CloudStack and CloudPortal Business Manager Features

For CloudStack Version 3.0 and CloudPortal Business Manager Version 1.3

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# What Is CloudStack?

CloudStack™ is an open source software platform that pools computing resources to build public, private, and hybrid Infrastructure as a Service (IaaS) clouds. CloudStack manages the network, storage, and compute nodes that make up a cloud infrastructure. Use CloudStack to deploy, manage, and configure cloud computing environments.

Typical users are service providers and enterprises. With CloudStack, you can:

* Set up an on-demand, elastic cloud computing service. Service providers can sell self‑service virtual machine instances, storage volumes, and networking configurations over the Internet.
* Set up an on-premise private cloud for use by employees. Rather than managing virtual machines in the same way as physical machines, with CloudStack an enterprise can offer self-service virtual machines to users without involving IT departments.



# What Can CloudStack Do?

**Multiple Hypervisor Support**

CloudStack works with a variety of hypervisors. A single cloud deployment can contain multiple hypervisor implementations. You have the complete freedom to choose the right hypervisor for your workload. CloudStack is designed to work with open source Xen and KVM hypervisors as well as enterprise-grade hypervisors such as Citrix XenServer, VMware vSphere, and Oracle VM (OVM).

**Massively Scalable Infrastructure Management**

CloudStack can manage tens of thousands of servers installed in multiple geographically distributed datacenters. The centralized management server scales linearly, eliminating the need for intermediate cluster-level management servers. No single component failure can cause cloud-wide outage. Periodic maintenance of the management server can be performed without affecting the functioning of virtual machines running in the cloud.

**Automatic Configuration Management**

CloudStack automatically configures each guest virtual machine’s networking and storage settings.

CloudStack internally manages a pool of virtual appliances to support the cloud itself. These appliances offer services such as firewalling, routing, DHCP, VPN access, console proxy, storage access, and storage replication. The extensive use of virtual appliances greatly simplifies the installation, configuration, and on-going management of a cloud deployment.

**Graphical User Interface**

CloudStack offers an administrator's Web interface, used for provisioning and managing the cloud, as well as an end-user's Web interface, used for running VMs and managing VM templates. The UI can be customized to reflect the desired service provider or enterprise look and feel.

**API and Extensibility**

CloudStack provides an API that gives programmatic access to all the management features available in the UI. The API is maintained and documented. This API enables the creation of command line tools and new user interfaces to suit particular needs. See the Developer’s Guide and API Reference, both available at <http://docs.cloud.com/CloudStack_Documentation>.

The CloudStack platform pluggable allocation architecture allows the creation of new types of allocators for the selection of storage and Hosts. See the Allocator Implementation Guide (<http://docs.cloud.com/CloudStack_Documentation/Allocator_Implementation_Guide>).

**High Availability**

The CloudStack platform has a number of features to increase the availability of the system. The Management Server itself may be deployed in a multi-node installation where the servers are load balanced. MySQL may be configured to use replication to provide for a manual failover in the event of database loss. For the Hosts, the CloudStack platform supports NIC bonding and the use of separate networks for storage as well as iSCSI Multipath.

# Cloud Infrastructure

* **Software and Hardware.** A CloudStack installation consists of two parts: the CloudStack Management Server software and the cloud infrastructure that it manages, including resources such as hosts, storage devices, and IP addresses.
* **Networking models.** CloudStack offers two types of networking scenario: basic and advanced. Basic networking provides AWS-style networking with a single network where guest isolation can be provided through layer-3 means such as security groups (IP address source filtering). Advanced networking is for more sophisticated topologies and provides flexibility in defining virtual guest networks.
* **Physical Network Management.** A physical network is the actual network hardware and wiring in a zone. A zone can have multiple physical networks. CloudStack lets administrators add/remove/update physical networks, configure VLANs, add firewalls and load balancers, configure IP addresses, set network speed, and set the type of traffic carried on the physical network (guest VM traffic, Internet traffic, CloudStack internal traffic, and more).
* **Virtual Networks.** A virtual network is a logical construct that enables multi-tenancy on a single physical network. In CloudStack, a virtual network can be shared or isolated. An isolated network can be accessed only by virtual machines of a single account. A shared network can be accessed by virtual machines that belong to many different accounts. Network Isolation on shared networks is accomplished using techniques such as security groups.
* **Storage.** CloudStack works with iSCSI and NFS servers, local disk storage, and OpenStack Object Storage (Swift).
* **Security.** CloudStack uses SSH keys, an API secret key, VPN passwords, a CloudStack database password, and compute node root passwords to ensure security. All these sensitive passwords and secret keys are automatically encrypted.

# User Services

In addition to the physical and logical infrastructure of your cloud, and the CloudStack software and servers, you also need a layer of user services so that people can actually make use of the cloud.

* **End-user UI.** Users can view and manage their VMs and other resources.
* **Virtual Machines.** Hosts in a CloudStack deployment run hypervisor software and provide the computing resources to run guest virtual machines for end users. Guest VMs can communicate with each other using shared infrastructure with the security and user perception that the guests have a private LAN. End users and administrators can stop, start, reboot, and destroy VMs. Ingress and egress rules can be defined to control network traffic to and from the VMs.
* **Offerings.** A user creating a new virtual machine instance can make a variety of choices about its characteristics and capabilities. CloudStack provides several ways for cloud administrators to present users with choices when creating a new instance, including VM templates to determine the OS and other installed apps, data disk size, CPU speed, network features, and more.
* **Usage Tracking.** Commercial clouds can record what services and resources users are consuming and charge them for that usage.
* **Projects.** CloudStack users can group themselves into projects so they can collaborate and share virtual resources. CloudStack tracks usage per project as well as per user, so the usage can be billed to either a user account or a project.
* **LDAP Authentication.** An external LDAP server such as Microsoft Active Directory or ApacheDS can be used for end-user authentication.
* **Network Management.** End users can acquire IP addresses from the available pool, create firewall rules and load balancer rules, and create new guest networks.

# What Is CloudPortal Business Manager?

CloudPortal Business Manager™ (CloudPortal) is a purpose-built Business/Operational Support System (B/OSS) platform that enables Service Providers to quickly get to market with an Infrastructure-as-a-Service (IaaS) cloud that has been built on the CloudStack™ platform.

CloudPortal is an enterprise grade operations support platform that comes integrated out-of-the-box with CloudStack. CloudPortal includes standard modules and components for Account Management, Pricing & Billing, CRM, and Reporting that can be quickly implemented for public cloud initiatives.



## Account Provisioning Features

* Self-registration supported for customers
* Assisted registration for service provider personnel to manually create customer accounts

## Account Management Features

* View and modify account information
* Users can create personal profiles
* Login, logout, and password reset functionality

## Products, Catalogs, and Price Management Features

* Create and manage multiple Product Catalogs and Product Bundles
* Create different billing scenarios with a combination of straight utility metering, included usage level entitlements, one-time setup fees, periodic subscription renewal fees, and annual fees
* Set different prices in different catalogs
* Support for Channel-Catalog affinity to enable partner-based selling channels
* Utility Rate Card for straight usage-based billing
* Subscription Management

## Billing Features

* Store customer’s raw and rated spend information by billing period
* Mediation Engine - a dedicated server component that transforms raw usage data from CloudStack into business-aware data that can be rated and converted to monetary value
* Subscription-based and Utility billing models
* Tax module
* Periodic billing runs generate customer invoices
* Refunds through either account credits or credit card chargeback
* Payment processing using credit card through secure gateway
* Customer can view progressive spend and credit balance, view invoices by billing period, make payment for a specific invoice, and update payment card details

## Customer Relationship Management Features

* Manage customer account information
* View, submit, and comment on trouble tickets
* Masquerade as the customer and take actions on behalf of the customer's account, such as filing a trouble ticket or resetting a lost password
* Report on customer activity and usage

## Resource Usage Monitoring Features

* Customers can allocate and manage budgets and receive alerts when spend limits are approached
* Customer resource usage can be viewed by customers, their users, and service provider personnel
* Prominent dashboard meter displays running total of usage

## Reporting Features

* New Customer Registrations report
* Top Customers ranked by total spend to date
* Monthly Usage per Product compares usage of VMs, network bytes, etc.
* Monthly Usage by Product Bundle compares usage levels in customer subscriptions to various bundles
* Export reports to CSV, PDF, JPG, or Email
* Filter by date

## User Provisioning Features

* Create logins for users within the Service Provider organization or in a customer account
* Security profiles for assigning permissions to ensure users access the appropriate resources and data
* Store and modify contact details and profile photos

## Administrator Accounts

* The ROOT profile is a set of security permissions that provide maximum flexibility to the initial user of CloudPortal. Other users at the service provider must be created by this user, or by a user created by Root.
* The PORTAL user is not a real person. It is used by CloudPortal for internal actions. You will likely see this user referred to in notifications and logs.
* The SERVICE account contains the service provider's own users and information.

## Portal Administration Features

* Dashboard provides overview of infrastructure resource usage, service health, customer activity, and notifications.
* Configuration properties provide a way for authorized users to modify the behavior of CloudPortal modules including reports, billing, handling of delinquent payments, destination of alert email, triggers for automated email, and more.
* Ability to suspend batch jobs during maintenance.

## Content and Messaging Features

* Alerts and notifications triggered by events related to usage and spend levels, account status, customer payment failures, and service health
* Authorized users can publish updates on events such as scheduled maintenance, disruptions, and issues
* Customizable templates for outbound email
* Basic Internationalization framework

## Security Features

CloudPortal provides a variety of security mechanisms to ensure that only authorized persons gain access to data.

* A payment gateway ID for each customer is used to securely exchange data with the payment gateway. All credit card information is stored by the gateway provider, not in the CloudPortal database.
* The CAPTCHA challenge-response test is used to ensure that new account requests are submitted by actual living persons.
* Encryption is applied to all sensitive data in the CloudPortal databases such as email addresses and passwords. These values are encrypted using Advanced Encryption Standard standard AES-128.
* The Salesforce ID is encrypted using AES-128.
* It is also possible to encrypt the values in the cloud.properties configuration file, such as database passwords, using AES-128.
* The encryption key is stored in a properties file, which can also be encrypted.

## Reliability Features

* Ability to run multiple CloudPortal server instances
* Use with load balancer to manage system stress
* MySQL databases use InnoDB storage engine for greater data integrity and reliability

## Customization Features

* Componentized for UX and functional customizations
* API support using XML over HTTP(S)
* Email templates can be modified to customize automatically generated email
* Terms of Service link can be configured to your own organization's ToS

## Integrations

* Fully integrated with CloudStack. Notifications and usage data from CloudStack provided in CloudPortal UI. Quick access to full CloudStack infrastructure in administration UI.
* Salesforce.com Service Cloud integration provides trouble ticketing functionality
* Authorize.net payment gateway integration for financial transaction processing
* Single sign-on supported for Liferay enterprise portal platform