HYBRID IS THE NEW CLOUD STANDARD

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MARKET LANDSCAPE FOR HYBRID CLOUD
CHANGE IN THE CLOUD IS HAPPENING EVERYWHERE

PRIVATE CLOUD

PUBLIC CLOUD

TELCO CLOUD

EDGE CLOUD
HYBRID CLOUD IS REAL AND GROWING

Nearly 62% have or will have multiple cloud environments

How will organizations use different cloud environments in the next 2 years?

- Will focus primarily on a single cloud environment
- Will have multiple "different" cloud environments, but little-to-no interoperability between the environments
- Will have multiple cloud environments to migrate workloads or data between cloud environments
- Will have multiple cloud environments where the delivery of a single business function across the different cloud environments is seamless

Source: 451 Research Voice of the Enterprise, Cloud Transformation Q1 2017
HYBRID CLOUD CHALLENGES

HYBRID CLOUD CHALLENGES

LEGACY APPLICATIONS | APPLICATION PORTABILITY | LACK OF AUTOMATION
INCONSISTENT OPERATIONS | INCONSISTENT SECURITY | INCONSISTENT DEV-UX
MODERNIZE INFRASTRUCTURE
Run and manage containers better

NEW ARCHITECTURES
Operate consistently across any cloud

MODERNIZE APPLICATIONS
Improve developer productivity

BUSINESS INNOVATION
Transform the way you run your business

HYBRID CLOUD IMPACTS EVERY DECISION MAKER
CUSTOMER ADOPTION OF EMERGING TECHNOLOGIES

Source: Company subscription data. CAGR is from FY16 to FY18
A DAY IN THE LIFE
REALIZING OPPORTUNITIES IN HYBRID CLOUD

From virtualization to containers
Hybrid cloud multicloud
App modernization and developer productivity
Managed cloud services

KeyBank

AMADEUS

BMW

T·Systems
ENABLING THE HYBRID CLOUD PORTFOLIO
THE CHALLENGES OF KUBERNETES PLATFORMS

- VELOCITY OF CHANGE (OPS)
- DELIVER STABLE OPERATIONS (OPS)
- MANAGE COMPLEX TASKS (DEV)
- REMAIN FLEXIBLE (DEV)
RED HAT, LINUX, CONTAINERS AND KUBERNETES

- 2010: Containers in RHEL (cgroups)
- 2014: Docker containers in RHEL
- 2015: OpenShift ships Kubernetes 1.0
- 2017: OpenShift certified Kubernetes (CNCF)

2nd largest Kubernetes contributor
11 releases of Kubernetes via OpenShift
15 Lead or co-lead 15 Kubernetes SIG groups
450+ members of OpenShift Commons Community
~300 SYSTEM CALLS
And associated data structures creating direct dependency on the kernel

~2400 SYMBOL DEPENDENCIES
On core system libraries and in Linux

~7700 SYSTEM CALLS
Called by Kubernetes to create and start a single container
OPENSHIFT DEDICATED UPGRADE

257
BUGS FIXED

between
Kube 1.9 and
OpenShift 3.9

194
BUGS FIXED

between
OpenShift 3.9
and 3.9.33

29
BUGS FIXED

since
3.9.33

Source: Matthew Barnes, OSD 3.9 upgrade summary. internal blog post, Mojo. August 2018.
# Openshift Dedicated Upgrade

<table>
<thead>
<tr>
<th>4 Issues</th>
<th>30 Minutes</th>
<th>?</th>
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<tbody>
<tr>
<td>M5 instance type kernel bug</td>
<td>(on average) for us to resolve issues for the customer</td>
<td>How long would it take a customer to fix &amp; patch Kube 1.9?</td>
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<td>Amazon losing IPs</td>
<td></td>
<td></td>
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<tr>
<td>2 Kubernetes issues</td>
<td></td>
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</tbody>
</table>

*Source: Matthew Barnes, OSD 3.9 upgrade summary. Internal blog post, Mojo. August 2018.*
ENABLING SUCCESS IN HYBRID CLOUD
CRITICAL AREAS OF HYBRID CLOUD SUCCESS

- Simplify the cloud experience everywhere
- Enable cloud consistency everywhere
- Balance innovation and cost reduction
- Empower access to new cloud services
SIMPLIFY THE CLOUD EXPERIENCE EVERYWHERE
Making hybrid cloud as simple as public cloud

- Over-the-air software updates
- Day 1 and Day 2 automated operations
- Operator framework for ISVs
- Red Hat® Container Catalog and operator marketplace
ENABLE CLOUD CONSISTENCY EVERYWHERE

RED HAT® OPENSHIFT®

RED HAT OPENSTACK® PLATFORM

CLOUD IaaS

RED HAT OPENSTACK PLATFORM

EDGE METAL

RED HAT ENTERPRISE LINUX®

PRIVATE CLOUD

PRIVATE CLOUD

TELCO CLOUD

EDGE CLOUD
BALANCE INNOVATION AND COST REDUCTION

NEW CLOUD-NATIVE APPLICATIONS

OLD APP → RED HAT MIDDLEWARE → MODERN APP

MONOLITHS TO MICROSERVICES

$CASH

VIRTUAL

BARE METAL

PROPRIETARY > CONTAINERS > BARE METAL
EMPOWER ACCESS TO NEW CLOUD SERVICES

- AWS services in Red Hat® OpenShift® service catalog
- Azure services in Red Hat OpenShift service catalog
- Red Hat and Azure delivering managed OpenShift services
ENABLING SUCCESS IN THE HYBRID CLOUD
MOVING INTO THE THIRD ERA OF KUBERNETES

1st generation
2015-2016

FROM GOOGLE TO OSS TO ENTERPRISE

2nd generation
2016-2017

NEW APPS
OLD APPS
MORE CLOUDS

3rd generation
2018-2020

AUTOMATED
OPS | APPS
HYBRID CLOUD

NEW APPS
OLD APPS
MORE CLOUDS
FROM ISOLATED CLOUD INFRASTRUCTURE
TO CONVERGED CLOUD PLATFORM

APP

APP

APP

APP

PHYSICAL

VIRTUAL

PRIVATE CLOUD

PUBLIC CLOUD

redhat

aws

Azure

Google Cloud
OPERATORS - APPS AUTOMATED LIKE CLOUD SERVICES

YOUR APPLICATIONS AUTOMATED LIKE PUBLIC CLOUD SERVICES

BUT RUNS ON OPENSHEET ON EVERY CLOUD
HYBRID CLOUD ALLOWS SOFTWARE TO RESHAPE EVERY INDUSTRY