

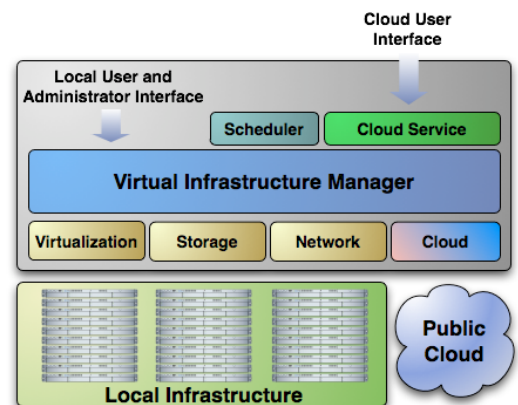
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Virtual Infrastructure Manager

The Open-Source Toolkit for Building Cloud Infrastructures

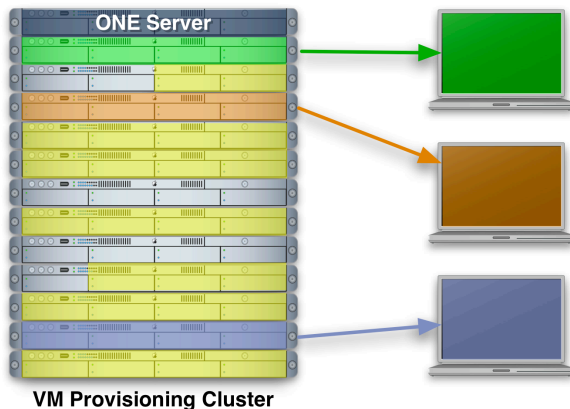
OpenNebula is a Virtual Infrastructure Manager that **orchestrates storage, network and virtualization technologies** to enable the **dynamic placement of multi-tier services** (groups of interconnected virtual machines) on distributed infrastructures, combining both **data center resources and remote cloud resources**, according to allocation policies.

OpenNebula is an open and flexible tool that can be used to build any type of Cloud deployment. OpenNebula can be used as a virtualization tool to manage your virtual infrastructure in the data-center or cluster, which is usually referred as **private cloud**. OpenNebula supports **hybrid clouds** to combine local infrastructure with public cloud-based infrastructure, enabling highly scalable hosting environments. OpenNebula also supports **public clouds** by providing Cloud interfaces to expose its functionality for virtual machine, storage and network management.



Benefits

OpenNebula leverages the functionality provided by the underlying virtualization platforms to provide the following **benefits on a multi-host environment**:



For the Infrastructure Manager

- **Faster respond** to infrastructure needs for services
- **Centralized management** of all the virtual and physical distributed infrastructure
- **Higher utilization** of existing resources
- **Operational saving** with server consolidation
- **Lower infrastructure expenses**

For the Infrastructure User

- **Faster delivery and scalability** of services
- Support for **heterogeneous execution environments**
- **Full control** of the virtualized services

For System Integrators

- **Fits into any existing data center**
- Build **any type of Cloud deployment**
- **Open source** software
- **Seamless integration** with any product and service in the virtualization/cloud ecosystem

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Features

The OpenNebula Virtual Infrastructure Manager differentiates from existing Cloud platforms in its highly modular and open architecture and interfaces to build any type of Cloud deployment. **The last version (v1.4) supports Xen, KVM and VMware platforms to provide the following features and capabilities:**

Feature	Function
Virtual Infrastructure Management	
Internal Interfaces for Administrators and Users	<ul style="list-style-type: none">• Unix-like CLI to manage VM life-cycle and physical boxes• XML-RPC API and libvirt virtualization API
Scheduler	<ul style="list-style-type: none">• Requirement/rank matchmaker allowing the definition of workload and resource-aware allocation policies• Support for advance reservation of capacity through Haizea
Virtualization Management	<ul style="list-style-type: none">• Xen, KVM and VMware connectors• Generic libvirt connector (VirtualBox planned for 1.4.2)
Image Management	<ul style="list-style-type: none">• General mechanisms to transfer and clone VM images
Network Management	<ul style="list-style-type: none">• Definition of isolated virtual networks to interconnect VMs
Service Management and Contextualization	<ul style="list-style-type: none">• Support for multi-tier services consisting of groups of inter-connected VMs, and their auto-configuration at boot time
Security	<ul style="list-style-type: none">• Management of users by the infrastructure administrator
Fault Tolerance	<ul style="list-style-type: none">• Persistent database backend to store host and VM information
Scalability	<ul style="list-style-type: none">• Tested in the management of medium scale infrastructures with hundreds of servers and VMs
Installation	<ul style="list-style-type: none">• Installation on a UNIX cluster front-end without requiring new services in the remote resources• Distributed in Ubuntu 9.04 (Jaunty Jackalope)
Flexibility and Extensibility	<ul style="list-style-type: none">• Open and flexible architecture and interfaces, open source software, allowing its integration with any product or tool in the ecosystem
Hybrid Cloud Computing	
Cloud Plugins	<ul style="list-style-type: none">• Amazon EC2 and ElasticHosts connectors
Federation	<ul style="list-style-type: none">• Support for simultaneous access to several remote clouds
Flexibility	<ul style="list-style-type: none">• Modular approach to develop new connectors
Cloud Interfaces	
Cloud Interfaces for Users	<ul style="list-style-type: none">• Implementation of a subset of the EC2 Query API• RESERVOIR Cloud Interface and OGF OCCI planned for 1.4.2
Extensibility	<ul style="list-style-type: none">• The Cloud Service allows the implementation of new Cloud interfaces



OpenNebula is one of the technologies being enhanced in the Reservoir Project, flagship of European research initiatives in virtualized infrastructures and cloud computing (EU grant agreement 215605)