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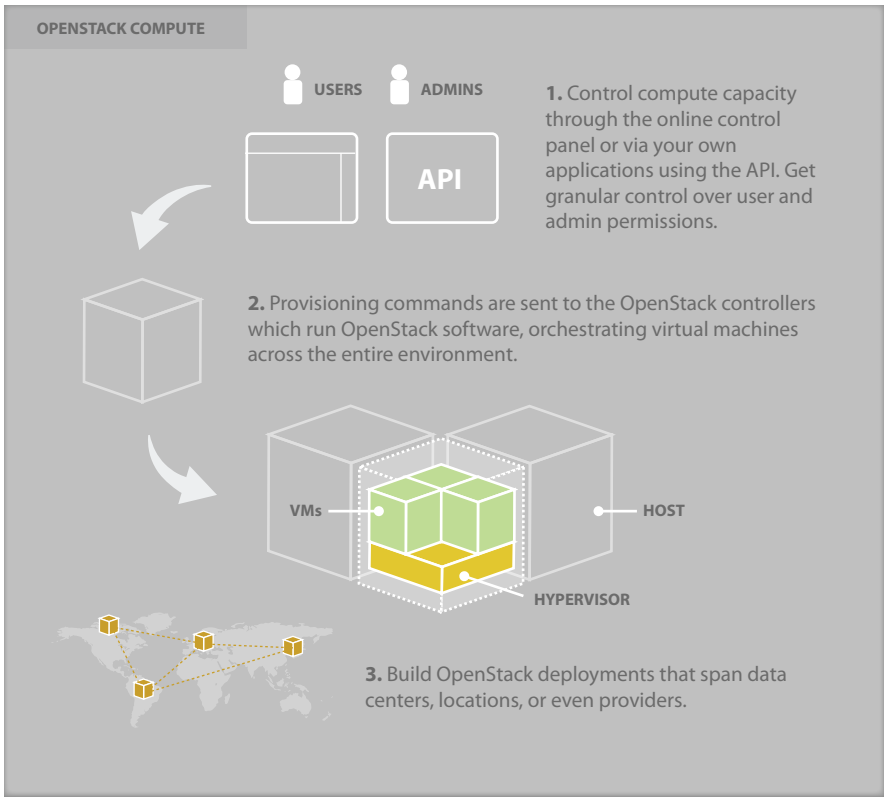
OpenStack Compute: An Overview

What is OpenStack Compute?

OpenStack Compute is open source software designed to provision and manage large networks of virtual machines, creating a redundant and scalable cloud computing platform. It gives you the software, control panels, and APIs required to orchestrate a cloud, including running instances, managing networks, and controlling access through users and projects. OpenStack Compute strives to be both hardware and hypervisor agnostic, currently supporting a variety of standard hardware configurations and seven major hypervisors.



Popular Use Cases

Service providers offering an IaaS compute platform

IT departments provisioning compute resources to teams and projects

Processing big data with tools like Hadoop

Scaling compute up and down to meet demand for web resources and applications

OpenStack Overview

OpenStack is open source software to build private and public clouds. There are three main components:

OpenStack Compute: provision and manage large networks of virtual machines

OpenStack Object Store: Create petabytes of reliable storage using standard servers

OpenStack Glance: Catalog and manage large libraries of server images

Why OpenStack?

- Control and Flexibility. Open source platform means you're never locked to a proprietary vendor, and modular design can integrate with legacy or third-party technologies to meet your business needs. Hypervisor support for Microsoft Hyper-V, Citrix XenServer, Xen, KVM, VMWware ESX, LXC, QEMU, and UML.
- Industry Standard. More than 60 leading companies from over a dozen countries are participating in OpenStack, including Cisco, Citrix, Dell, Intel and Microsoft, and new OpenStack clouds are coming online across the globe.
- Proven Software. Running the OpenStack cloud operating system means running the same software that today powers some of the largest public and private clouds in the world.
- Compatible and Connected. Compatibility with public OpenStack clouds means enterprises are prepared for the future-making it easy to migrate data and applications to public clouds when conditions are right—based on security policies, economics, and other key business criteria.

The OpenStack project is provided under the Apache 2.0 license.

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OpenStack Compute: The Best Solution For...

Service Providers

Base your cloud offering on the open industry standard and provide your customers the latest technology advances

Free open source software means no licencing fees and reduced cost of ownership

Flexible, open source software makes it easy to differentiate your offering with extensions and modifications

Strong OpenStack API ecosystem means compatible tools

Also Supports Amazon EC2 and S3 APIs for an easy migration path

Billing integration hooks help track customer usage

Includes reference control panel for rebranding or integration

Includes reference iOS and Android applications for rebranding

Pluggable authentication mechanism for SSO integration

Multi-zone support allows separate, redundant cloud environments to be created that can provide additional levels of available and fault tolerance

Ability to migrate workloads across common platform

Enterprises

Enables you to realize the benefits of cloud while meeting all your organizations regulatory, compliance and security requirements

Reduces cost of ownership by consolidating physical machines to virtual machines

Compatibility with public OpenStack clouds makes it easy to migrate data and applications to public clouds when conditions are right—based on security policies, economics, and other key business criteria.

Control panels that make it easy to move these workloads between data centers, and even different service providers

Self-service portal reduces procurement and hardware setup times

Modular design, broad hypervisor and volume support leverages existing infrastructure and allows for third-party integration

iOS and Android application support allows mobile management

Free open source software means no licencing fees and reduced cost of ownership

Integration hooks to track usage for departmental chargebacks

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OpenStack Compute: Detailed Feature List

Feature	Details
Multi- Tenancy	All facets of the compute platform are inherently multi-tenant. This includes billing, logging, auditing, and end-user control panel. Multi-tenancy was an initial feature requirement of OpenStack Compute, not something added as a bolt-on feature after the fact.
Massive Scalability	OpenStack Compute scales to thousands of compute nodes. Its shared-nothing design approach means it can continue to scale where other compute solutions can't.
EC2 Support	EC2 API support eases customer migration, and allows end-users to continue to use legacy EC2 APIs to manage their solution until they can take advantage of the advanced functionality of the native OpenStack API.
Multiple Network Models	The OpenStack Compute project support a number of pluggable back-end networking drivers. **VLAN**: instances are configured on a private network on a per-customer VLAN. An OpenVPN gateway device provides access to the private network and manages public NAT. **FlatDHCP**: Public IP addresses are shared from a pool of IP addresses. Instance IP addresses are controlled via a DHCP server running on the host. **Flat**: Public IP addresses are assigned from a pool of IP addresses. IP addresses can be "injected" into the client machine, or can be DHCP managed by an external DHCP infrastructure.
Pluggable Authentication	A pluggable authentication system makes it possible to easily integrate an existing authentication system. Currently implemented backends include: Local Auth: Standalone internal authentication system LDAP: Example authentication module that integrates with a LDAP backend
Block Storage Support	A variety of block storage options are available as a supplementary (non-boot) volume: **AOE**: ATA over Ethernet **IET iSCSI**: Provisions IET iSCSI volumes from a configurable **LVM volume RBD**: Rados Block Device, a network block device backed by objects in a Ceph distributed object store **Sheepdog**: A distributed storage system for KVM using commodity hardware **Solaris iSCSI**: iSCSI target running on Solaris/ZFS **HP SAN**: HP StorageWorks P4000 SAN target

OpenStack Compute: Detailed Feature List (continued)

Feature	Details
Control Panel	A modern, AJAX based web control panel suitable for rebranding is available with OpenStack Compute. This control panel application can be used as a customer-facing control panel, or used as a sample for integration with existing control panels. It is Django based, and can be hosted on Apache or other highly scalable web servers.
Android/iOS Clients	OpenStack compute includes reference Android and iOS clients. These applications can be used as-is, or rebranded to provide a provider-specific experience to customers.
Language Bindings	Multiple language bindings are available for both the legacy EC2 API, and the OpenStack APIs. In addition, most Rackspace Cloud Servers bindings will work against an OpenStack Compute installation as well.
Hypervisor Support	Many different hypervisors can be used as a back-end virtualization target for an OpenStack Compute custer: Xen/XenServer KVM Hyper-V VMWare/ESX Linux Containers (LXC) QEMU UML
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