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TECHNOLOGY DETAIL

# RED HAT CLOUDFORMS ENTERPRISE-GRADE MANAGEMENT FOR AMAZON WEB SERVICES


## ABSTRACT

Do you want to use public clouds like Amazon Web Services (AWS) to flexibly extend your datacenter capacity, as and when needed? In this technical detail, we describe how Red Hat® CloudForms offers you a unified management framework with advanced life cycle management capabilities across infrastructure platforms, such as OpenStack®, VMware, Red Hat, and Amazon.


## TABLE OF CONTENTS




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**RED HAT CLOUDFORMS BRIEF CAPABILITIES VIEW:**

**SELF-SERVICE PROVISIONING & MANAGEMENT**

End users can request, provision, deploy, operate, manage, and decommission their own services configured with approval processes and enterprise standards enforced.

**GOVERNING, TRACKING, & COMPLIANCE**

Deploy and manage clouds with policy-based control, mitigating risk associated with shared infrastructure. Secure role-based delegation, approval workflow, quota enforcement, and IT policies ensure service-level agreements

**COST ALLOCATION & CHARGEBACK**

Red Hat CloudForms enables cost transparency and accountability so that business owners and IT can understand the actual cost of the infrastructure required. Constantly monitor the actual consumption of server, storage, and network resources and organize by enterprise-specific classifications.

## INTRODUCTION

Hybrid cloud computing service models present real challenges for enterprise IT staff who already face increasingly complex virtualized infrastructures. Finding the right balance between control and autonomy for cloud users is key to the manageability, scalability, and, ultimately, the success of hybrid cloud environments, especially where public cloud resources are involved. Achieving and maintaining that balance requires a flexible set of management tools that enable a wide range of self-service and automation capabilities. These tools must provide policy-based visibility, control, and automation for workload instances in the public cloud to effectively manage overall IT capacity and provide on-demand customer service. Red Hat CloudForms, an enterprise-grade cloud management platform, offers the control and automation IT staff need to manage applications in public clouds.

## MANAGING WORKLOADS IN VIRTUAL PRIVATE CLOUDS

To flexibly extend datacenter capacity, many enterprises are moving workloads onto public clouds, including Amazon's Web Services (AWS) cloud computing platform. This move can, in many cases, offer greater efficiency and lower capital expenditures (CapEx) and operating expenses (OpEx) for workload execution. To effectively manage workloads in Amazon's public cloud with AWS, organizations need to have AWS presented in a way that is seamless to their existing IT local area networks (LANs). Red Hat CloudForms does this by using Amazon Virtual Private Cloud (VPC)—a logically isolated, virtual networking section of the AWS cloud—to allow organizations to provision and launch Amazon Machine Instance (AMI) workloads in their own defined VPC virtual networks.

## MANAGING AWS CLOUDFORMATION TEMPLATES AND STACKS

AWS CloudFormation provides templates, text-based files that describe all the AWS resources to deploy to run your application. The stack is the set of AWS resources created and managed as a single unit when AWS CloudFormation instantiates a template. With Red Hat CloudForms, application administrators can use commercial off the shell orchestration templates available in AWS CloudFormation, or their own custom templates, to provision multicomposite applications in AWS, configure related application dependencies and orchestrate required cloud resources.

- Red Hat CloudForms works with AWS CloudFormation to:
- Discover and inventory orchestration templates, resource stacks, and associated elements.
- Import and manage AWS CloudFormation orchestration templates.
- Model relationships of AMI instances with their stacks and stack resources.
- Provision AWS CloudFormation templates and associated stacks via Red Hat CloudForms services to an AWS region.
- Create reports on orchestration templates and stacks.

Red Hat CloudForms automatically discovers, inventories, and models AWS CloudFormation templates, stacks, infrastructure elements, application relationships and dependencies. Red Hat CloudForms can then provision these templates and stack resources from the Red Hat CloudForms service catalog, using the AWS CloudFormation orchestration engine to provision the stack in AWS as a single unit.

### CLOUD WORKLOAD LIFE CYCLE MANAGEMENT

Automatically discover, assess, classify, monitor, and track virtual machines (VMs) in any state—powered on, off, or suspended— without installing agents. Maintain comprehensive visibility of VM configuration, virtual hardware, performance, utilization, allocation, and event information together with relationship and dependency mapping.

### CAPACITY MANAGEMENT & RESOURCE UTILIZATION

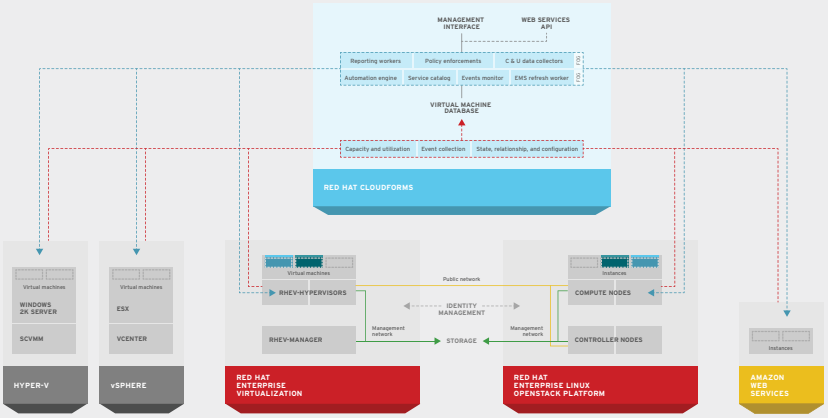
Red Hat CloudForms provides IT with advanced capacity planning and sophisticated resource management capabilities, including trending and alerting. By combining extensive configuration and change information with operational event data and utilization and performance statistics, the product uniquely addresses both the quantitative and qualitative management requirements needed by enterprises to maximize their infrastructure investments.

## MANAGING WORKLOAD STATES IN AWS

For workloads running in regions or zones, Red Hat CloudForms can determine changes in workload states without having to poll each region or zone discretely for changes. AWS Config notifications are used to retrieve Amazon Simple Notification Service (SNS) messages about AWS instance and resource changes in a given region. Red Hat CloudForms can connect to any Amazon-based provider's AWS Config_topic SNS notifications to monitor for changes.

A parser on Red Hat CloudForms consumes notifications, then determines the changes and emits events matching the change type to delivering updated information into Red Hat CloudForms for AWS-hosted workloads. The automation policy can then be conditioned on events from the SNS notifications to support life cycle resource management, resource governance, and configuration changes, as well as audits and compliance of managed AMI instances.

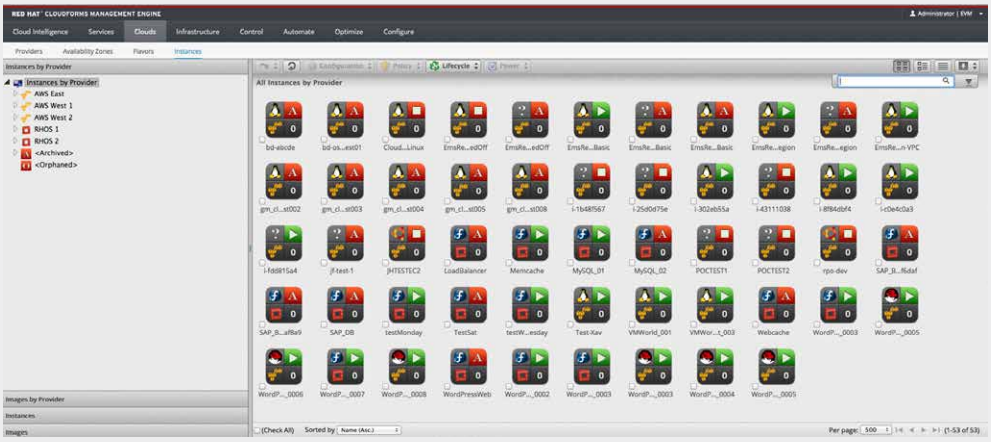
### RED HAT CLOUDFORMS CLOUD MANAGEMENT




*Red Hat CloudForms extends life cycle management to the Amazon AWS cloud provider platform.*

## RED HAT CLOUDFORMS AND AWS AMI

Red Hat CloudForms enables rapid policy-controlled provisioning of entire IT application stacks and system workloads as AMI instances and resources through its self-service catalog(s). As a result, enterprise consumers and users are provided with end-to-end life cycle management of AMI workloads and resources in their defined VPCs. When resources are requested via the service catalog, they are instantiated simply but powerfully with the support of the Red Hat CloudForms automation engine. Red Hat CloudForms uses AWS Identity and Access Management (IAM) users and groups for authentication, along with role-based access control (RBAC) and permissions, to provision and manage AMI instances and resources.




*Red Hat CloudForms unified management portal: Amazon workload instances are consolidated with private cloud and virtual workloads in a single unified interface*

Red Hat CloudForms lets administrators stand up AWS AMI instances using a wide variety of policy rules based on logic from business, regulatory, IT, or AWS sources. And with its single portal interface, Red Hat CloudForms lets organizations deploy resources seamlessly, both on- and off-premise, through a unified dashboard view that can consolidate mashup details of IT virtual infrastructures, on-premise private clouds, and VPCs residing within AWS.

Red Hat CloudForms lets you easily roll out Amazon AMI-based services, ensuring that the right users connect back into the correct VPC subnets. Furthermore, because Red Hat CloudForms performs state management for AMI instances, it will ensure that the correct state is maintained; for example, if a workload is reconfigured in AWS to run in another region or availability zone, Red Hat CloudForms will identify the state change and can actively respond by notifying the helpdesk, issuing alerts when needed.

Red Hat CloudForms can enforce state policies on the source AMIs, as well as placement in destination regions and availability zones. Your identity or group affiliations can affect what can or cannot be provisioned per policy, and also where and when provisioning occurs. This will ensure that the right instances are provisioned correctly for the right purpose, per the organization's regulatory, business, and IT rules.

Red Hat CloudForms monitors instance workload performance across VMware, Red Hat, and within AWS or OpenStack, providing alerts when performance-related thresholds are met. Using this data, Red Hat CloudForms can flex workloads into AWS VPCs automatically for those virtualized services and can automatically scale required service resources into AWS.

The ability to assess workloads in AWS for capacity, performance, and utilization aspects lets Red Hat CloudForms manage instance uptime and availability. This means that if an instance goes offline, Red Hat CloudForms can automatically spawn new instances in other availability zones. To do so, the VPC interfaces for the failed instance are moved to the new instance while retaining all the network configurations, including the static IP addressing, therefore making the instantiation of new instances in a DR mode relatively easy and risk-free.

Organizations that want to spin up limited, time-scoped projects in AWS can use Red Hat CloudForms to set retirements on any active AMI instances or resources. Red Hat CloudForms will manage the end-to-end life cycle of the workloads with notification prior to impending retirement, allowing the flexibility to extend if needed. When retiring workloads, Red Hat CloudForms can simply terminate the instances or migrate them back to an on-premise virtual infrastructure or cloud, such as Red Hat Enterprise Linux® OpenStack Platform, for archiving or continued development.

## ADVANCED CLOUD MANAGEMENT

Red Hat CloudForms capabilities enable organizations to extend existing virtual infrastructures into highly scalable enterprise clouds. Red Hat CloudForms removes the high costs and complexities of cloud infrastructures by delivering key management capabilities in a comprehensive solution.

CloudForms has unique interoperability with other management services, agents, and processes, enabling highly automated IT service management for hybrid clouds. Service request, incident, release, change, and configuration management activities can be tightly integrated to provide end-to-end automated cloud service management, including:

- **Seamless self-service portals** that provide users with role-delegated, automated self-provisioning of catalog-driven IT services, with requisite request approvals and integration with enterprise service catalogs.
- **Cloud life cycle management,** from service provisioning to workload retirement, with automatic aging, tracking, and monitoring.
- **Advanced chargeback, quotas, and metering,** with detailed usage tracking by configurable classifications and support for multiple rates tables (fixed cost, allocation and usage) and reservation based chargeback.
- **Continuous discovery and insight** from automatic, agent-free discovery of Amazon instances and relationships, capacity, and utilization, along with configuration tracking and drift comparison.
- **A unified operations management portal,** with multisite federation that offers visibility across the entire cloud and virtual infrastructure, including runtime operations, service configuration, utilization, events, reports, and timelines.
- **Operational dashboards** that let users track resource consumption, audit virtual instances and services, assess compliance, check configurations, and help identify causes of operation problems.
- **Advanced capacity planning,** trending, and best-fit AMI and virtual machine instance placement, with factors in resource availability, policies, and business classifications across time periods, optimizing planning and placement.
- **Reporting with automatic scheduling** and distribution, including a rich set of reports, timelines, and charts with detailed information on your cloud infrastructure so you can see application, network, service, user account, operating system, and snapshot information across your virtual machine instances.
- **Integration with enterprise IT systems,** like service catalogs, configuration management databases (CMDBs), and incident and event management tools.

## CONCLUSION

Achieving and maintaining a working balance of control and autonomy in cloud computing service models presents significant challenges for IT staff already tasked with managing dense virtual infrastructures. Finding that balance requires new, flexible management and automation tools. Red Hat CloudForms has unique management and automation capabilities and interoperability with other management agents and processes to enable highly automated IT service management for hybrid and private clouds as well as virtual infrastructures.

## ABOUT RED HAT

Red Hat is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux, and middleware technologies. Red Hat also offers award-winning support, training, and consulting services. Red Hat is an S&P company with more than 80 offices spanning the globe, empowering its customers' businesses.

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INC0269993_0715

NORTH AMERICA
1 888 REDHAT1

EUROPE, MIDDLE EAST, AND AFRICA
00800 7334 2835
europe@redhat.com

ASIA PACIFIC
+65 6490 4200
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
info-latam@redhat.com