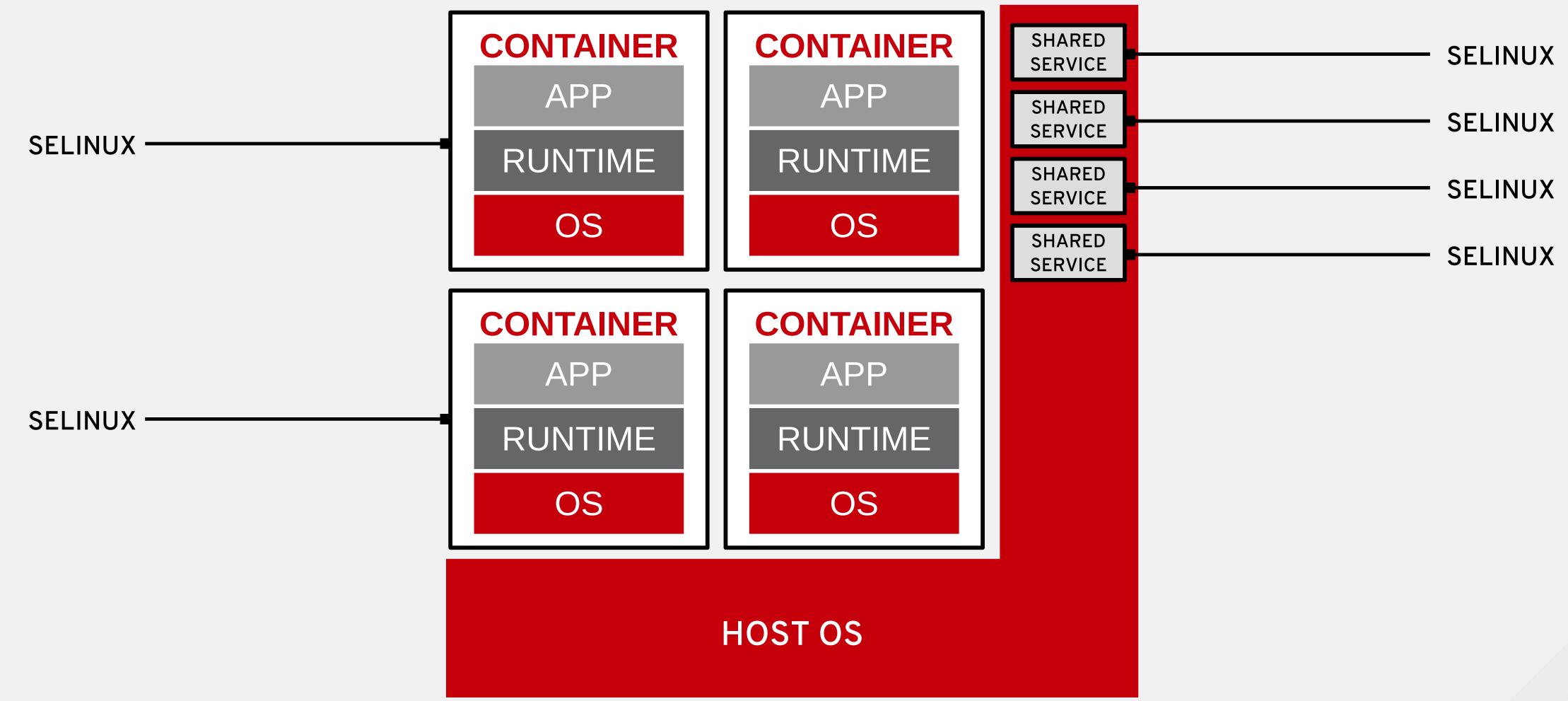


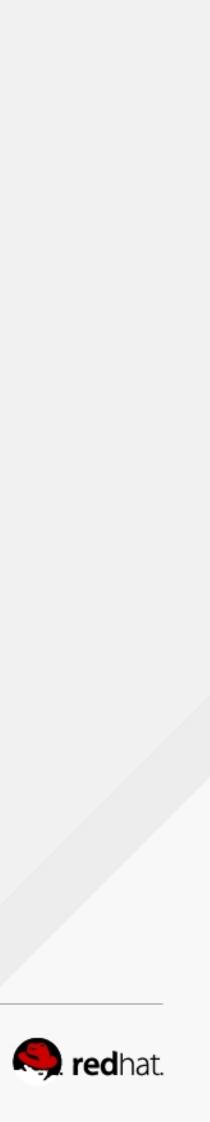
CONTAINER ISOLATION



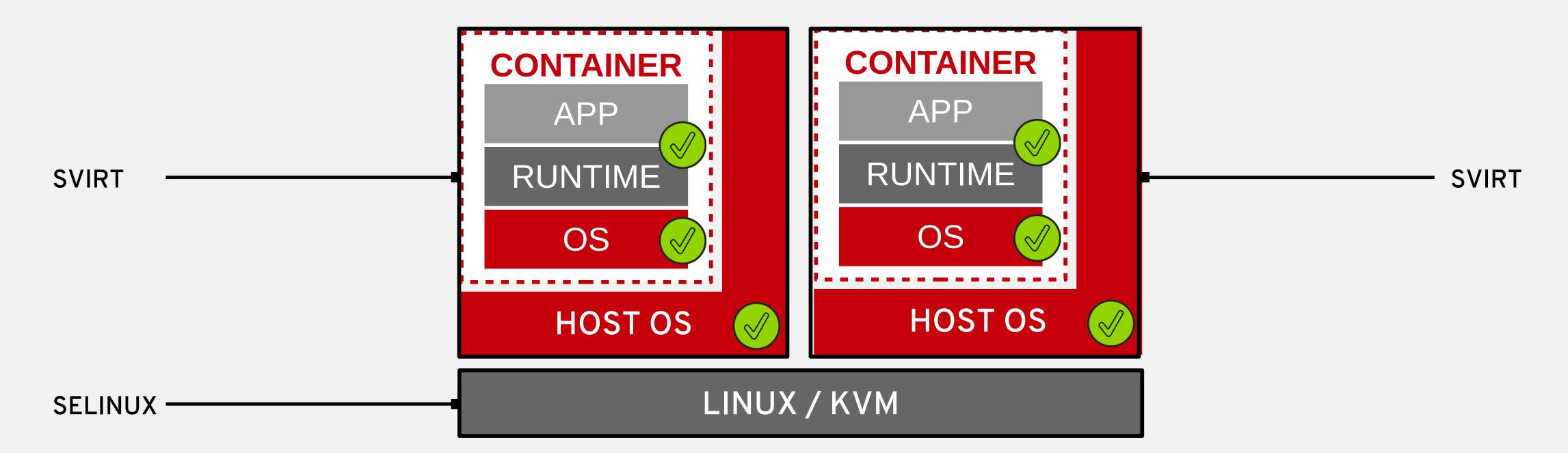


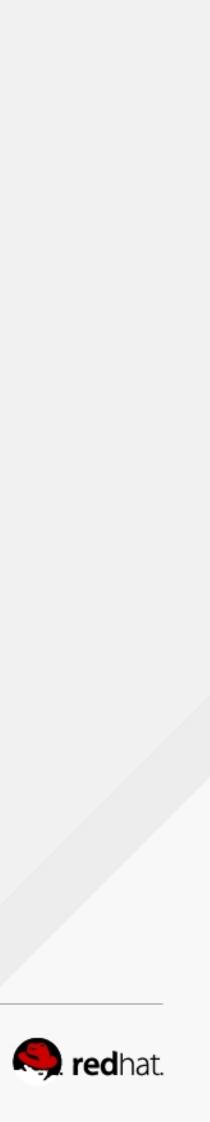
CONTAINER ISOLATION WITH SELINUX



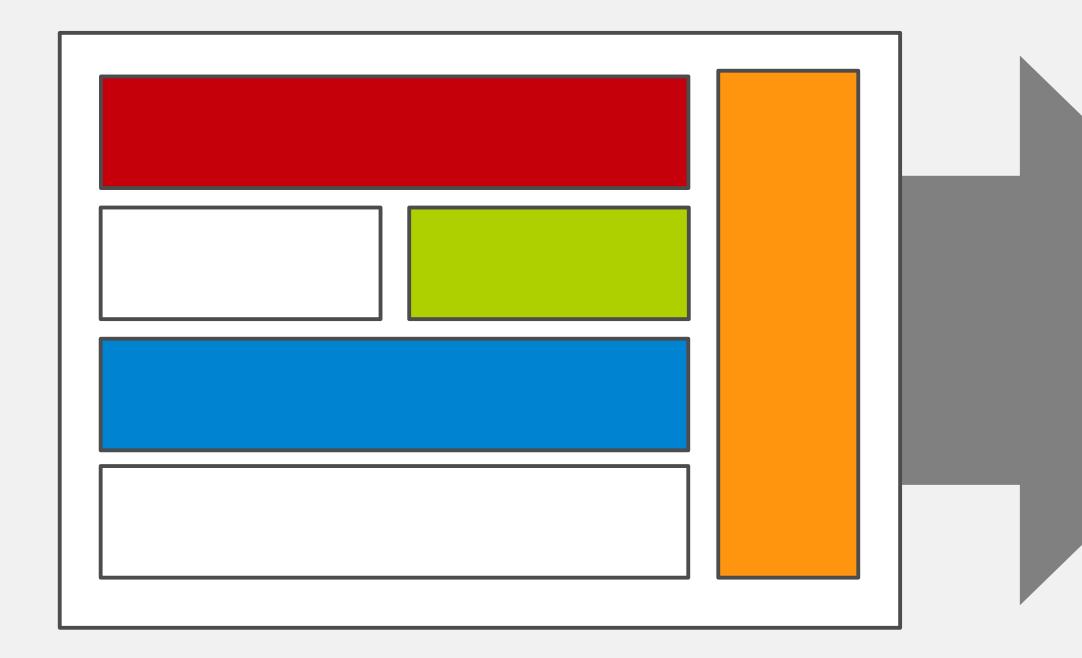


VM ISOLATION WITH SELINUX



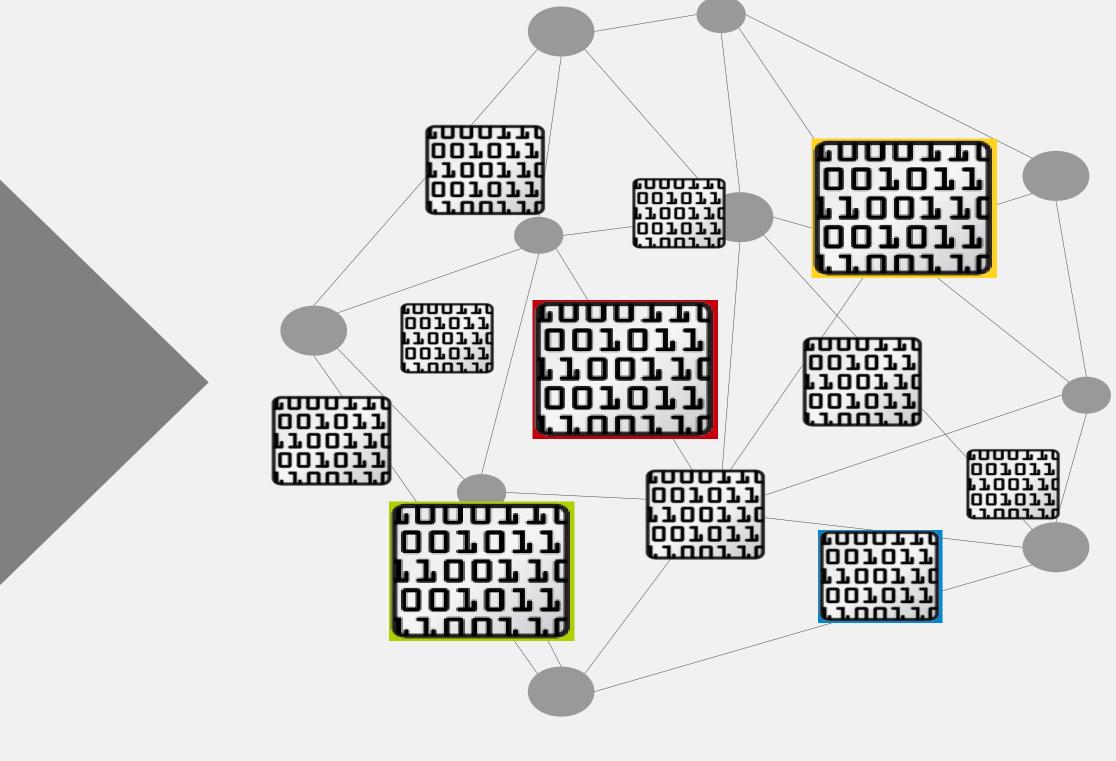


NOT ALL APPLICATIONS ARE SIMPLE

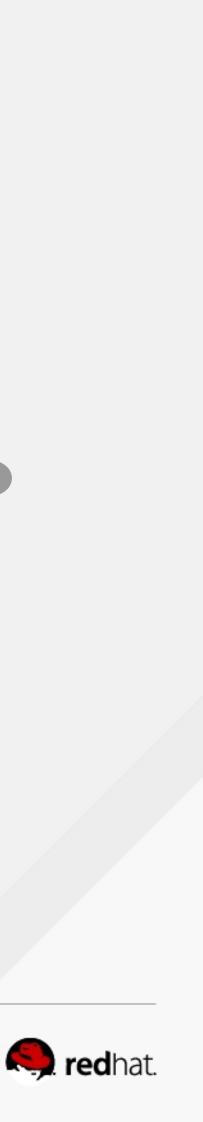


MONOLITHIC/LAYERED

Multi-container applications are the norm, not the exception



MICROSERVICES



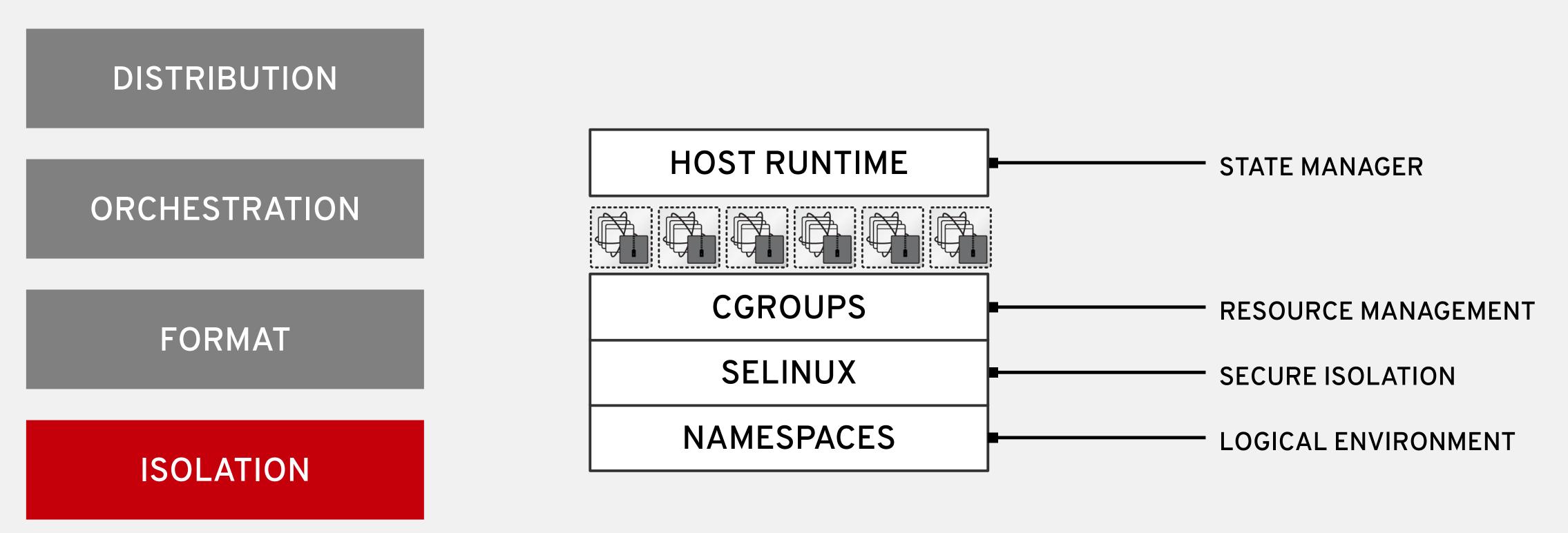
COMPLEXITY OF CONTAINERS AT SCALE

CONTAINERIZING THE DATACENTER REQUIRES PLANNING



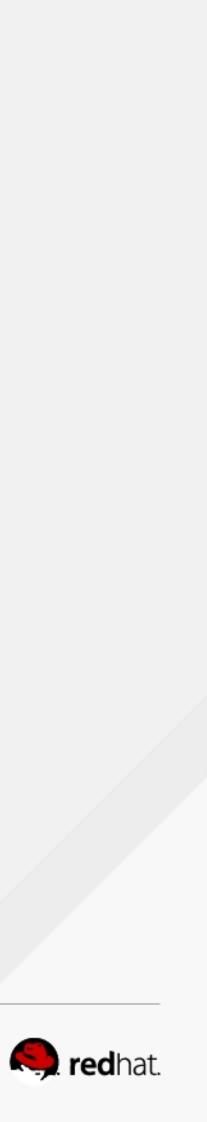
Organizations need a secure and reliable foundation on which they can run and orchestrate multi-container based applications at scale





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Driving standards for containerization in four key areas



CONTAINER FORMAT

DISTRIBUTION

ORCHESTRATION

FORMAT

ISOLATION

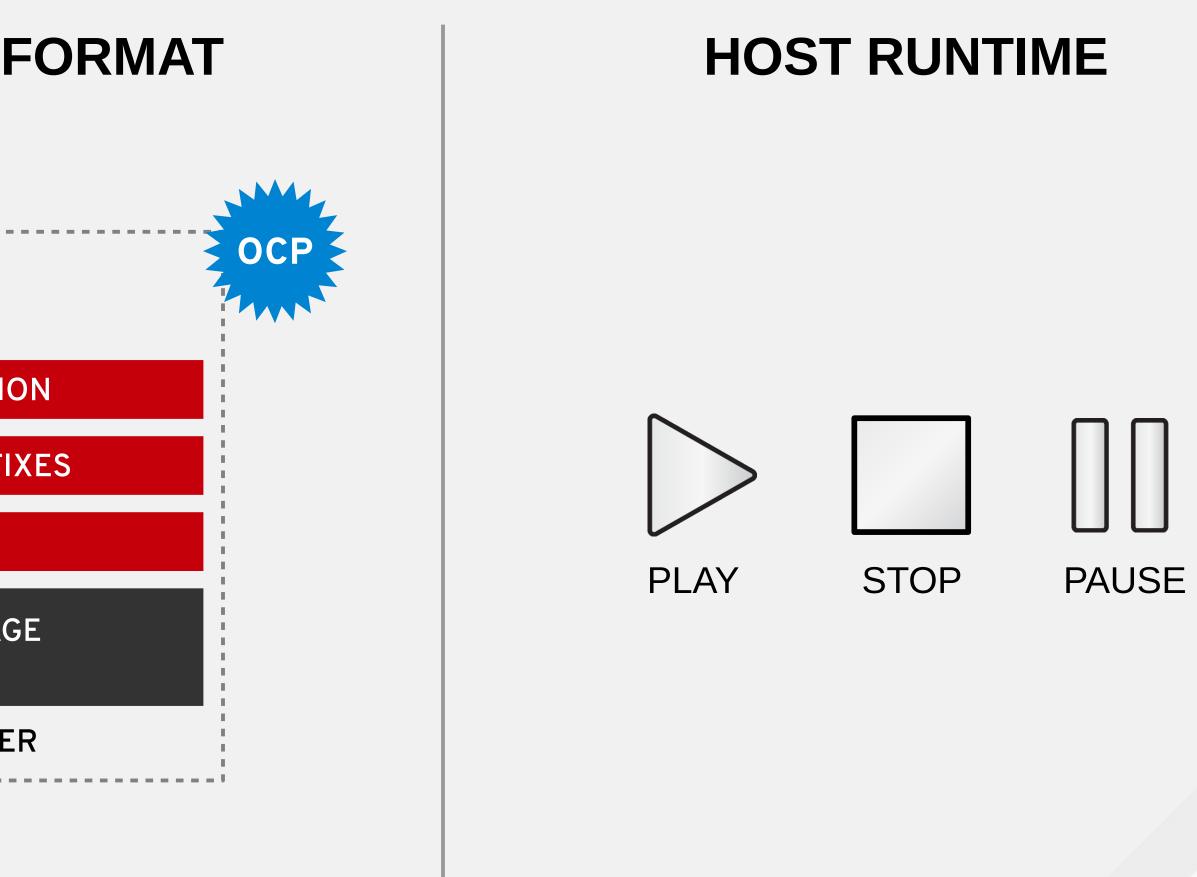
APPLICATION

SECURITY FIXES

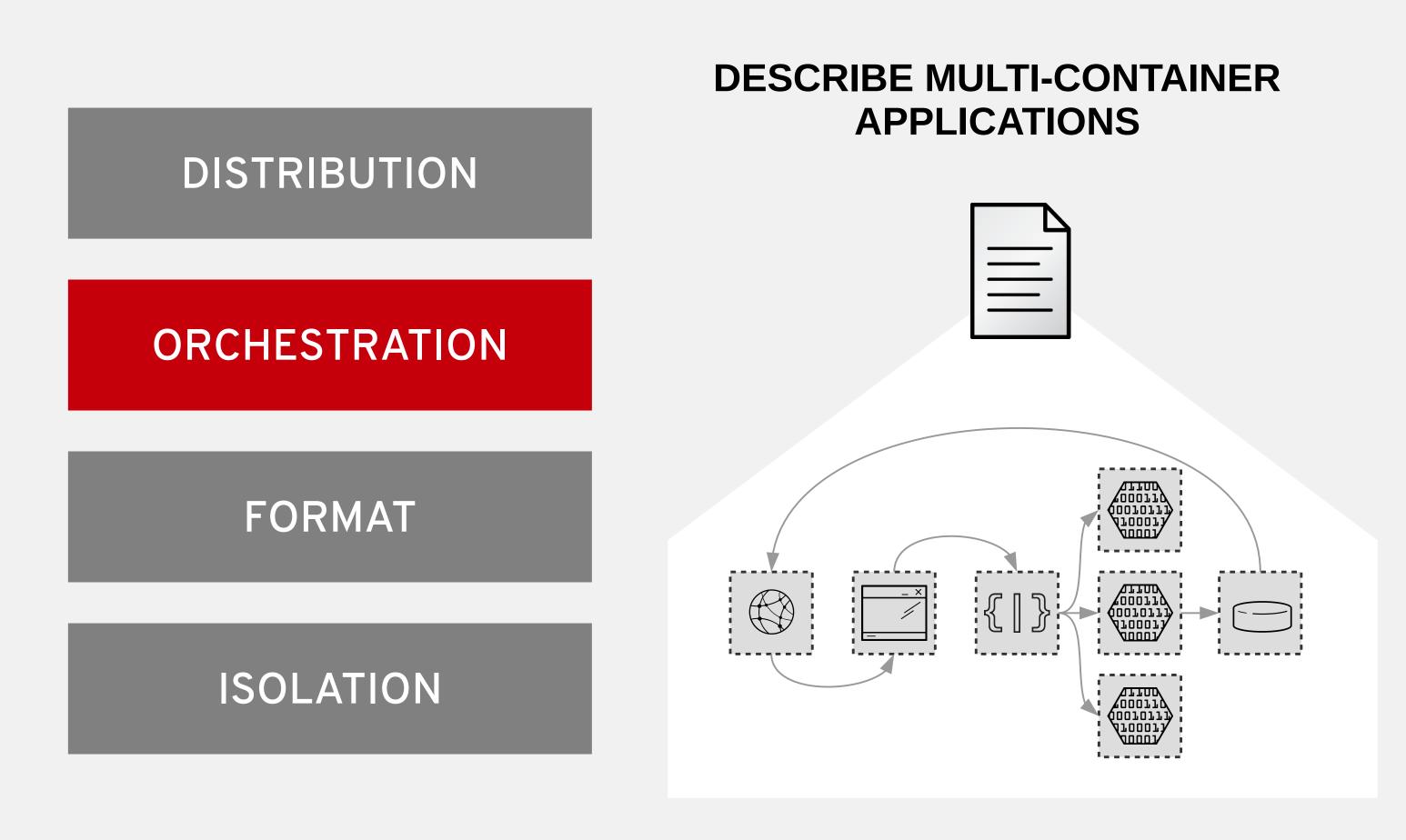
JAVA

BASE IMAGE RHEL7

CONTAINER

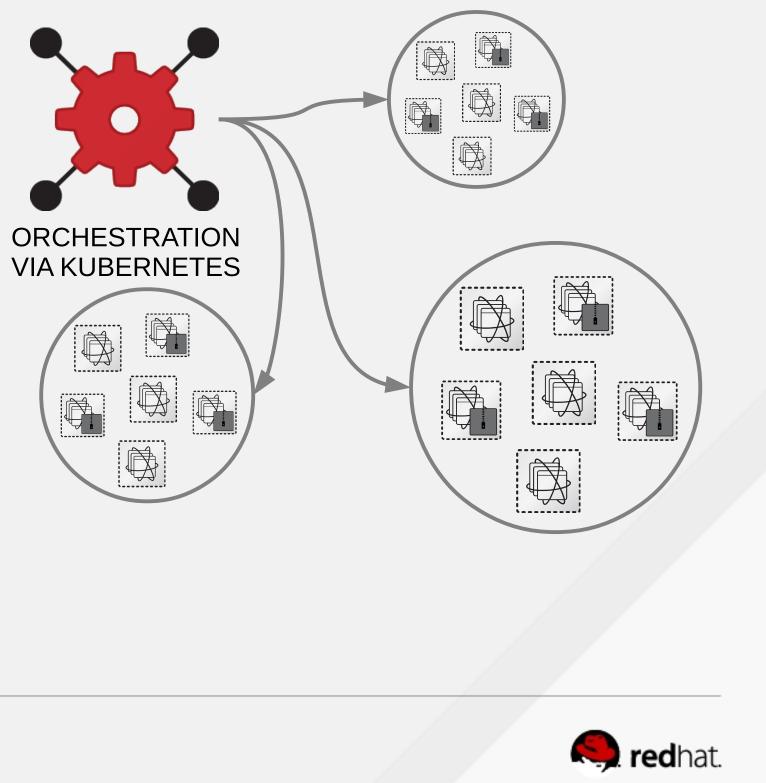






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TRANSPARENT ORCHESTRATION ACROSS CONTAINER HOSTS







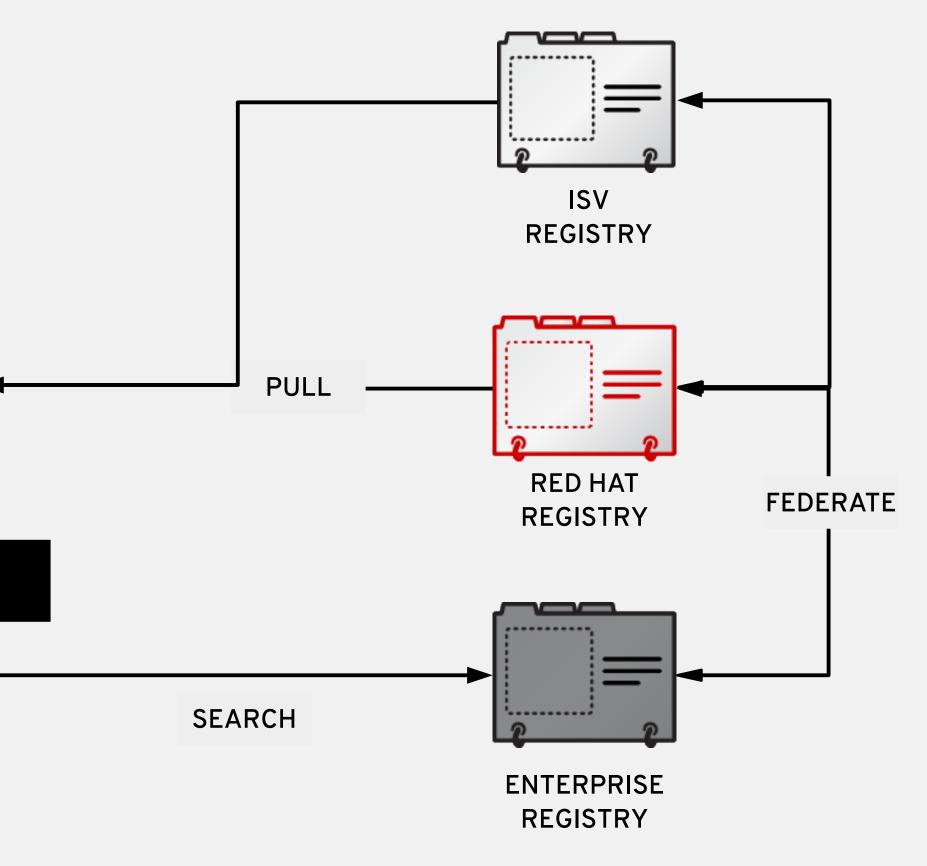
DISTRIBUTION

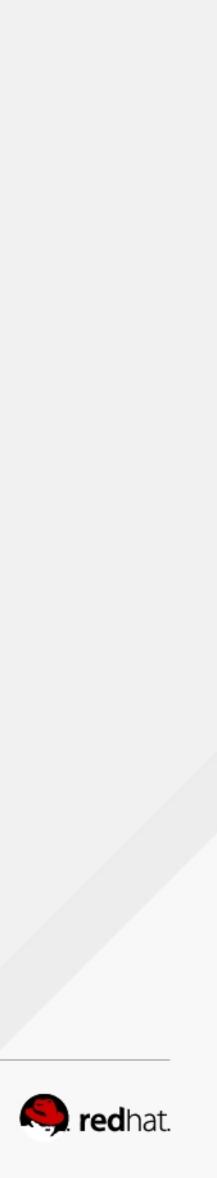
ORCHESTRATION

FORMAT

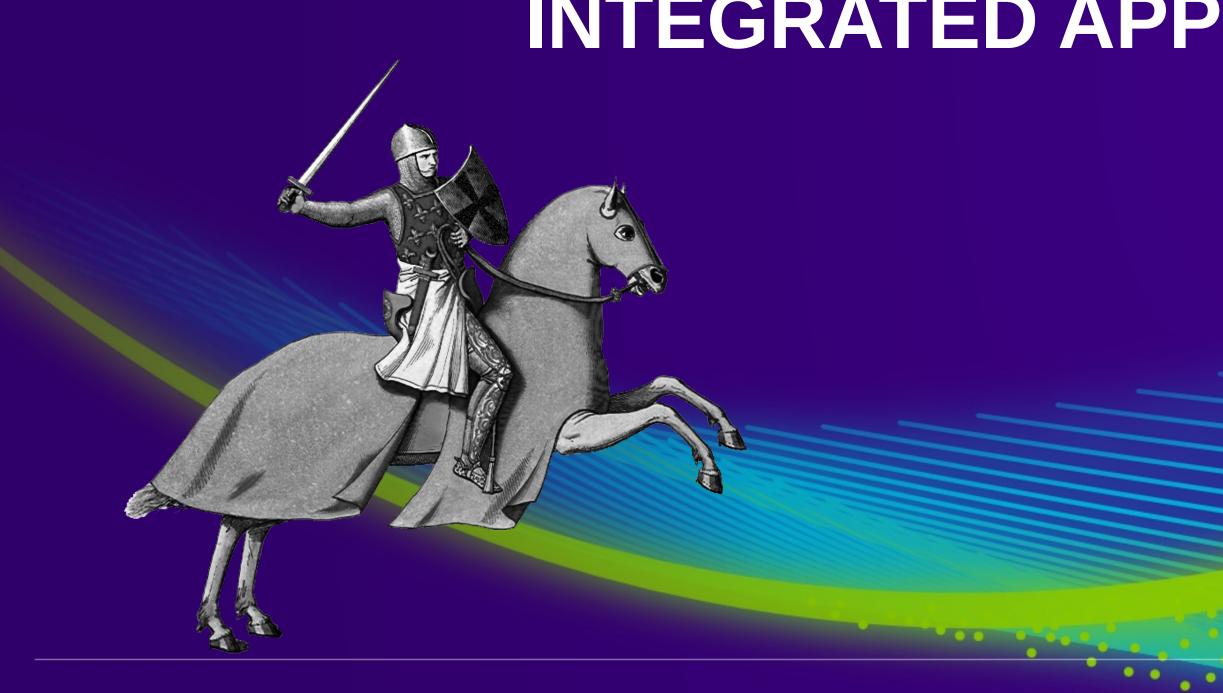
Docker search foo

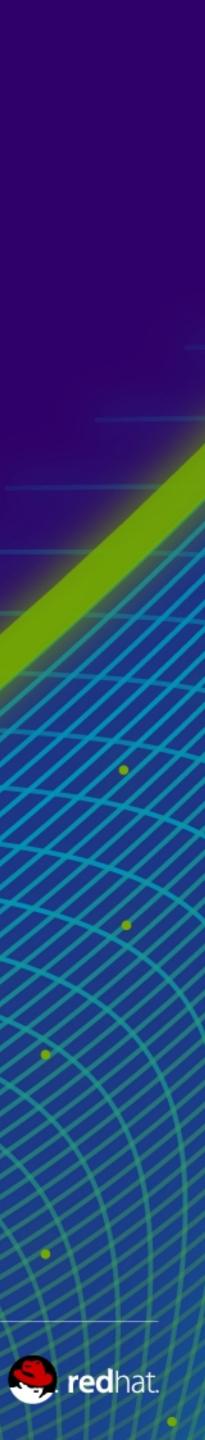
ISOLATION





INTEGRATED APPLICATION DELIVERY





ATOMIC APPLICATION ARCHITECTURE

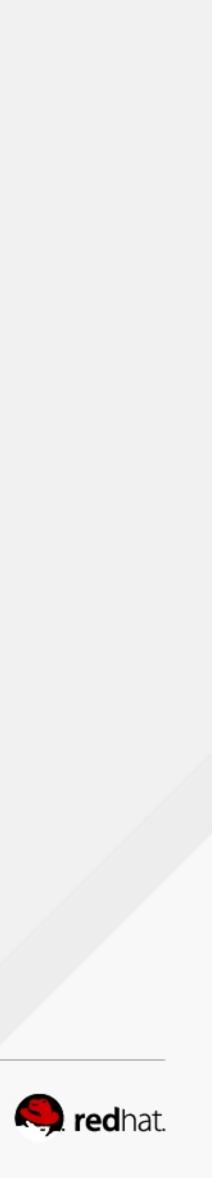
ATOMIC Immutable Separation of Concerns Anotated LIGHTWEIGHT Not Configured



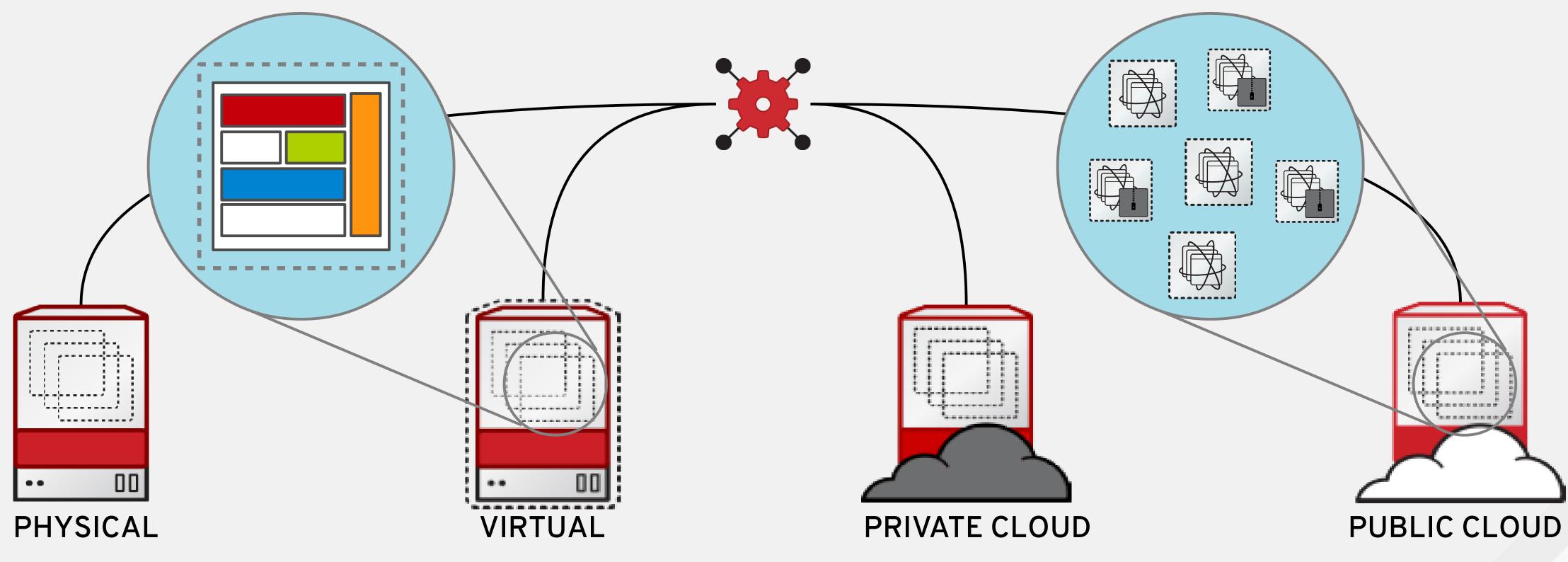


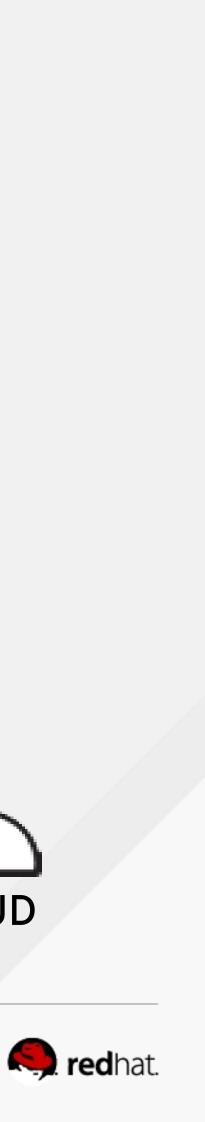
ELASTIC Distributed Cluster is the Computer SERVICE AGGREGATION Dynamic Location Awareness



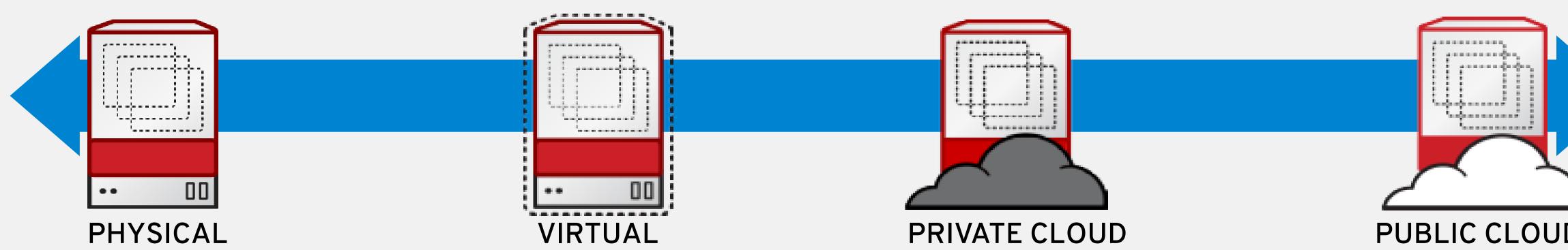


CONSISTENT ACROSS TRADITIONAL AND CLOUD-READY APPLICATIONS





PROVEN APPLICATION PORTABILITY



portability across platforms

RED HAT ENTERPRISE LINUX ATOMIC HOST

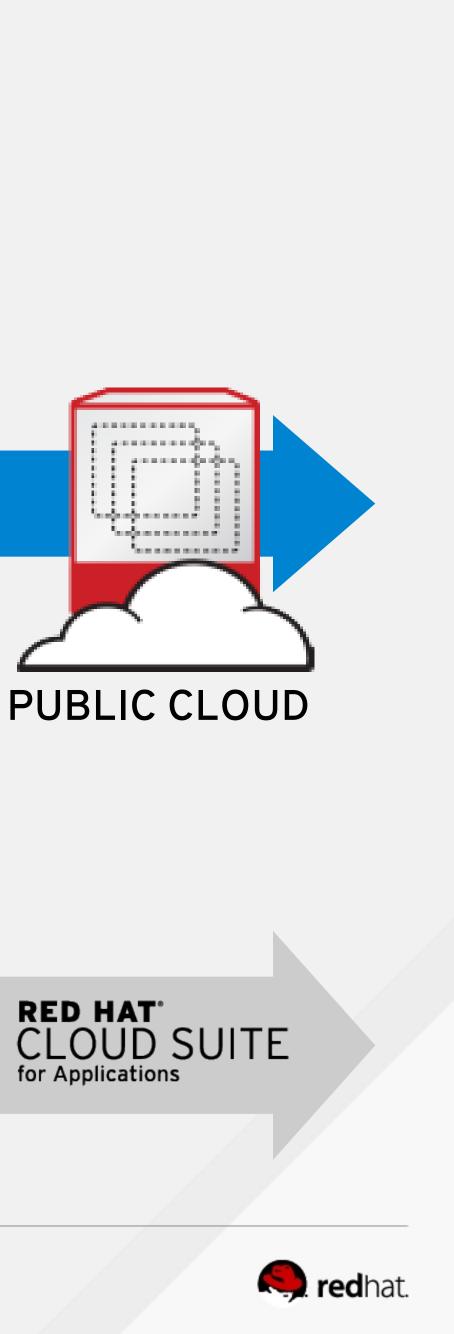
RED HAT ATOMIC ENTERPRISE PLATFORM

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portability across environments

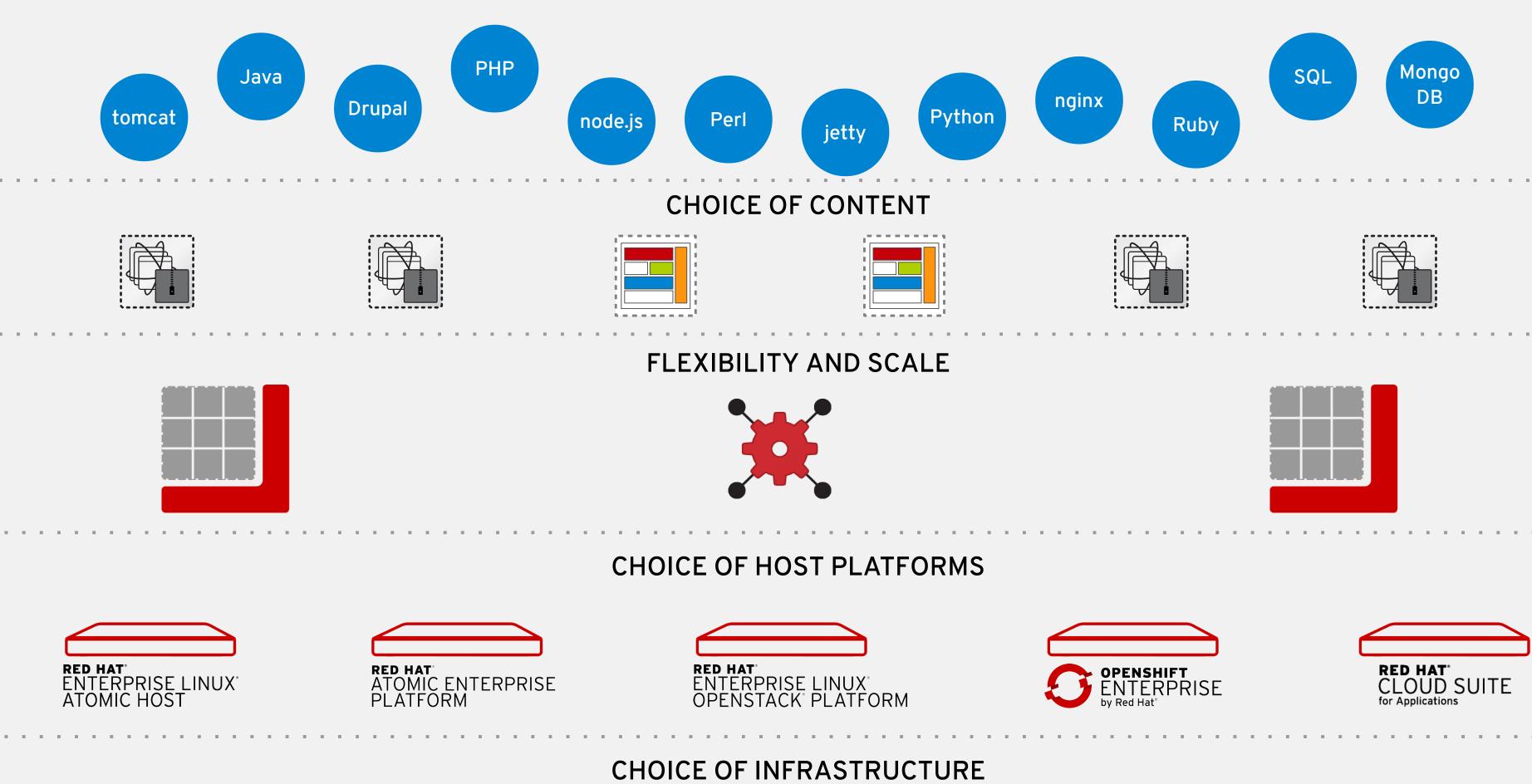








ATOMIC APPLICATION ARCHITECTURE

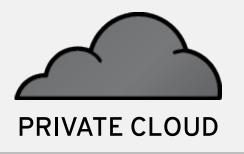


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PHYSICAL

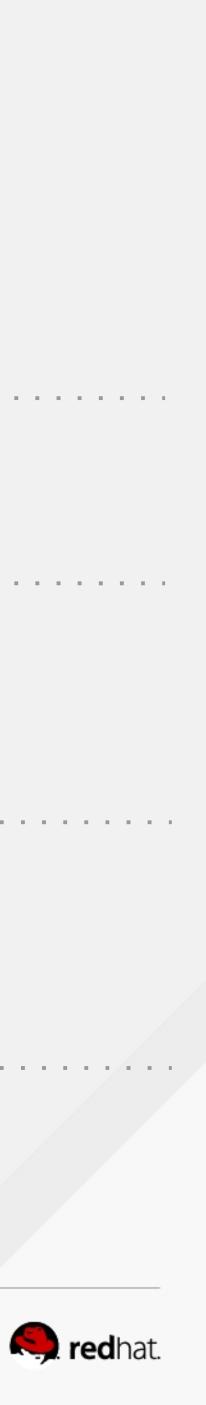
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VIRTUAL

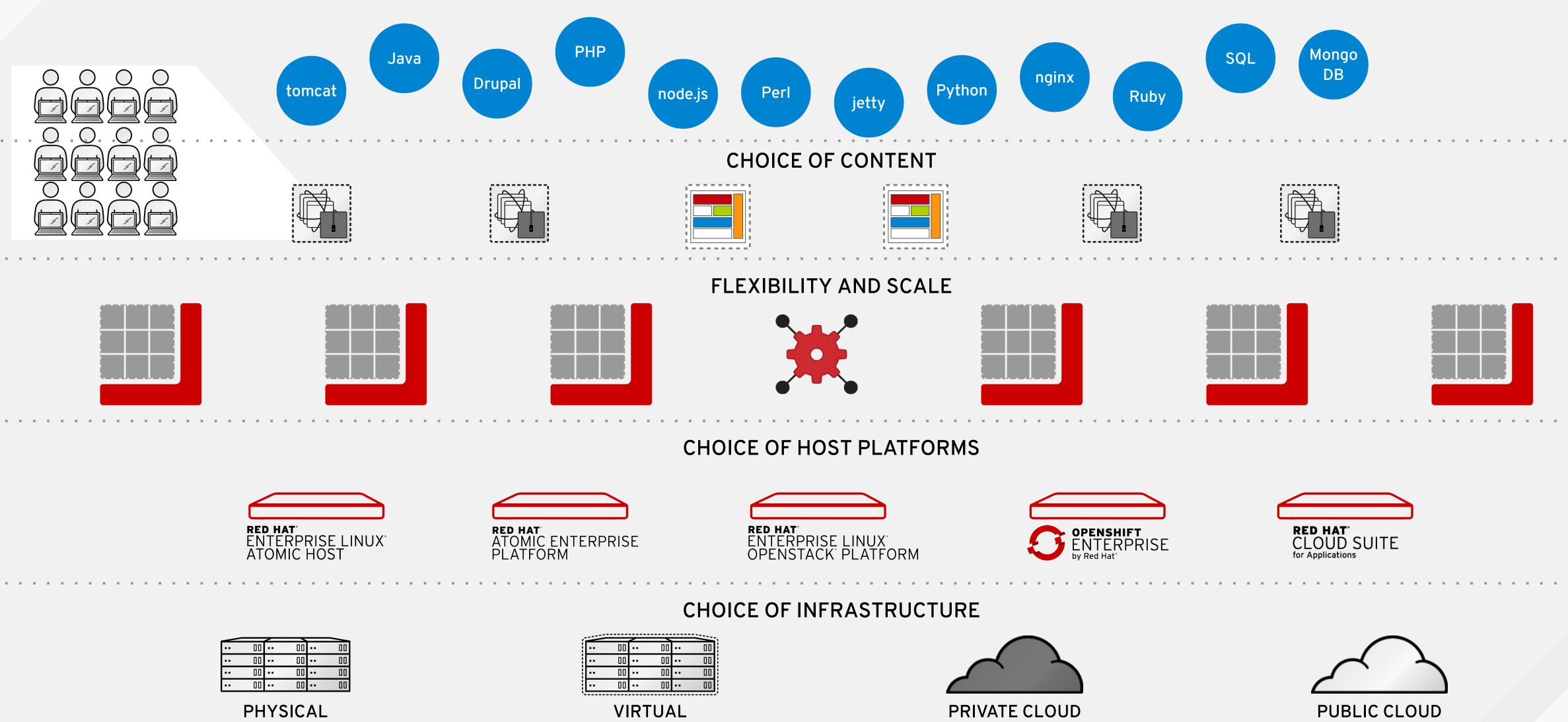


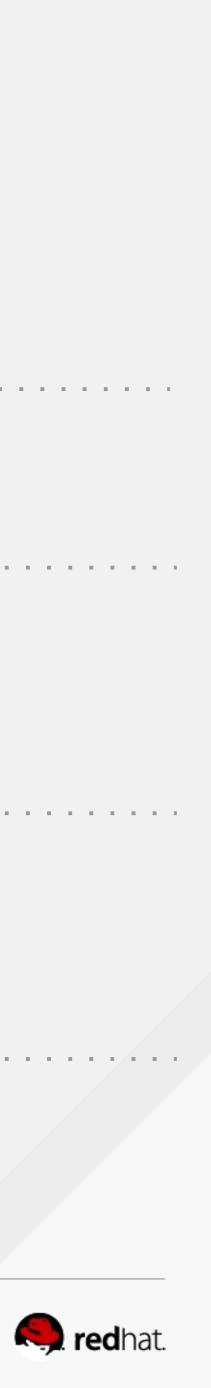




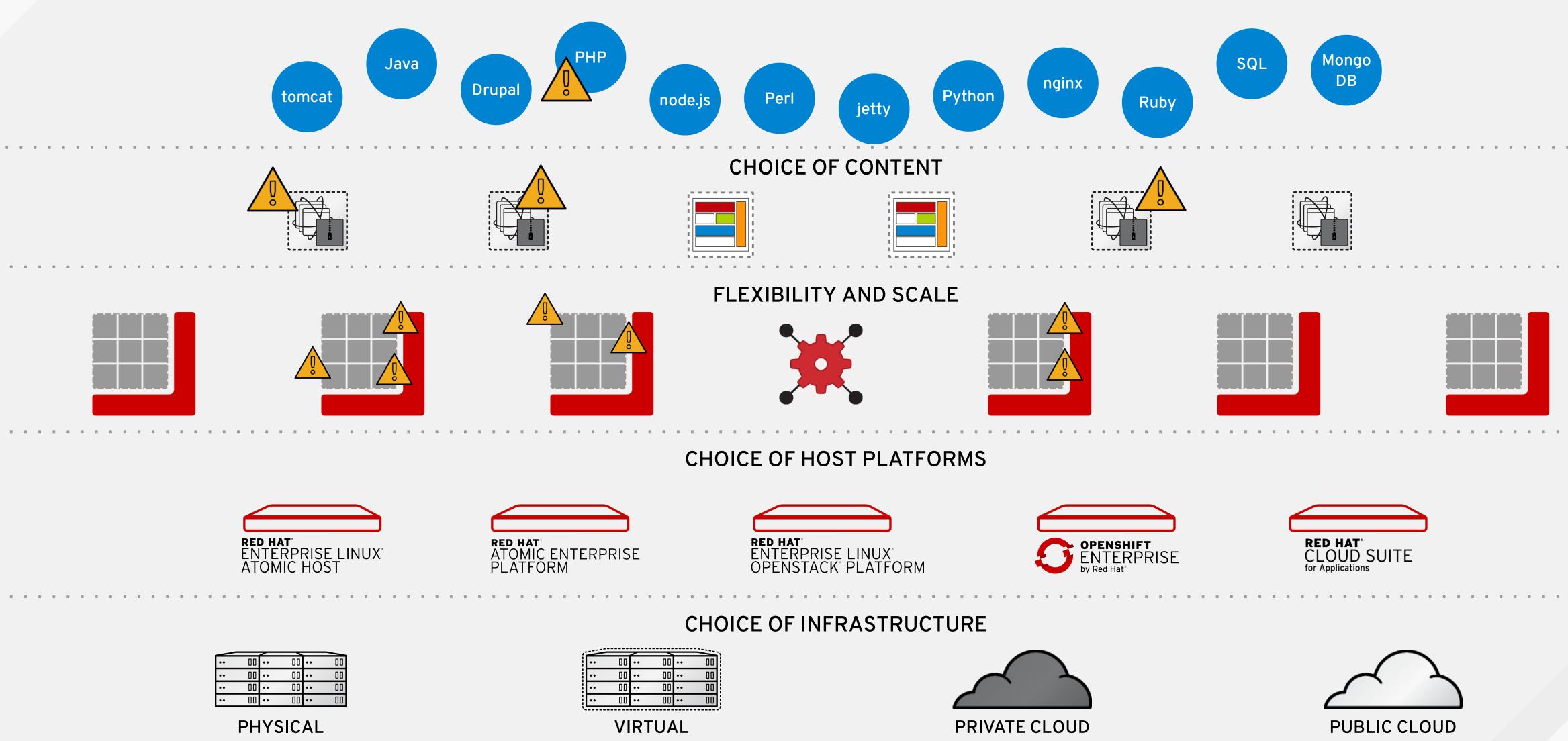


ATOMIC APPLICATION ARCHITECTURE

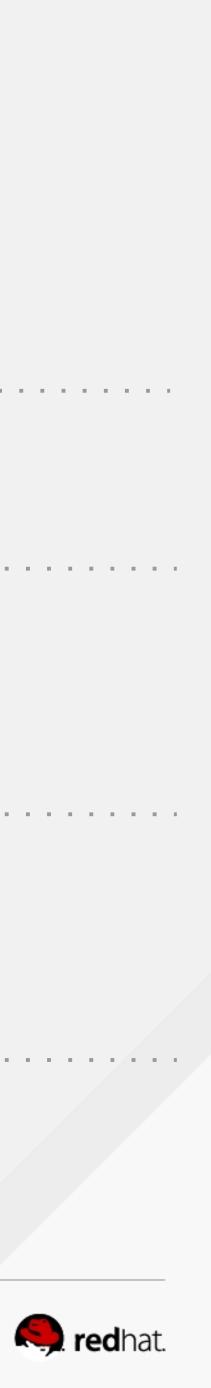




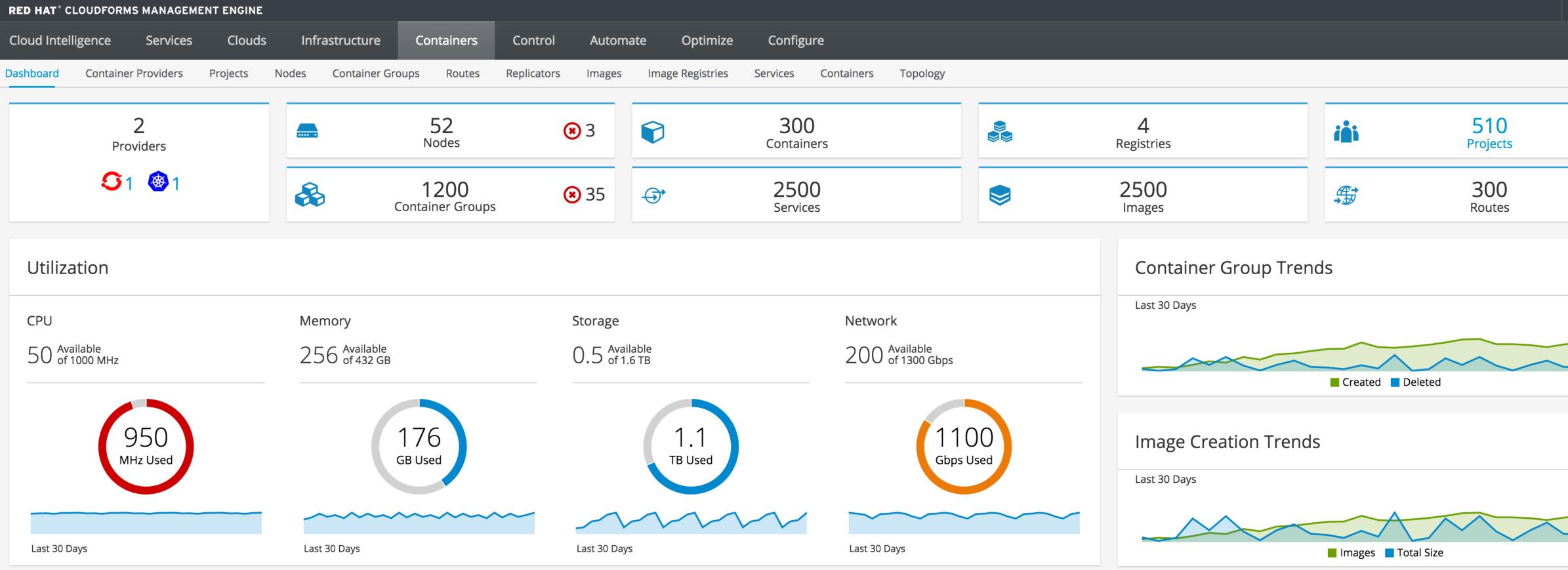
ATOMIC APPLICATION ARCHITECTURE





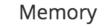


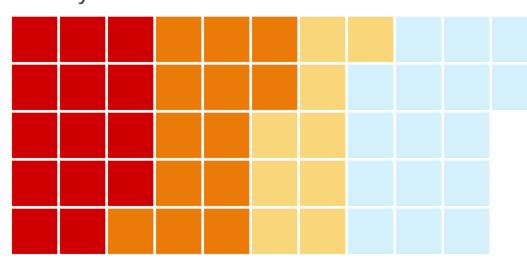
ADMINISTRATION & CONTAINER MANAGEMENT

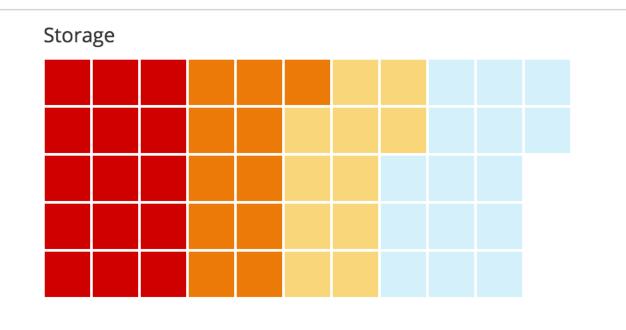


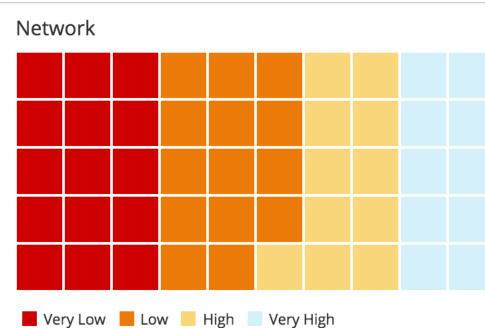
CPU

Utilization By Nodes

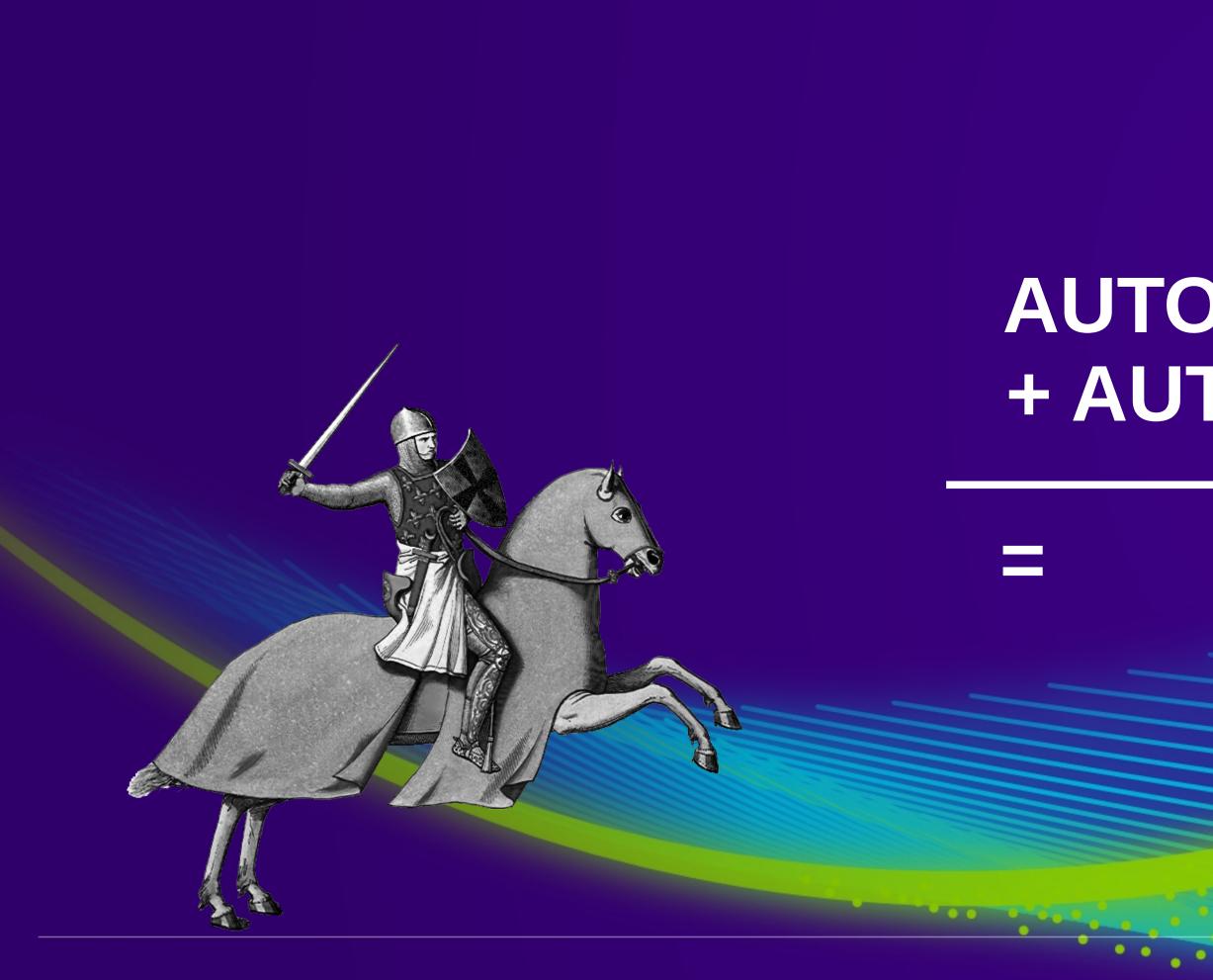








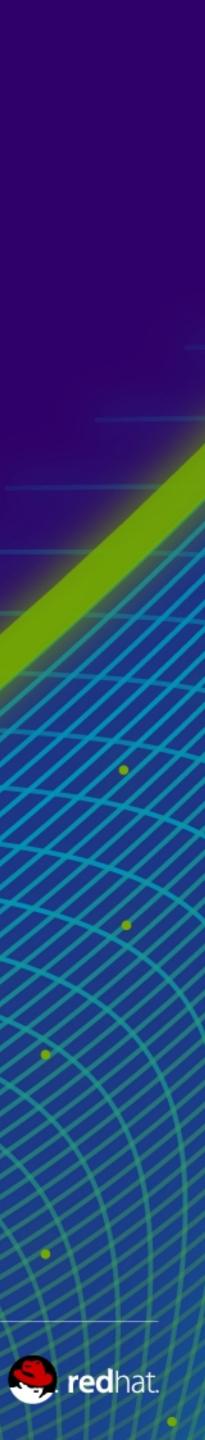
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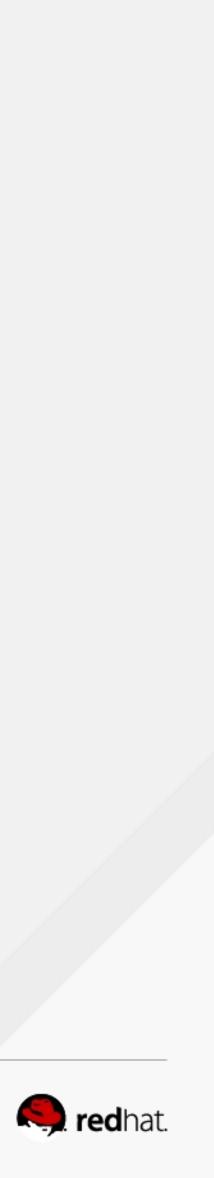
AUTOMATION + AUTONOMY

AGILITY



LEVELS OF ABSTRACTION

PACKAGED SOFTWARE	INFRASTRUCTURE AS A SERVICE	PLATFORM AS A SERVICE	
applications	applications	applications	
data	data	data	
middleware	middleware	middleware	
runtimes	runtimes	runtimes	
security	security	security	
operating system	operating system	operating system	
virtualization	virtualization	virtualization	
server hardware	server hardware	server hardware	
storage	storage	storage	
networking	networking	networking	
MANAGED BY YOU	MANAGED BY SOLUTION		



CONVERGENCE OF IAAS AND PAAS

INFRASTRUCTURE AS A SERVICE

applications

data

runtimes

security

middleware

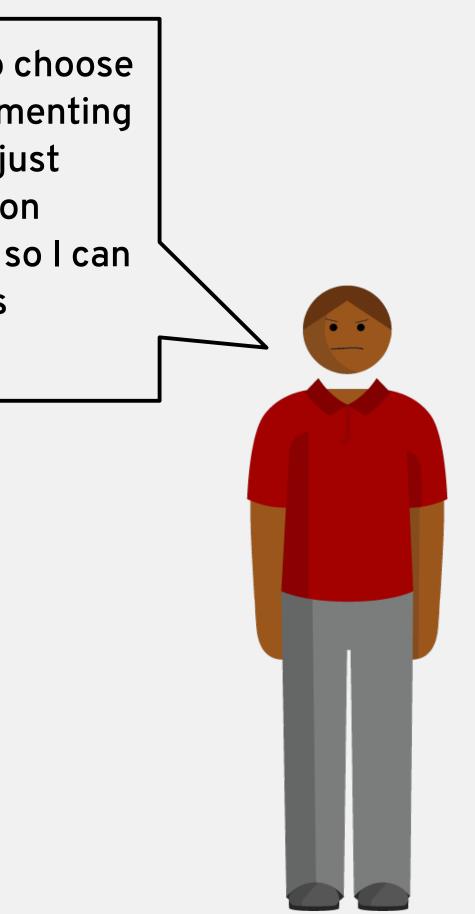
operating system

abstract from underlying hardware resources "I don't want to choose between implementing laaS or PaaS. I just want abstraction where I need it so I can focus on what's important."

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MANAGED BY YOU



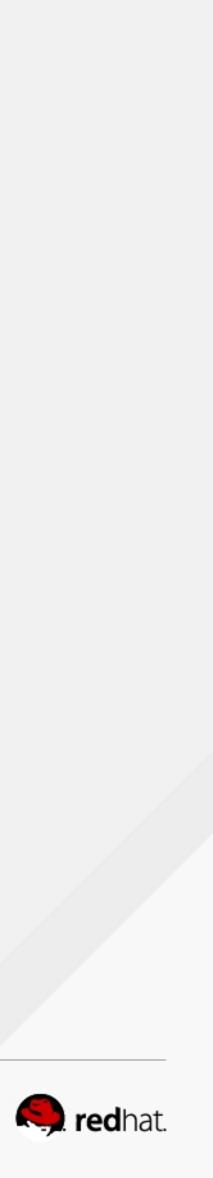


PLATFORM AS A SERVICE

applications

data

abstract from underlying hardware, software, and application resources



REDEFINE AUTONOMY

INFRASTRUCTURE **AS A SERVICE**

applications

data

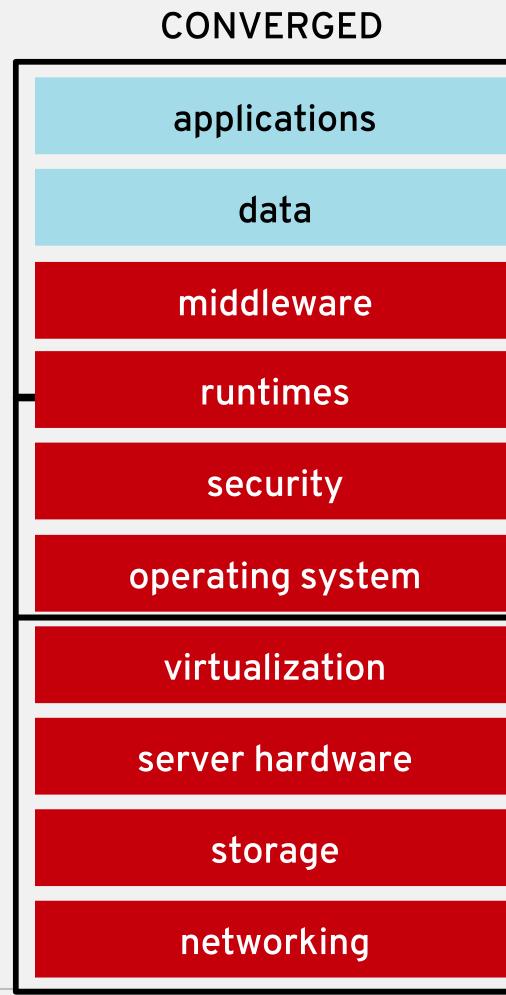
runtimes

security

middleware

operating system

abstract from underlying hardware resources



MANAGED BY SOLUTION

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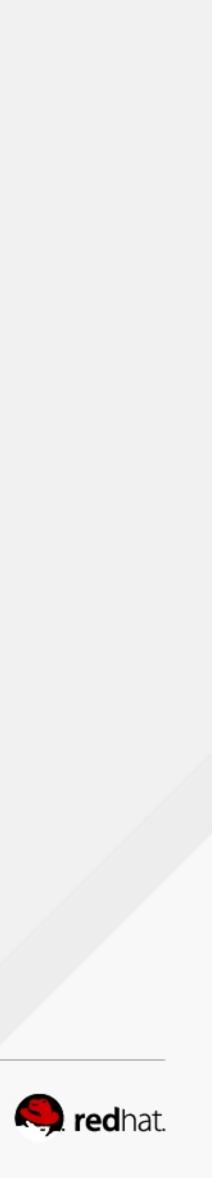
MANAGED BY YOU

PLATFORM AS A SERVICE

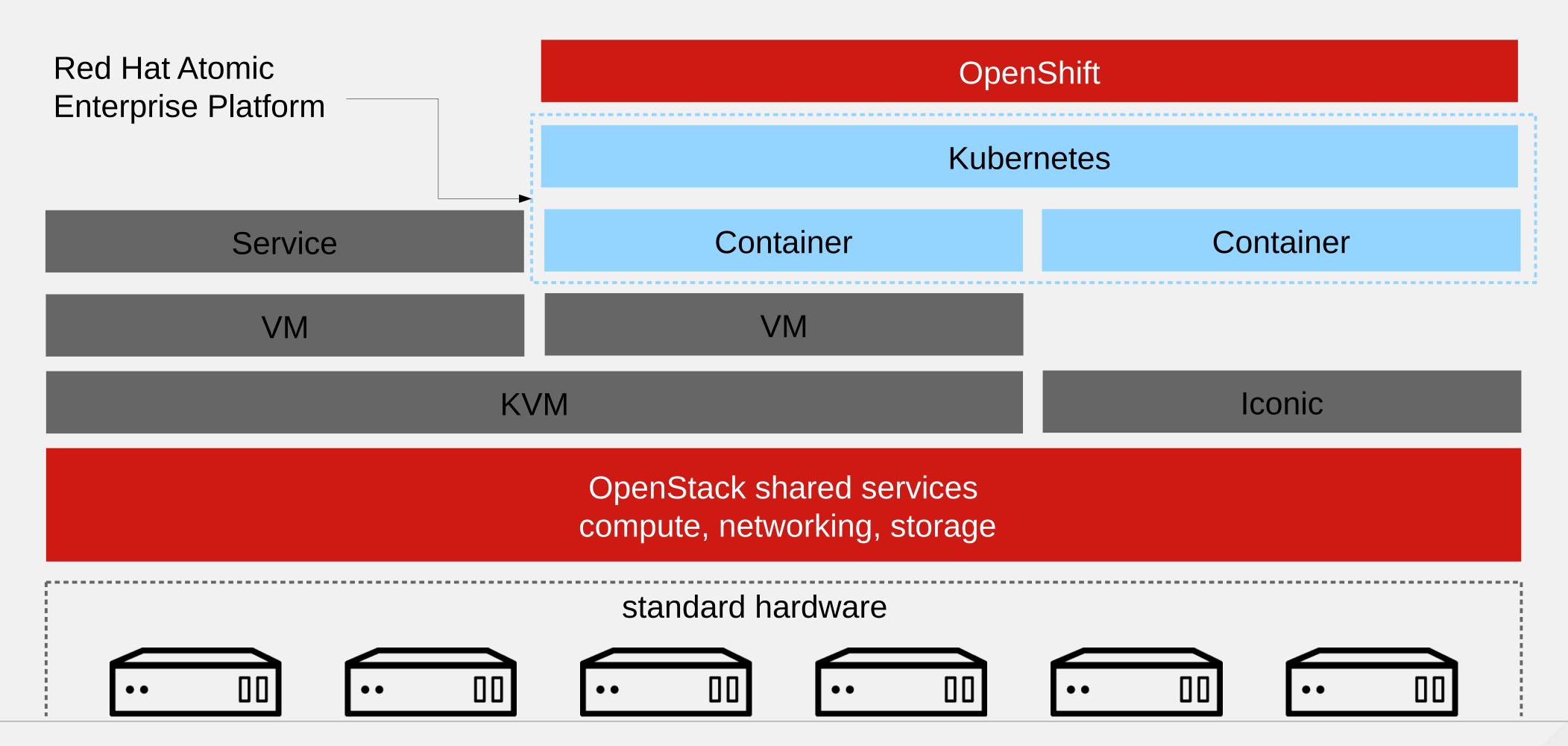
applications

data

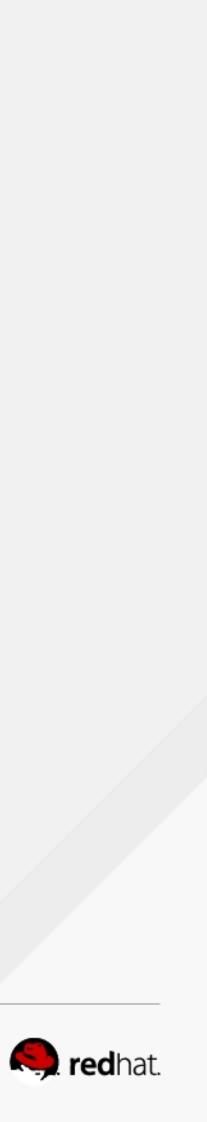
abstract from underlying hardware, software, and application resources



CONVERGENCE OF IAAS AND PAAS PHYSICAL AND APPLICATION ABSTRACTION







A continuum of solutions to develop, run, and manage container-based applications

RED HAT[®] ATOMIC ENTERPRISE PLATFORM

Deployment platform for Ops

DevOps platform for container development and deployment

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OPENSHIFT ENTERPRISE by Red Hat[®]

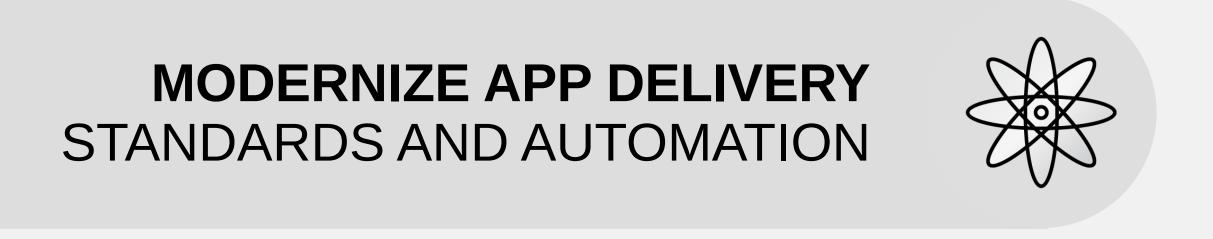
RED HAT[®] CLOUD SUITE for Applications

Managed platform for traditional and cloud-native applications in containers and VMs

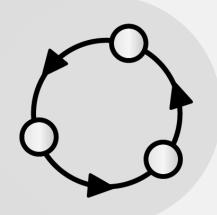


RED HAT CONTAINER SOLUTIONS

Develop, run, and manage container-based applications at scale



CONSISTENCY **DEV, TEST, AND PRODUCTION**





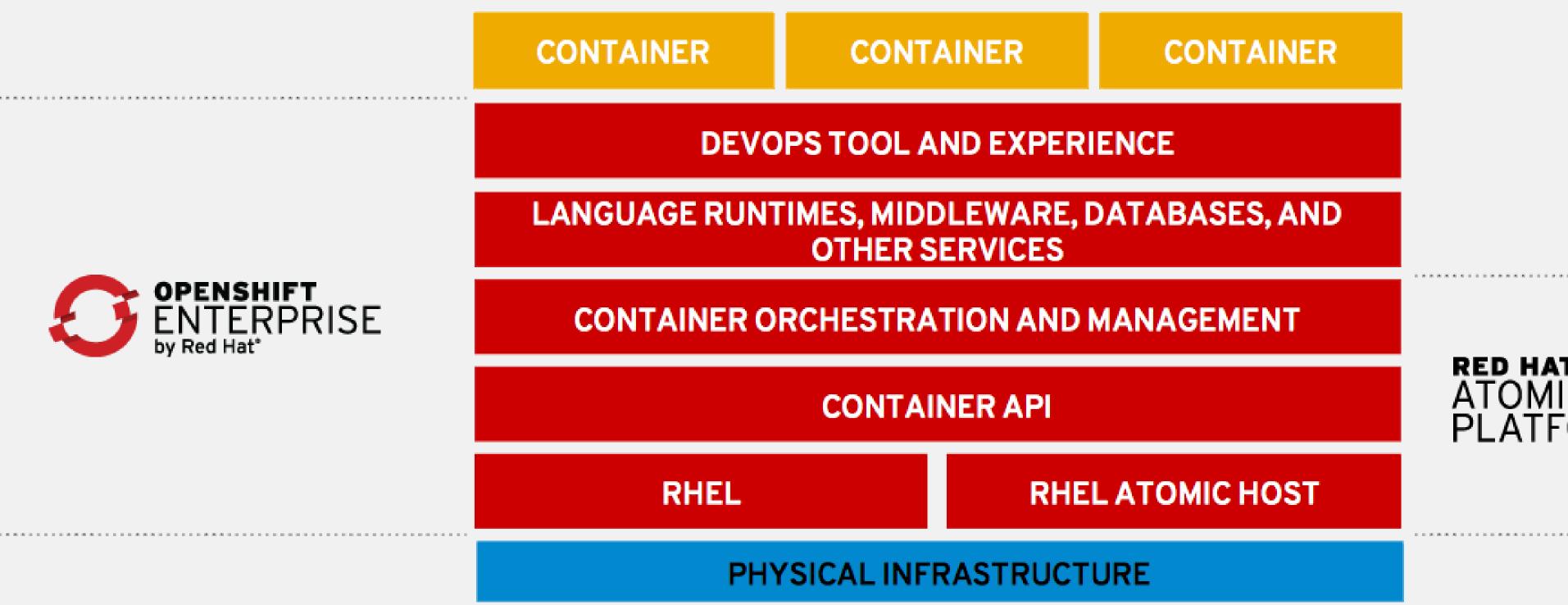






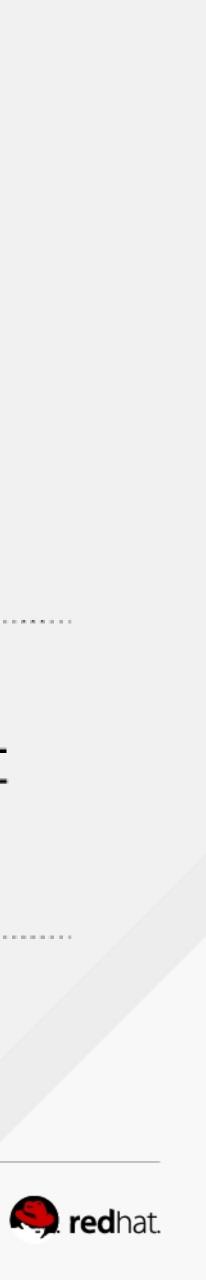


RED HAT ATOMIC ENTERPRISE PLATFORM AND OPENSHIFT 3



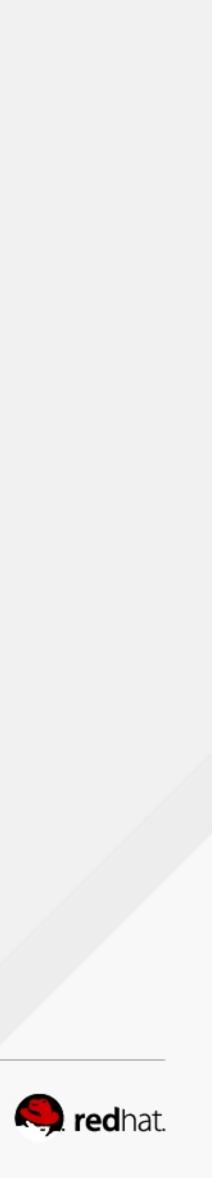
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RED HAT" ATOMIC ENTERPRISE PLATFORM



RED HAT ENTERPRISE LINUX, INCLUDING ATOMIC HOST

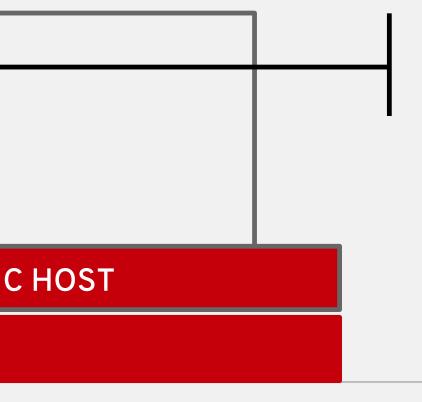
CERTIFIED HARDWARE ECOSYSTEM



RED HAT[®] ATOMIC ENTERPRISE PLATFORM Managed cluster of container-optimized hosts Orchestration and service aggregation

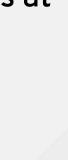
RED HAT ENTERPRISE LINUX, INCLUDING ATOMIC HOST

CERTIFIED HARDWARE ECOSYSTEM

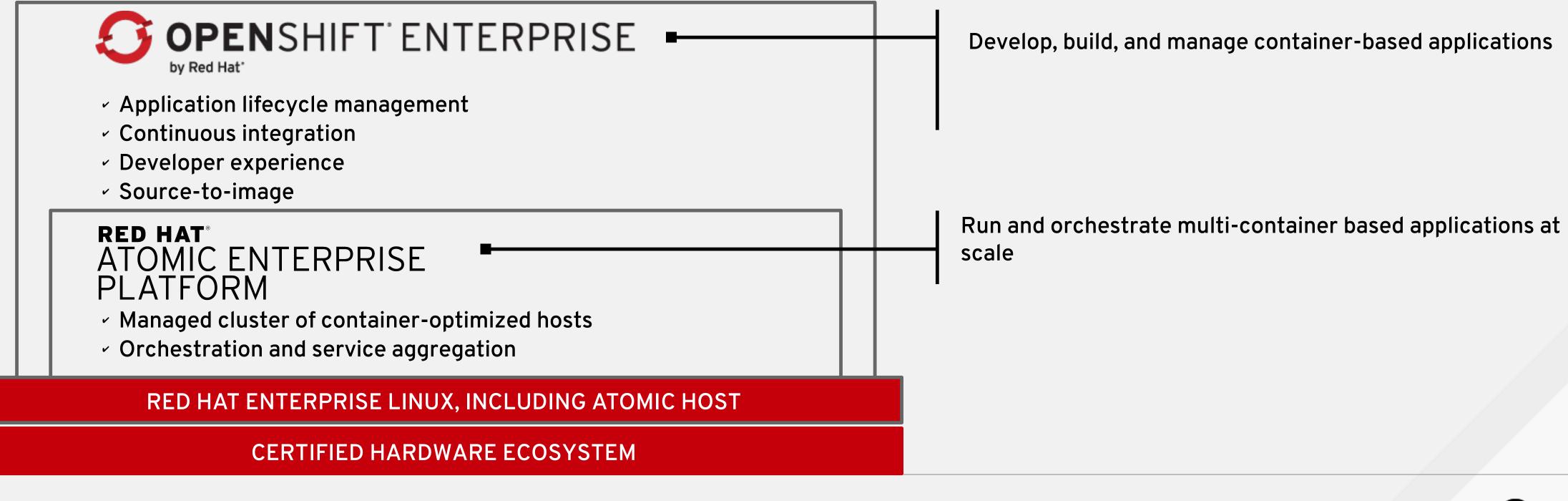


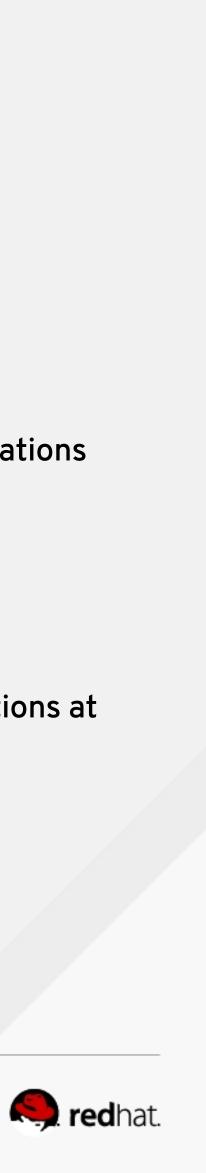
Run and orchestrate multi-container based applications at scale

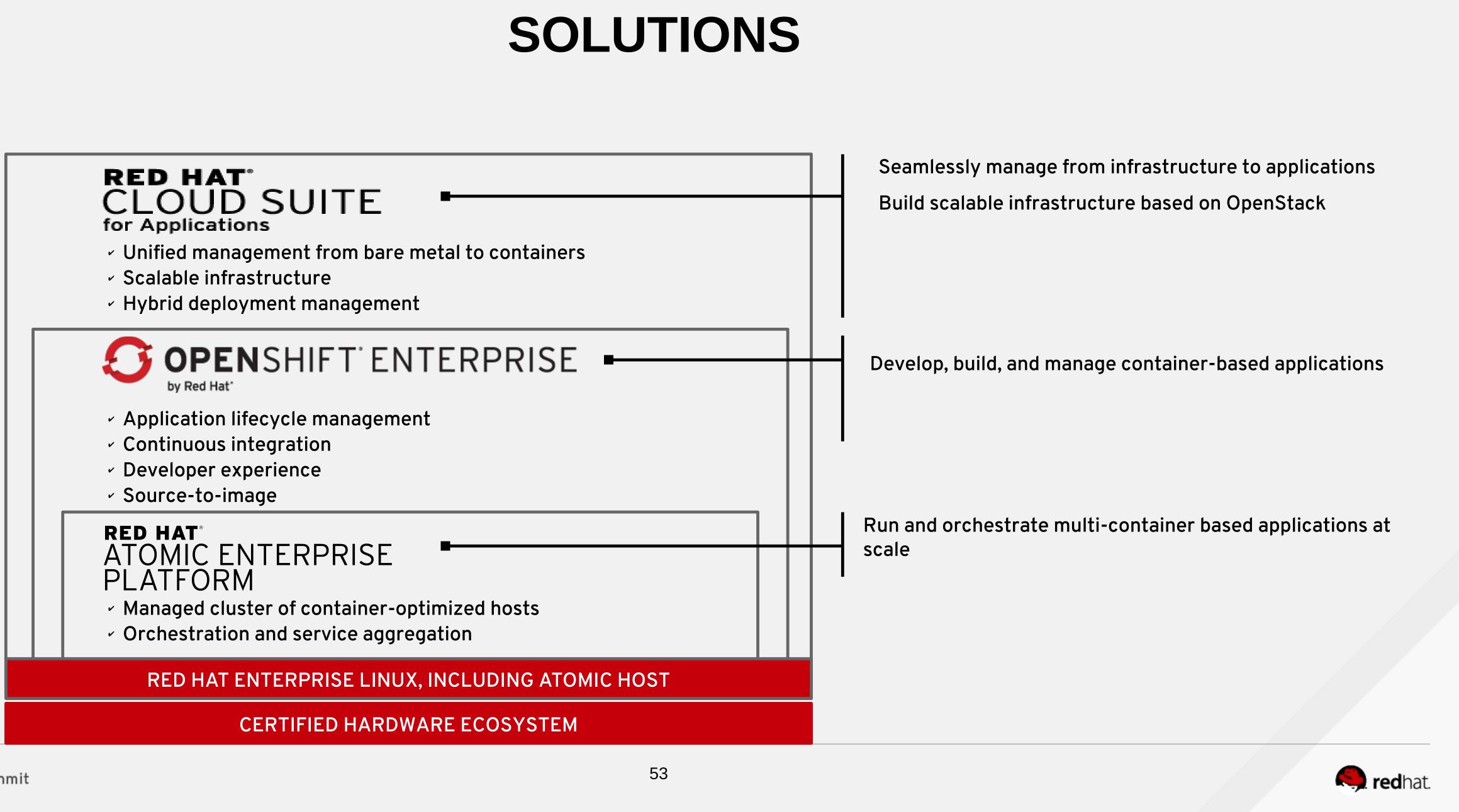


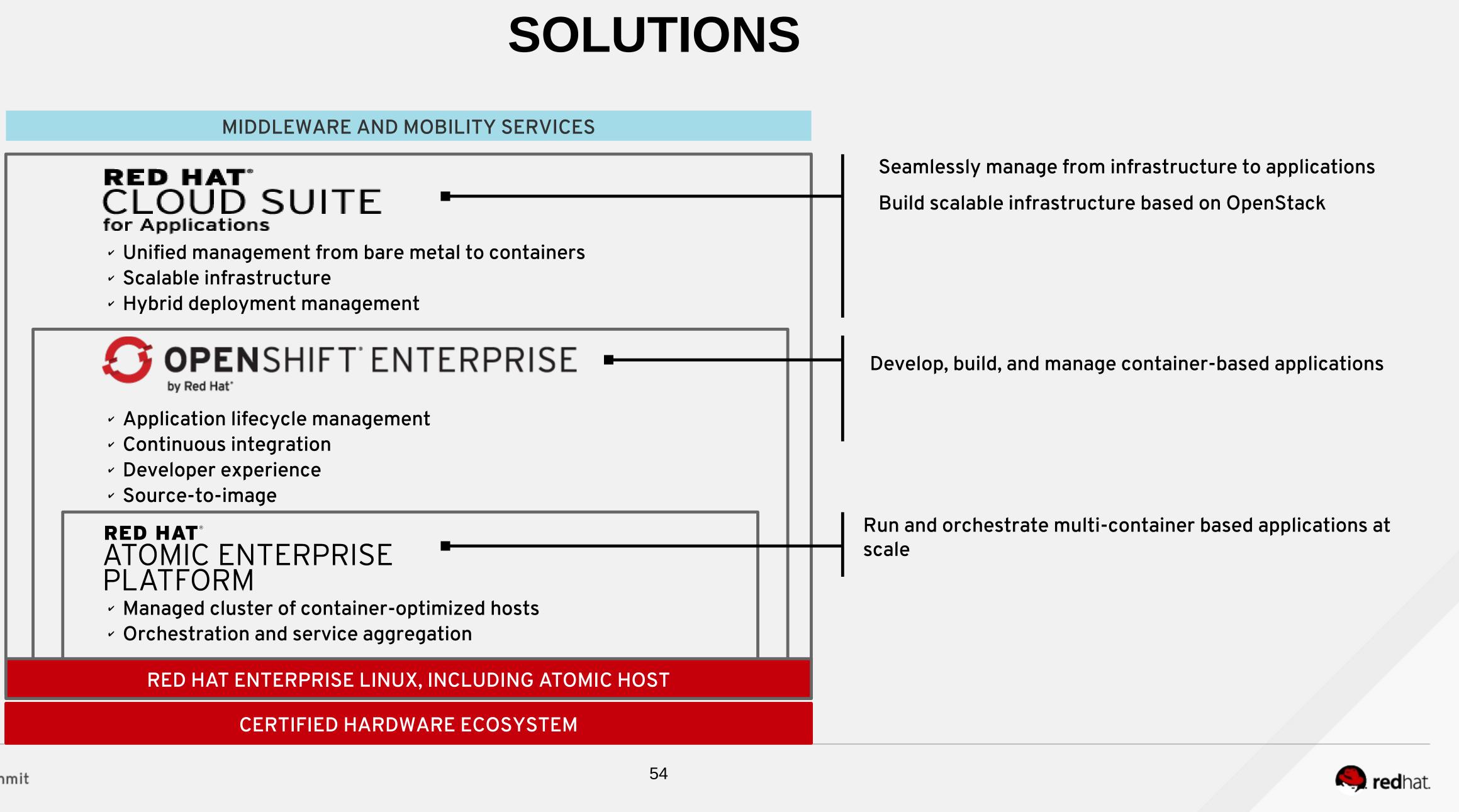




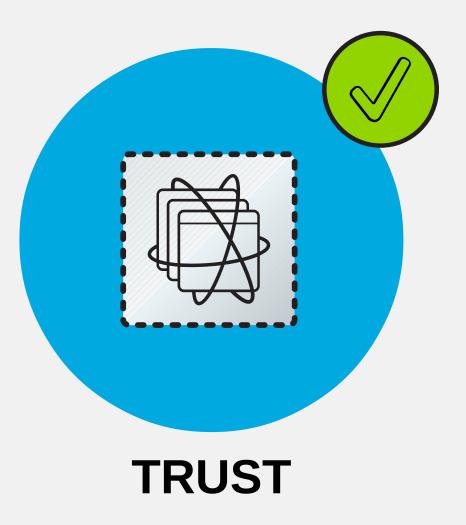






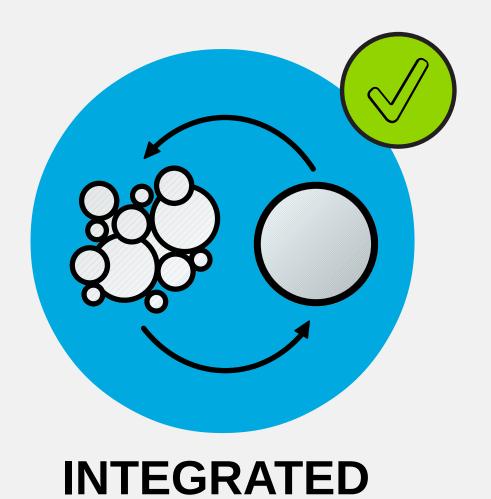


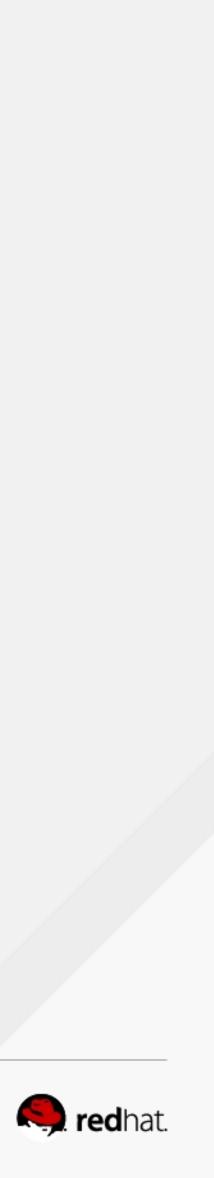
RED HAT'S CONTAINER STRATEGY





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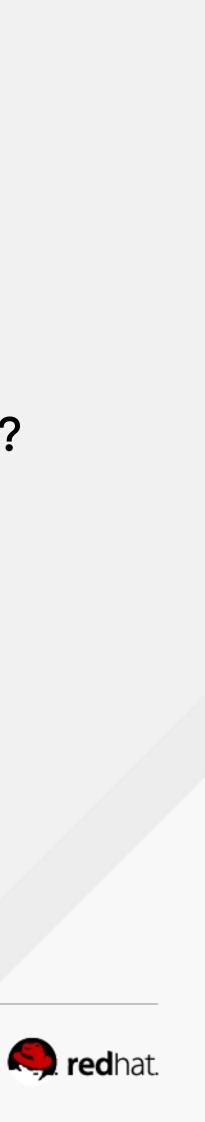
LEARN MORE ABOUT CONTAINERS

- Related sessions:
 - Thursday, 10:40 am 11:40 am: Container management at Red Hat

 - Thursday, 1:20 pm 2:20 pm: Red Hat Enterprise Linux 7 Atomic Host special interest group panel Thursday, 1:20 pm - 2:20 pm: Atomic architectures & containerized, application-centric IT - Thursday, 2:30 pm - 3:30 pm: Operating and managing an Atomic container-based infrastructure - Thursday, 3:40 pm - 4:40 pm: Container security: Do containers actually contain? Should you care?

 - Thursday, 4:50 pm 5:50 pm: Red Hat's container roadmap
- Hands-on labs:

 - Thursday, 10:30 am 12:30 pm : Hands-on Red Hat Enterprise Linux Atomic Host - Friday, 9:00 am - 11:00 am: Containerizing applications, existing and new
- Demonstrations:
 - Booth #306 in the Partner Pavilion

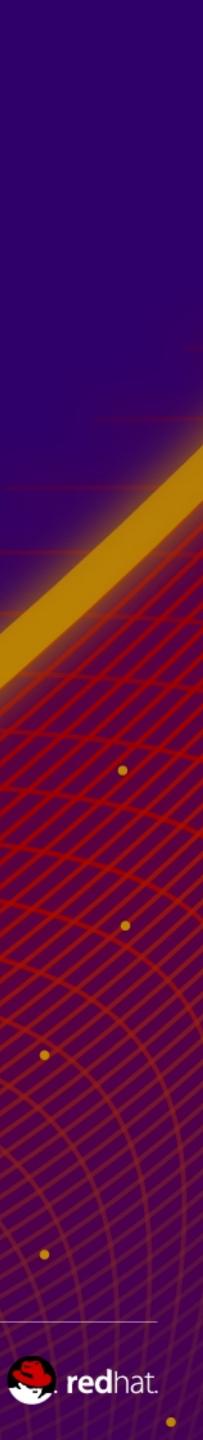




LEARN. NETWORK. EXPERIENCE OPEN SOURCE.

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