BUILD A PRIVATE PAAS

WITH RED HAT CLOUDFORMS AND JBOSS ENTERPRISE MIDDLEWARE

INTRODUCTION

Platform-as-a-service (PaaS) is a cloud service model that provides consumers[1] with services for building, deploying, and managing applications. Infrastructure-as-a-service (IaaS) provides self-service access to IT infrastructure like compute, storage, and networking resources. PaaS layers on top to provide an additional level of abstraction. Whereas the IaaS consumer is most likely a system administrator or IT manager, PaaS provides application developers, testers and administrators with services to develop, test, deploy, and manage applications in a cloud environment.

PaaS can provide organizations with many key benefits. These include self-service application provisioning, standardized deployments based on pre-built application images, and simplified application management.

However, while many organizations want to enjoy the benefits of PaaS, they also want to maintain centralized control over all of their applications. They want to be able to empower their PaaS end users, but without giving up centralized application administration and foregoing established management processes. In addition, these organizations want the option to leverage their own infrastructure to deploy their applications in an on-premise private cloud, combined with the flexibility to leverage public cloud providers by transitioning to a hybrid cloud. They need to seamlessly migrate existing applications to the cloud, without having to rewrite or re-architect them. They want to build new cloud-enabled applications, while leveraging existing development tools, frameworks and processes.

For these organizations, building a private PaaS is the right option.

RED HAT CLOUDFORMS

Red Hat® CloudForms helps organizations build on-premise, private[2] PaaS solutions that leverage JBoss Enterprise Middleware to streamline and simplify application and service provisioning.

CloudForms is Red Hat's IaaS product. It's designed with a focus on your applications so you can deliver true IT-as-a-service through your private or hybrid cloud. CloudForms provides users with self-service so they can deploy resources—and thereby respond to business needs—faster. It breaks down silos of capacity and thereby eliminates complexity. And it does so with advanced capabilities from high performance scheduling and messaging to a robust security framework. CloudForms integrates with existing products and technologies, including physical servers and virtualization platforms from other vendors, to provide the easiest on-ramp to an on-premise cloud. It lets you migrate to multiple public cloud providers, including those running a software stack from a different vendor, if you so choose.

Many current JBoss users have already started to build private PaaS solutions to bring the benefits of PaaS to their JBoss applications. CloudForms extends and builds on these existing capabilities through increased automation, flexibility, and control. It lets customers evolve their middleware to incorporate attributes of PaaS by providing self-service provisioning, governance, and portability across multiple clouds, for both

1 Consumers in this context refers to the user of a service, as opposed to the provider or builder of the service.

2 We use on-premise and private interchangeably in this whitepaper. However, to be completely accurate, many organizations use dedicated hosting providers to build their clouds. These are still private insofar as the organization maintains complete control over the underlying infrastructure.

existing enterprise applications and new application deployments. Rather than give up centralized control of their applications and distribute management decisions to each application team, CloudForms allows organizations to centrally manage their applications with an on-premise solution that can leverage both in-house infrastructure and public cloud services for application deployments. It provides organizations with the flexibility and convenience of a PaaS solution, while allowing them to retain control of their applications.

BUILDING A PRIVATE PAAS WITH RED HAT CLOUDFORMS AND JBOSS ENTERPRISE MIDDLEWARE

With Red Hat CloudForms and JBoss® Enterprise Middleware, organizations can build a private PaaS that empowers their developers, testers, and administrators, while retaining centralized control over their applications. The benefits of this approach include:

- Standardized application deployments
- Deployment flexibility
- Self-service application provisioning
- Integrated management
- Development choice

STANDARDIZED APPLICATION DEPLOYMENTS

Many organizations face challenges around standardizing their various application deployments across development, test, and production systems as they progress through the application lifecycle. These challenges only increase as these same applications are deployed across physical, virtual, and cloud environments. CloudForms lets organizations standardize their application deployments across these different environments, throughout the full application lifecycle.

CloudForms does this through the application engine component, allowing administrators to create standardized application definitions by creating templates that define the application services, their relationship, and configuration. These templates are then used to generate images from associated content that users can deploy to a target physical, virtual, or cloud environment. One or more templates can be aggregated or associated and given the operational parameters and configurations needed to boot, initialize, and provide the defined services. The application engine also handles complex, multi-tiered applications that span multiple virtual machines and physical machines.

For JBoss applications, administrators can leverage JBoss Operations Network (JBoss ON). JBoss ON is Red Hat's integrated management solution for JBoss Enterprise Middleware. It provides a single point of control to deploy, manage, and monitor your JBoss middleware, applications, and services. JBoss ON is established and proven for managing physical JBoss application environments. It can also work in concert with CloudForms to extract content and configuration from existing managed applications in order to create JBoss application templates.

CloudForms is a heterogeneous solution that can also be used to define, deploy, and manage non-JBoss applications. This allows administrators to standardize application deployments regardless of the middleware platform they are built on. CloudForms also enables administrators to create cloud resource pools for running these applications, manage policy and workflow around those resources, and govern access and permissions for the resources.

DEPLOYMENT FLEXIBILITY

CloudForms allows organizations to deploy their applications in a private or hybrid cloud managed on-premise. Organizations may be hesitant to leverage public clouds for mission-critical applications for security, regulatory compliance, and related reasons even if they make use of them for new or less-critical workloads. JBoss customers may want to move their existing application environments to a private or hybrid cloud, but wish to do so in an evolutionary way that bridges from their existing infrastructure to a private PaaS environment. CloudForms eases the migration of applications to a private cloud and provides organizations with the flexibility to leverage public clouds where they fit.

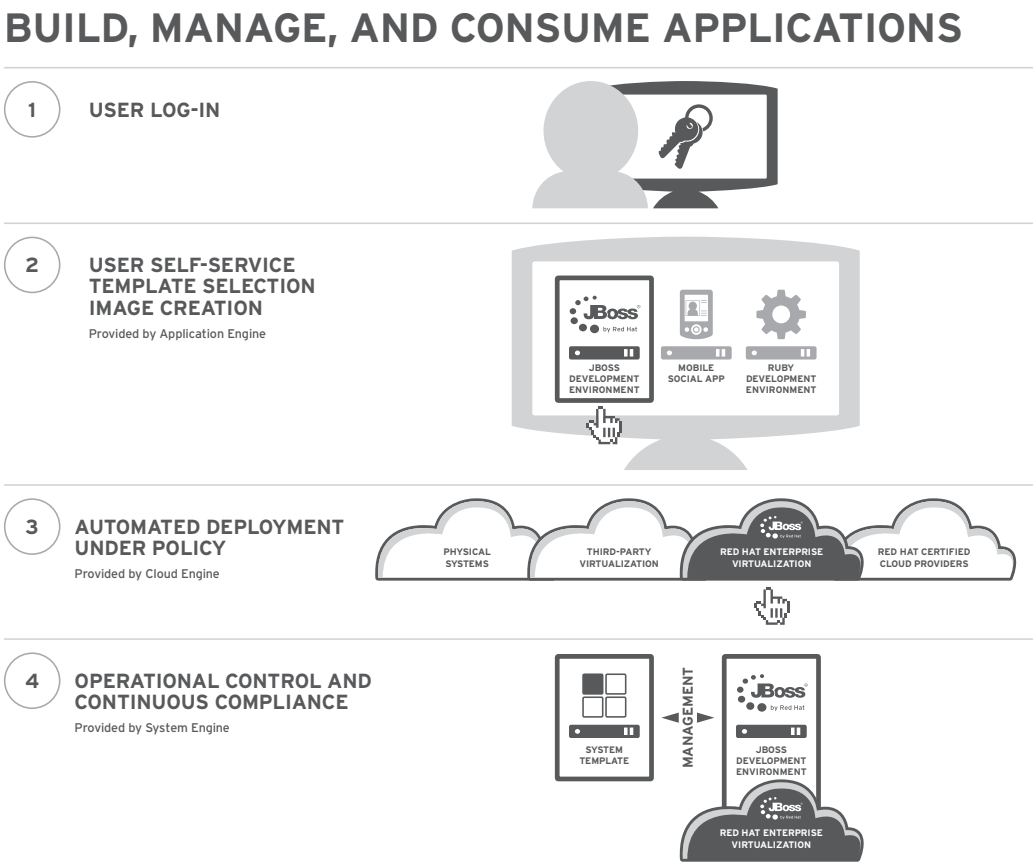
The CloudForms Cloud Engine component leverages the Deltacloud API to deploy application images to a physical, virtual, or cloud-based target. Using Deltacloud, users can leverage multiple virtualization platforms (including Red Hat Enterprise Virtualization, VMWare ESX, and Microsoft HyperV) and choose from several public cloud providers (including Amazon EC2 and others). This provides organizations with deployment flexibility and portability when building their private and hybrid clouds, and helps them avoid vendor lock-in and manage costs.

SELF-SERVICE APPLICATION PROVISIONING

One of the key benefits provided by PaaS is self-service application provisioning. Users who can provision applications on-demand, whether it be for development and testing or even for production deployments, are often more productive. Many organizations want to empower their developers, testers, and administrators by providing a PaaS environment, but retain centralized administration of these applications. CloudForms allows organizations to build a private PaaS that enables self-service application provisioning, while retaining this centralized administration and control.

Users can access and deploy their application images through the CloudForms self-service web portal. There, they are able to access standardized application templates provided by CloudForms administrators. A user makes a self-service request to instantiate a service; this could be anything from a JBoss server to a more complex multi-tiered application. The appropriate image is then deployed to a target as determined by policy. Cloud Engine provides the self-service portal to handle these user requests. It also provides role-based access control, enforces policy and resource quotas, and meters usage.

BUILD, MANAGE, AND CONSUME APPLICATIONS



INTEGRATED MANAGEMENT

Organizations can centrally manage their applications with CloudForms and JBoss ON. One of the concerns that organizations may have with PaaS is losing centralized control of their applications and having to change established management processes. A private PaaS allows organizations to retain control over the management of their applications, while still enjoying many of the benefits that PaaS provides.

JBoss templates provided by Red Hat are pre-configured with a JBoss ON management agent. This ensures that JBoss application instances deployed by CloudForms can then be managed from the JBoss ON console. This allows users to provide consistent, centralized management of all their JBoss applications across physical, virtual, and cloud-based environments. JBoss ON provides users with inventory and configuration management of all JBoss application instances. JBoss ON also provides historical monitoring of performance and availability for deployed applications, as well as integrated alerting and notifications when issues occur.

CloudForms Application Engine holds the canonical definition of applications in its application templates and manages the lifecycle of those templates–for both JBoss and other applications. Application templates can be versioned and users can deploy different versions to different environments such as development, test, and production. Users can also synchronize an instance of an application deployed by CloudForms with the canonical template held by the Application Engine. Application Engine can also be configured to dynamically update image builds in response to changes in the content repositories or definitions. This ensures that the Cloud Engine is able to always deploy the most up-to-date version of images.

CloudForms System Engine provides additional operational management for running systems across physical, virtual, and cloud environments. This management includes continuous compliance of content and configurations (as well as entitlements for Red Hat products), all consistent with the definitions used by Application Engine. It complements the functionality of JBoss ON by providing management for underlying systems and non-JBoss applications. And it extends the functionality of Application Engine by monitoring these systems and updating them during run time on an ongoing basis.

DEVELOPMENT CHOICE

Many current PaaS offerings introduce a new, proprietary application development environment or deliver a PaaS based only on simple developer frameworks—limiting choice and application portability. This presents challenges for organizations that want to migrate existing applications to the cloud without having to rewrite them. Nor does it let them build new cloud-enabled applications that leverage existing development tools, frameworks, and processes. Red Hat CloudForms and JBoss Enterprise Middleware enable users to leverage the cloud for on-premise application deployments while providing the richest development environment, cloud-enabled runtimes, and services.

JBoss Enterprise Middleware is a comprehensive, enterprise-class middleware portfolio. JBoss Enterprise Middleware is much more than just an application server. It provides tools and platforms for developing, deploying, and managing applications and services; integrating applications, services, and data; managing business rules; and enabling rich user interaction and collaboration–either on-premise or in a public cloud.

Compared to limited or proprietary PaaS offerings, JBoss offers much more, including:

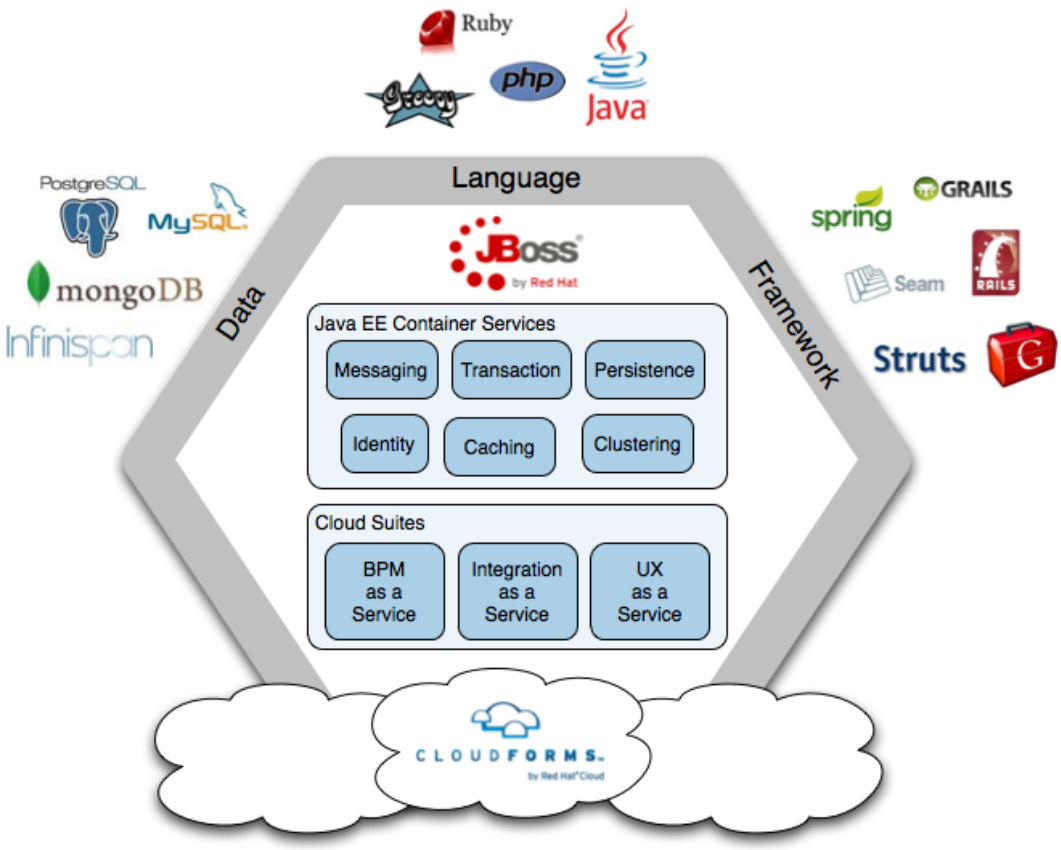
- Open choice in development languages and tools
- A comprehensive set of middleware services
- Enterprise-ready open source solutions
- Complete application lifecycle management

CONCLUSION

Organizations can simplify the development, deployment, and management of their applications and empower their application developers, testers, and administrators with PaaS. However, while many organizations want the benefits of PaaS, they need to retain centralized management control of their applications. They need a solution that provides benefits like self-service application provisioning, flexible and standardized application deployments, and integrated management, but does not force them to lose control or radically change existing management and development processes. For these organizations, building a private PaaS with Red Hat CloudForms and JBoss Enterprise Middleware provides the right combination of flexibility and control to meet all of their needs.

Red Hat CloudForms and JBoss Enterprise Middleware combine application-aware cloud management tools and cloud-enabled middleware to help organizations develop, deploy, and manage their applications in private and hybrid clouds. This enables organization to build a private PaaS environment that provides the advantages of PaaS for new and existing applications, while maintaining centralized control over application deployment and operations, and without disrupting existing development and management processes.

BUILD, MANAGE, AND CONSUME APPLICATIONS



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