



Red Hat Cloud Infrastructure 1.1

Product Guide

Overview of the Red Hat Cloud Infrastructure

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Red Hat Cloud Infrastructure Documentation Team
rhci-docs@redhat.com

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Abstract

This guide is an overview document on what the Red Hat Cloud Infrastructure offering is, how it works at a high level, and what additional resources are available to support it.

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CHAPTER 1. INTRODUCTION

1.1. WHAT IS RED HAT CLOUD INFRASTRUCTURE

Red Hat Cloud Infrastructure is an offering that combines multiple Red Hat products optimized to work together. It is the all-in-one offering that provides virtualization, private cloud, public-cloud interoperability, storage, and a common management framework. This guide gives a high level overview of how the product works.

Red Hat Cloud Infrastructure entitles users to deploy the following products:

- QuickStart Cloud Installer (Red Hat Satellite)
- Red Hat Virtualization
- Red Hat OpenStack Platform with Red Hat Ceph Storage
- Red Hat CloudForms

Red Hat Cloud Infrastructure makes it possible for you to build your own open private hybrid cloud.

Open means that Red Hat Cloud Infrastructure can make use of new open source technologies as they become available.

Private means that Red Hat Cloud Infrastructure makes it possible for you to secure your critical data within infrastructure that you own and control.

Hybrid means that Red Hat Cloud Infrastructure can integrate with cloud technologies that you are already using, or that you might use in the future. These include Red Hat Virtualization and Red Hat OpenStack Platform. It also means that you can direct a portion of your workload to public cloud providers, such as Amazon EC2, Microsoft Azure.

1.2. WHAT CAN RED HAT CLOUD INFRASTRUCTURE MANAGE

Red Hat Cloud Infrastructure is suitable for managing the following:

Virtual Machines

- A few virtual machines.
- A few thousand virtual machines.

Storage

- Hard disks.
- Huge storage arrays.

Hypervisors

- A single hypervisor.
- Hundreds of hypervisors.

Network

- One flat network.
- Multiple physical and virtual networks.

Data Centers

- A local data center.
- All data centers around the world.

Applications

- Develop applications.

1.3. KEY FEATURES

Red Hat Cloud Infrastructure is a solution that allows you to have a cloud infrastructure with Red Hat OpenStack Platform or Red Hat Virtualization, various storage options including Red Hat Ceph Storage with Red Hat OpenStack Platform, a common management framework for cloud providers with Red Hat CloudForms, and a common management framework for lifecycle, provisioning, configuration updates, and subscriptions with Red Hat Satellite.

Some of the key features of Red Hat Cloud Infrastructure are as follows:

Private Cloud Infrastructure (Red Hat OpenStack Platform & Red Hat Virtualization)

- Red Hat OpenStack Platform provides a highly scalable foundation to create and manage a secure private or public cloud.
- Red Hat Virtualization allows abstraction of hardware allowing for greater utilization of compute pool capacity.

Unified Management (Red Hat CloudForms & Red Hat Satellite)

- Operations management scans and discovers existing resources and their relationships across multiple infrastructure providers. It continuously monitors these resources and scans for new ones, providing visibility into operations across the entire environment.
- Lifecycle Management manages deployment, configuration, updates, patches, and subscriptions from a single console.
- Self-service starts with a self-service catalog, and extends to cover the complete lifecycle, operational, and financial management of the deployed services.
- Infrastructure monitoring and risk analysis collects the infrastructure analytics, enabling you to quickly and proactively manage technical risks before they impact operations.

Interoperability

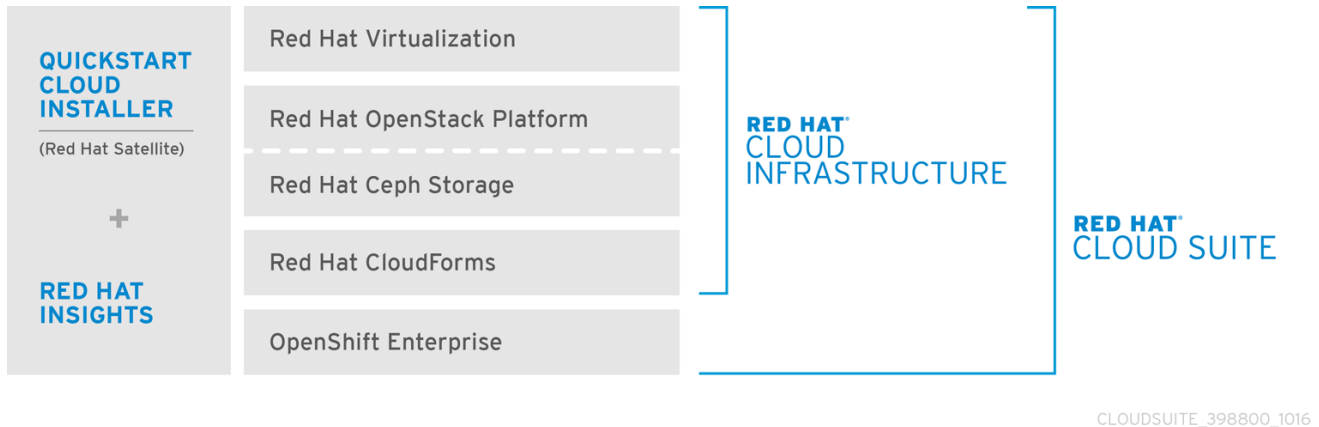
- Open APIs allow enterprises to replace or enhance existing functionality with a long list of Red Hat and certified software options. This allows you to leverage existing software as part of their private cloud.
- Cloud Deployment Planner is an interactive, web-based tool that enables you to quickly determine feature compatibility across multiple products prior to installing or upgrading. See [Section 2.2, “Supportability Matrix”](#) for more information.

CHAPTER 2. ARCHITECTURE AND COMPONENTS

2.1. ARCHITECTURE AND COMPONENTS

Red Hat Cloud Infrastructure builds a private cloud based either on Red Hat OpenStack Platform (RHOSP) with public cloud-like scalability, or Red Hat Virtualization (RHV), which is based on high-performance virtualization.

You can also use Red Hat Ceph Storage, a scalable software-defined storage that is now bundled with Red Hat OpenStack Platform. Red Hat Ceph Storage is designed for commodity hardware and preferred by Red Hat OpenStack Platform users because of its integration with Red Hat OpenStack Platform's modular architecture and components for ephemeral and persistent storage.



Red Hat Cloud Infrastructure consists of the following components:

- Red Hat CloudForms** is the management component of the Red Hat Cloud Infrastructure. Red Hat CloudForms makes it possible to establish a consistent management interface over part of your cloud infrastructure, or over all of it. Red Hat CloudForms delivers the insight, control, and automation, enterprises need to address the challenges of managing virtual environments. This product enables enterprises with existing cloud infrastructures to improve visibility and control, and those just starting virtualization deployments to build and operate a well-managed cloud infrastructure. For more information on supported features in Red Hat CloudForms, see [Platform Support Matrix Red Hat CloudForms 4.0/Red Hat CloudForms Management Engine 5.5](#)
- Red Hat Virtualization** is an enterprise-grade server and desktop virtualization platform built on Red Hat Enterprise Linux. Red Hat Virtualization makes it possible to create and administer virtual machines. Red Hat Virtualization consists of a Manager (to manage virtual machines and other Red Hat Virtualization components) and at least one host computer for running virtual machines (host computers are also referred to as "hypervisors" or "compute nodes"). From the Red Hat Virtualization Manager, you can connect to storage, configure networking, manage user roles, and run reports. Red Hat CloudForms makes requests to the Red Hat Virtualization Manager for services through the Red Hat Virtualization application programming interface (API).
- Red Hat OpenStack Platform** provides the foundation to build a private or public Infrastructure-as-a-Service (IaaS) cloud on top of Red Hat Enterprise Linux. The primary function of Red Hat OpenStack Platform is the creation and management of virtual machines. In this, Red Hat OpenStack Platform resembles Red Hat Virtualization. Unlike Red Hat Virtualization, Red Hat OpenStack Platform is able to split virtualization workloads across multiple controller nodes. As with Red Hat Virtualization, Red Hat CloudForms manages Red Hat OpenStack Platform assets using an API.

- **Red Hat Ceph Storage** is a software-defined storage that combines the most stable version of Ceph with a Ceph management platform, deployment tools and support services, designed for cloud infrastructures and web-scale object storage.

**NOTE**

Red Hat Ceph Storage is integrated with Red Hat OpenStack Platform with a 64TB limited storage.

- **QuickStart Cloud Installer (Red Hat Satellite)** is the evolution of Red Hat's life cycle management platform. The QuickStart Cloud Installer (QCI) provides an on-premise mirror of all entitled content found on the Red Hat Customer Portal. It also synchronizes with custom content repositories, the Puppet Forge, and local GIT repositories. The QuickStart Cloud Installer provides a comprehensive work flow designed to package, version, and configure a complete Linux application stack. The work flows include host provisioning on a variety of compute resources, including bare-metal, Red Hat Virtualization, Red Hat OpenStack Platform, VMware, and EC2. The QuickStart Cloud Installer tracks the arrival of critical errata and guides administrators through the use of dashboards and notifications in the task of keeping Linux hosts patched and protected from exploits and service-affecting incidents. Managed hosts register with the QuickStart Cloud Installer for updates and configuration services, which are locally administered by a distributed network of Red Hat Satellite Capsule Servers.

**WARNING**

The QuickStart Cloud Installer has reached end of life and is no longer supported.

- **Red Hat Enterprise Linux for Virtual Datacenters** is meant for a virtualized environment on supported hypervisors, and is deployed on systems that are sized by the socket pair. Each socket pair subscription comes with an unlimited number of guests that can be run on Red Hat Virtualization, VMware, or Microsoft HyperV. These subscriptions are also stackable and can be purchased with Standard or Premium Support.

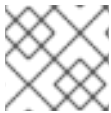
Red Hat Insights is a new service available in the Red Hat products as an add-on feature that uses the collective knowledge to help end-users proactively diagnose systems and avoid critical downtime situations. Red Hat Access Insights does this by having systems periodically check in similar to Red Hat Subscription Management.

Smart Management Add-On for Red Hat Enterprise Linux, when coupled with QuickStart Cloud Installer (Red Hat Satellite), makes it possible for you to manage the complete life cycle of your Red Hat Enterprise Linux systems. The Smart Management Add-On is a subscription that allows you to provision, update, configure your environment. It also allows you to automate routine tasks, such as errata management.

2.2. SUPPORTABILITY MATRIX

To check which versions of the products you can use together for the best results, use [Cloud Deployment Planner](#). Select a version for two or more products you want to deploy. Scroll down to see the **Feature Compatibility** list between the selected products. Click the **Lifecycle Compatibility** tab to

check the support duration for individual products. Red Hat Cloud Infrastructure does not have a master lifecycle support policy. Each product is supported based on its individual lifecycle support policy.

**NOTE**

Red Hat Cloud Infrastructure is only supported on Red Hat Satellite 6.

Refer to the following links for specific feature compatibility:

- Identity Management: <https://access.redhat.com/cloud-deployment-planner/#/matrix/identity-management>
- Configuration Management: <https://access.redhat.com/cloud-deployment-planner/#/matrix/configuration-management>
- Provisioning: <https://access.redhat.com/cloud-deployment-planner/#/matrix/provisioning>
- Management: <https://access.redhat.com/cloud-deployment-planner/#/matrix/management>
- Predictive Analysis: <https://access.redhat.com/cloud-deployment-planner/#/matrix/predictive-analysis>
- Storage: <https://access.redhat.com/cloud-deployment-planner/#/matrix/storage>

2.3. INTEGRATING RED HAT CLOUD INFRASTRUCTURE INTO EXISTING INFRASTRUCTURE

Red Hat Cloud Infrastructure makes it possible to use an existing infrastructure to connect to features from other open source or proprietary solutions. This means that you can add new peripheral technologies to Red Hat Cloud Infrastructure or use the following technologies you already have on site:

Storage

You can use storage features built into Red Hat Enterprise Linux or other third-party products that offer NFS, iSCSI, or fibre channel storage.

Authentication

Red Hat Virtualization provides support for authentication without requiring additional authentication services.

Red Hat Virtualization also supports centrally-managed network authentication such as Red Hat Identity Management, Microsoft Active Directory, Red Hat Directory Server 9, or other LDAP-based authentication (such as OpenLDAP). Red Hat CloudForms, however, currently supports only local (admin user) or Active Directory authentication when requesting services from Red Hat Virtualization.

Software Management

QuickStart Cloud Installer (Red Hat Satellite) makes it possible to automate and manage deployments, manage ongoing software updates for a variety of virtualization and cloud infrastructure.

Third-Party Virtualization and Cloud Providers

If you are currently running virtual machines in virtualization or cloud environments such as VMware

vCenter or Microsoft Hyper-V Server, you can begin using Red Hat CloudForms to manage those environments, along with your Red Hat Virtualization and Red Hat OpenStack Platform providers. This allows you to manage all of your cloud providers from the one console and in a consistent way.

CHAPTER 3. HOW TO GET STARTED

3.1. INSTALLATION USING THE QUICKSTART CLOUD INSTALLER (END OF LIFE)

See <https://access.redhat.com/articles/2993441> for more information.

3.2. STANDARD MANUAL INSTALLATION OF INDIVIDUAL PRODUCTS

See the [Standard installation of individual products](#) tab for more information.

APPENDIX A. ADDITIONAL RESOURCES

You can find more detailed information on the products in Red Hat Cloud Infrastructure as follows:

- [Customer Portal](#)
- [Red Hat OpenStack Platform](#)
- [Red Hat Virtualization](#)
- [Red Hat CloudForms](#)
- [Red Hat Satellite](#)
- [Red Hat Ceph Storage](#)

APPENDIX B. CHOOSING BETWEEN RED HAT VIRTUALIZATION AND RED HAT OPENSTACK PLATFORM

Red Hat Virtualization and Red Hat OpenStack Platform provide many of the same features, so it may be difficult to know which to choose to handle your workloads. This section explains some of the differences between the two to help you decide.

Is it harder to configure Red Hat Virtualization or harder to configure Red Hat OpenStack Platform?

Red Hat Virtualization is easier to configure, but it provides less flexibility than Red Hat OpenStack Platform does. Most of the services necessary for managing the Red Hat Virtualization environment are built into the Red Hat Virtualization Manager. Services in Red Hat OpenStack Platform can be divided up in many different ways and spread across multiple systems. This makes the initial setup of Red Hat Virtualization easier than the initial setup of Red Hat OpenStack Platform, but it means that in Red Hat Virtualization, it is more difficult to disperse management services across multiple manager nodes. Red Hat OpenStack Platform offers more flexibility in configuration, compared to Red Hat Virtualization. One way that Red Hat OpenStack Platform offers more flexibility is by spreading services across multiple controller nodes. Keeping track of those services is one of the costs of the comparative flexibility of Red Hat OpenStack Platform.

Is Red Hat Virtualization or Red Hat OpenStack Platform better for running customized virtual machines?

Red Hat Virtualization is better for running customized virtual machines, such as desktop installations. Red Hat OpenStack Platform is best suited for generic virtual machines that change little but must be deployed many times.

Is Red Hat Virtualization or Red Hat OpenStack Platform better suited to supporting the lifespan of my virtual machine?

Red Hat Virtualization is better suited for supporting long-lived virtual machines. Red Hat OpenStack Platform is better-suited for hosting virtual machines that support a task, are discarded, and are spun up again when needed.

Both Red Hat Virtualization and Red Hat OpenStack Platform can handle the workloads described here, but Red Hat Virtualization is better suited to some tasks and Red Hat OpenStack Platform is better suited to others. For instance, an organization might choose to configure Red Hat CloudForms to orchestrate a system in which Red Hat Virtualization provides virtual desktop systems and Red Hat OpenStack Platform runs internal web mail and employee information services.