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INTRODUCTION

Red Hat® CloudForms is an open hybrid cloud management product. It delivers the flexibility and agility that businesses want with the control and governance that IT needs. This allows organizations to build a hybrid cloud that encompasses their heterogeneous infrastructures, thereby avoiding vendor lock-in, while also managing the applications running in that cloud.

Red Hat CloudForms allows you to:

• Build and manage an open enterprise hybrid cloud that can span across multiple heterogeneous virtualization platforms, and extend to the public cloud
• Build and manage applications in that cloud, giving enterprises the level of control they need across all their classes of workloads
• Provide end users with self-service capabilities for increased speed and flexibility, while giving IT administrators the tools they need to establish policies to govern that access

OPEN CLOUDS

The open cloud approach taken by Red Hat, specifically with its CloudForms product, provides important benefits to both users and builders of clouds. It lets them deploy on their choice of private or public infrastructures. It lets them bring both new and existing IT assets into the cloud and manage them together. It lets them evolve to the cloud, gaining incremental value at each step along the way. It ensures that their applications and data can be moved across clouds. It keeps them in charge of their technology roadmaps and the future of their IT.

Building a cloud is a highly strategic IT decision. In fact, it’s perhaps the most important single decision CIOs will make this decade. But not all approaches are created equal. Of the three basic models for building a cloud, only one maximizes the value of that cloud and the business benefit derived from it.

The first approach essentially attempts to translate the “Greenfield” methodology used by service providers into an enterprise environment. This is alluringly simple, but also naively simple. For the vast majority of organizations, IT assets tarred with the pejorative “legacy” are also critical and core to the business.

The second approach builds a cloud from a small part of your infrastructure, such as an existing virtualization platform. The result? Rather than breaking down and cutting across silos with your cloud, you’ve created a new silo. Most of your IT universe’s capabilities remain untapped in this scenario.

The final approach, and the one that Red Hat advocates, is to bring the broadest set of IT assets under a cloud management framework. Supporting these capabilities requires a cloud management product that can span multiple virtualization platforms, a variety of public cloud providers based on a variety of underlying technologies, and even physical servers. It requires a product like CloudForms that lets you build an open cloud.

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Openness in the cloud is not just a buzzword or a narrow description of some capability. It is an overarching philosophy that spans a variety of dimensions.
• Portability of applications and their runtime environments enabled across clouds.

Only an open cloud delivers on the full value and promise of cloud computing. It brings the efficiency, agility, and cost benefits of cloud to more of your IT infrastructure, to more applications, and to more users. It leverages your existing IT investments in hardware, software, and training—allowing you to build a cloud in an evolutionary way, reducing costs and risks. It ensures you can select the best technologies for your users, now and in the future. It prevents one vendor from controlling your access to the greatest innovation, the lowest costs, and the best economic model.

UNDER YOUR CONTROL

CloudForms delivers on open cloud, bringing together cloud computing with Red Hat’s rich heritage as the open source leader. This heritage is not just about open source code but the communities and business models that go hand-in-hand. Red Hat is the vendor best prepared to help you build an open cloud using CloudForms.

At the same time, CloudForms ensures that certification and governance can be baked into cloud infrastructure. It does so by adding rich policy controls to user self-service, including application lifecycle management designed for the cloud, and by offering the choice of Red Hat’s proven stack and ecosystem to better deliver enterprise-class service-level agreements (SLA) in the cloud.

WHAT IS CLOUDFORMS?

CloudForms is an open hybrid IaaS software product that can manage heterogeneous IT resources, both on-premise and in public clouds. Let’s unpack that statement and describe the product and how it might be used.

CloudForms is an open source software product that an IT department installs on a server or servers in order to manage a pool or pools of IT resources. CloudForms performs a variety of tasks:

• Creates pools of resources, which it refers to as clouds, from heterogeneous infrastructures that can include virtualized systems using a mix of hypervisors and virtualization management software, and infrastructure from the public cloud running a variety of technology stacks. Hybrid is commonly used to refer to cloud management that spans both dedicated (whether on-premise or hosted) resources and those shared with other organizations (multi-tenant) within a public cloud provider.

• Allows administrators to use an application blueprint to define services and policies associated with these services, and to make these services available in a catalog. When instantiated, these services are deployed to a resource pool in the form of images that include applications, operating system, and associated supporting software. This level of abstraction is called Infrastructure-as-a-Service (IaaS).

• Provides users, such as developers, with self-service access to services through a web interface. Access to and deployment of these services, such as a mobile development environment, is controlled by the policies set by the administrator when the service is initially defined.

• Manage services through their lifecycle by monitoring running instances, updating services based on policies, and a variety of other functions.

These capabilities are important because, collectively, they allow IT to offer all of the agility and benefits of cloud while still retaining control of the workloads.
BUILD AND MANAGE CLOUDS

Once you have determined your goals and objectives—and are ready to transition to hands-on work—you’ll build an open hybrid cloud infrastructure. Red Hat CloudForms enables building an open hybrid cloud architecture by allowing organizations to use their virtual infrastructure, and that of the public cloud.

In this process, infrastructure resources are grouped together into resource pools called clouds. Organizations can create different types of clouds for different functions such as development, test, and production. For example, a test cloud could be made up of resources from a public cloud provider, while a production cloud could contain resources from multiple hypervisors. This allows organizations to select the right infrastructure for the right job. In addition, CloudForms allows you to use resources from multiple resource providers and combine them into the same cloud pool.

CloudForms lets you build a cloud out of different parts of your infrastructure both virtual and public. CloudForms can incorporate infrastructure from many vendors, not just one virtualization vendor or public cloud provider. This brings the efficiency, agility, and cost benefits of cloud to more of your IT infrastructure, to more applications, and to more users than any other approach.

Over the next several years, there will be a great deal of innovation in pricing, service levels, service offerings, and security for public clouds. An open cloud architecture that makes it possible to take advantage of these innovations without disrupting your business makes it easy to utilize these options at the appropriate time and for the appropriate applications. Closed cloud architectures limit your choices to a small set of infrastructure providers and puts your vendor in control of your infrastructure.
The open cloud approach delivers key advantages:

- By allowing clouds to span a heterogeneous and hybrid infrastructure, CloudForms brings the benefits of cloud across all of your IT resources, not just a subset.
- By running on your choice of deployment platforms and providers, CloudForms prevents one vendor from controlling your economic model and access to innovation.
- CloudForms provides a straightforward path for enterprises, not an expensive migration process, by letting them leverage existing infrastructure that is already in place.
- By spanning different types of resources, CloudForms delivers greater efficiency and agility across all of your IT infrastructure instead of making cloud computing just a new type of silo.

BUILD AND MANAGE APPLICATIONS IN YOUR CLOUD

An open hybrid cloud can provide tremendous agility and value in managing infrastructure. However, cloud computing also can be highly disruptive to the processes and tools enterprises use for managing their legacy systems and applications.

By providing an unmanaged, self-service portal, many vendors take compliance out of the hands of IT. Software provisioning—one of the key tools IT uses for managing compliance, security, and governance—is often put into the hands of developers and end-users who do not know about or care about IT compliance, security, or governance. In order for enterprises to run and support production applications in their clouds, they need a way to bring these IT management capabilities to the cloud. The Red Hat approach to cloud with CloudForms encourages asset- and application-based management that will make ownership, audit, and certification easier to own and therefore reduce both risk and hidden management costs in the future.

CloudForms gives you the tools to combine user self-service with the rich policies needed to keep control over your applications in a cloud environment.
The application lifecycle management tools provided by CloudForms allow IT to offer all of the agility and benefits of cloud while still retaining control of workloads. Application management tools provide the ability to:

- Provide simple, self-service access to complex application stacks rather than low-level infrastructure.
- Define a single application blueprint, which is a template that defines the software components for the application and the target environment, that allows the application to be run on a wide variety of infrastructure types.
- Manage the compliance and governance of running applications against an application blueprint. This includes the abilities to patch, apply security errata, and manage licenses and subscriptions.
- Manage the lifecycle of applications in the cloud. For example, from one application blueprint, organizations can provide rapid, self-service access but enable deployment of development instances only to the public cloud, test instances only to a virtualization cluster, and production instances only to a virtualization cluster.
- Users want the simplicity they get from public cloud providers such as self-service. They want to be in control. They don't want to think about underlying infrastructure. They want things to just work. In short, they have expectations set by the consumer web and by the plethora of “magical” iDevices that they increasingly bring to their day jobs.

Historically, enterprise IT sat largely in opposition to these user desires. Applications focused on business processes rather than user interaction. Minimizing risk and cost was equated to minimizing user choice. And a myriad of unavoidable regulatory, compliance, security, and audit needs meant that laissez faire attitudes to where applications ran and data was stored were a non-starter.

With CloudForms, it is not a case of either/or. You can have both. Users can access applications from a self-service portal, but access to those applications, infrastructures, and configurations is defined and controlled by IT. What IT is able to provide to end users via CloudForms is governed self-service, which provides the business with access to a more agile IT infrastructure, that still complies IT governance standards.

SIMPLIFIED, EFFICIENT, FLEXIBLE — WITHOUT LOCK-IN

With CloudForms, you get an open cloud. You can deploy on your choice of private or public infrastructure. You can bring both new and existing IT assets into the cloud and manage them together. You can evolve to the cloud, gaining incremental value at each step along the way. You can ensure that your applications and data can be moved across clouds. You remain in charge of your technology roadmap and the future of your IT.

And, with the complete Red Hat portfolio, you do not need to give up the highest levels of reliability, performance, and support to which you have grown accustomed to with Red Hat. Whether it is maintaining fine-grained control of policies in their self-service cloud infrastructures or whether it is taking advantage of SELinux security controls in Red Hat Enterprise Linux in a hybrid cloud environment, Red Hat brings together the best of both worlds: the efficiencies and simplicity of public clouds and, where they are needed, the operational requirements of enterprise IT.
Red Hat was founded in 1993 and is headquartered in Raleigh, NC. Today, with more than 70 offices around the world, Red Hat is the largest publicly traded technology company fully committed to open source. That commitment has paid off over time, for us and our customers, proving the value of open source software and establishing a viable business model built around the open source way.

In contrast to, say, Software-as-a-Service (SaaS) or Platform-as-a-Service (PaaS) that work at higher levels of abstraction. Of course, an IaaS such as CloudForms can be (and is) used to create a PaaS such as Red Hat OpenShift, which is designed to insulate developers from lower levels of the software stack such as operating systems.