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# **The OpenNebula Virtual Infrastructure Engine**

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# The Vision – OpenNebula Engine

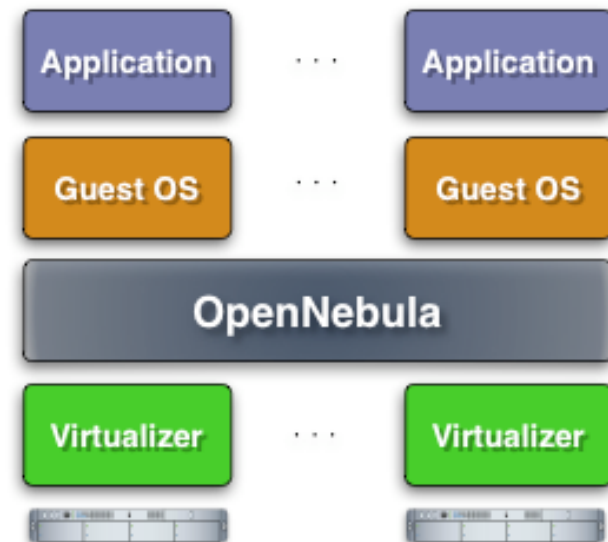
*The OpenNebula VM Manager*

OpenNebula is an **open source virtual infrastructure engine** that dynamically deploys and re-allocates virtual machines on a pool of physical resources

## Whom it may benefit

Anyone willing to use their infrastructure in a flexible manner, enabling the deployment of new services and the adjustment of their capacity

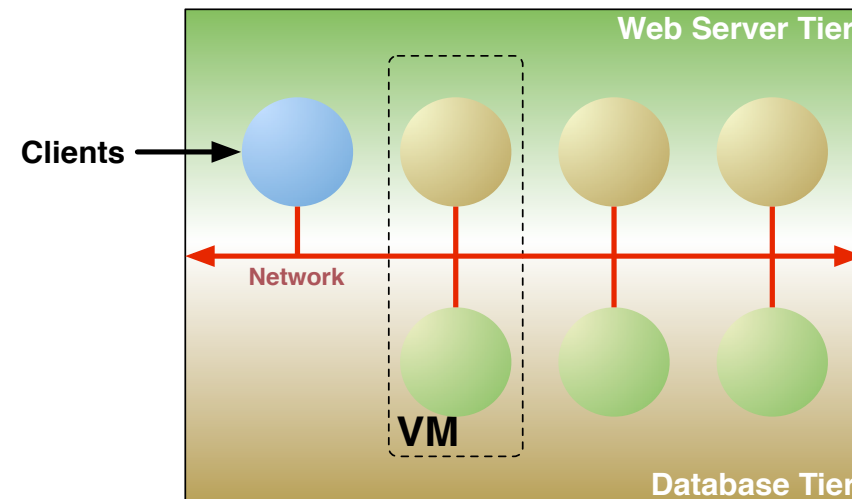
- Datacenters
- Cloud providers



# Virtual Machine Model

## *The OpenNebula VM Manager*

- The **service** as a first-class management entity
- Service **structure**
  - Service components run in VMs
  - Inter-connection relationship
  - Placement constraints
- The VM Manager is **service agnostic**
- However, it should provide **infrastructure context**





## Benefits

*The OpenNebula VM Manager*

### for the **System Manager**

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- Centralized management
- Balance of workload
- Server consolidation
- Dynamic resizing of the infrastructure
- Dynamic cluster partitioning
- Support for heterogeneous workloads

### for the **Service Manager**

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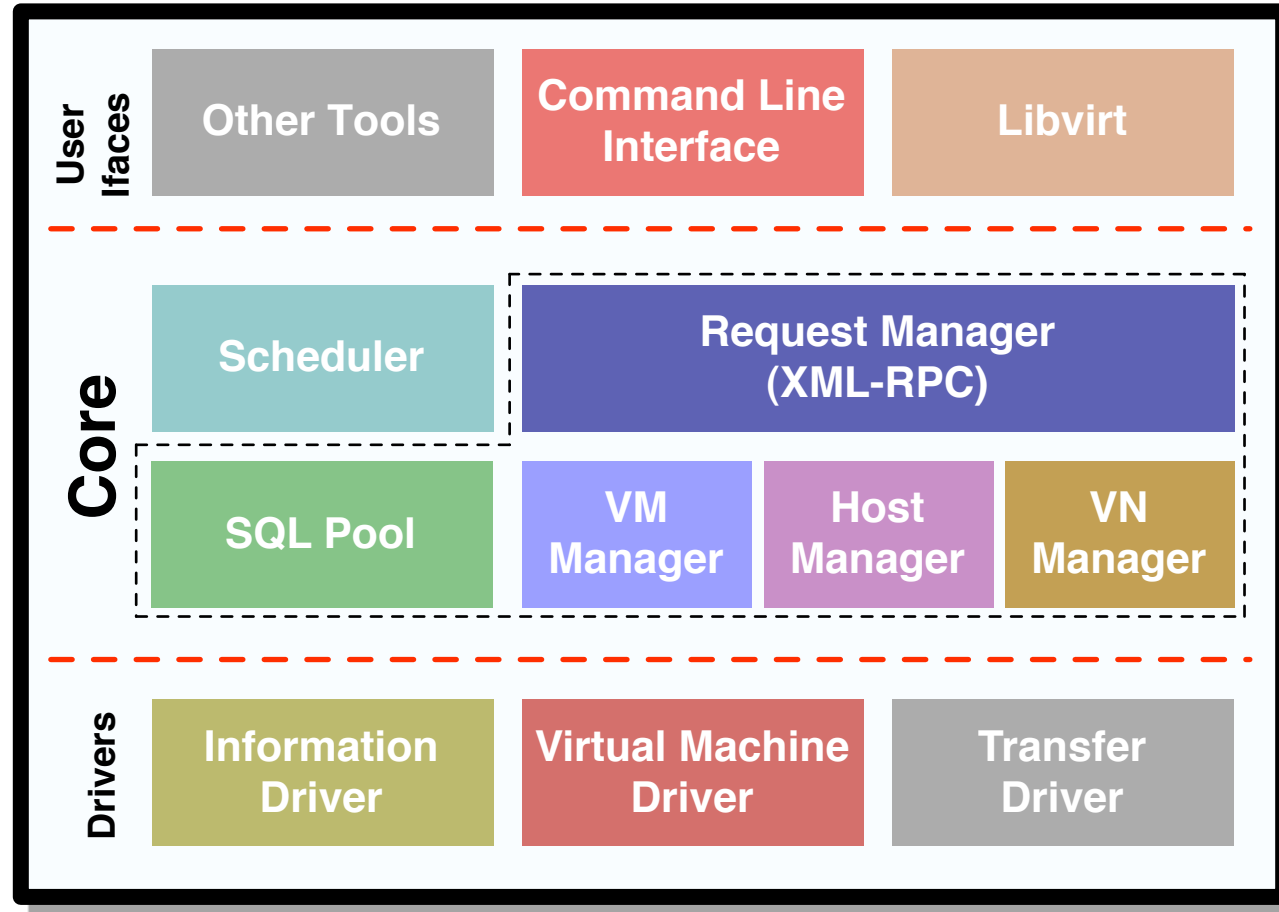
- On-demand provision of virtual machines



# Architecture

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# Use Cases

*The OpenNebula VM Manager*

## On-demand Scaling of Computing Clusters

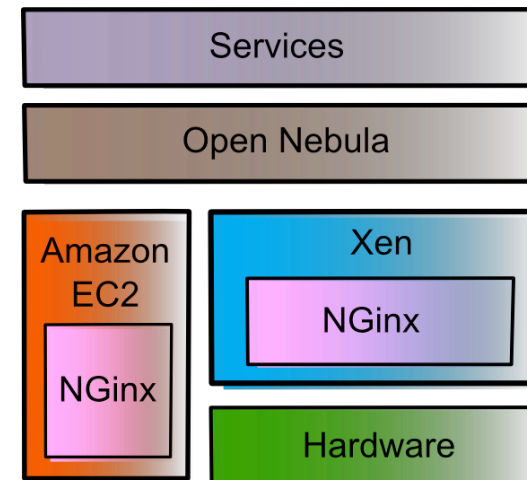
- OpenNebula allows a **physical** cluster to dynamically execute **multiple virtual** clusters



## Web Server

- A Web Server can be provisioned with additional nodes to meet fluctuating or peak demands

- **Nginx** as a load balancer
- **Nginx** as a web sever





# Ecosystem

*The OpenNebula VM Manager*

## Schedulers

- **Haizea:** open-source VM-based resource manager:

- allows Advance Reservation
- queuing of best-effort requests



- works as a drop-in replacement for OpenNebula scheduler

## Interfaces

- **Libvirt:** provides an abstraction of a whole cluster of resources as one host, hiding specific hypervisor details.
- **Nimbus:** can be used as a WSRF or EC2 front-end.

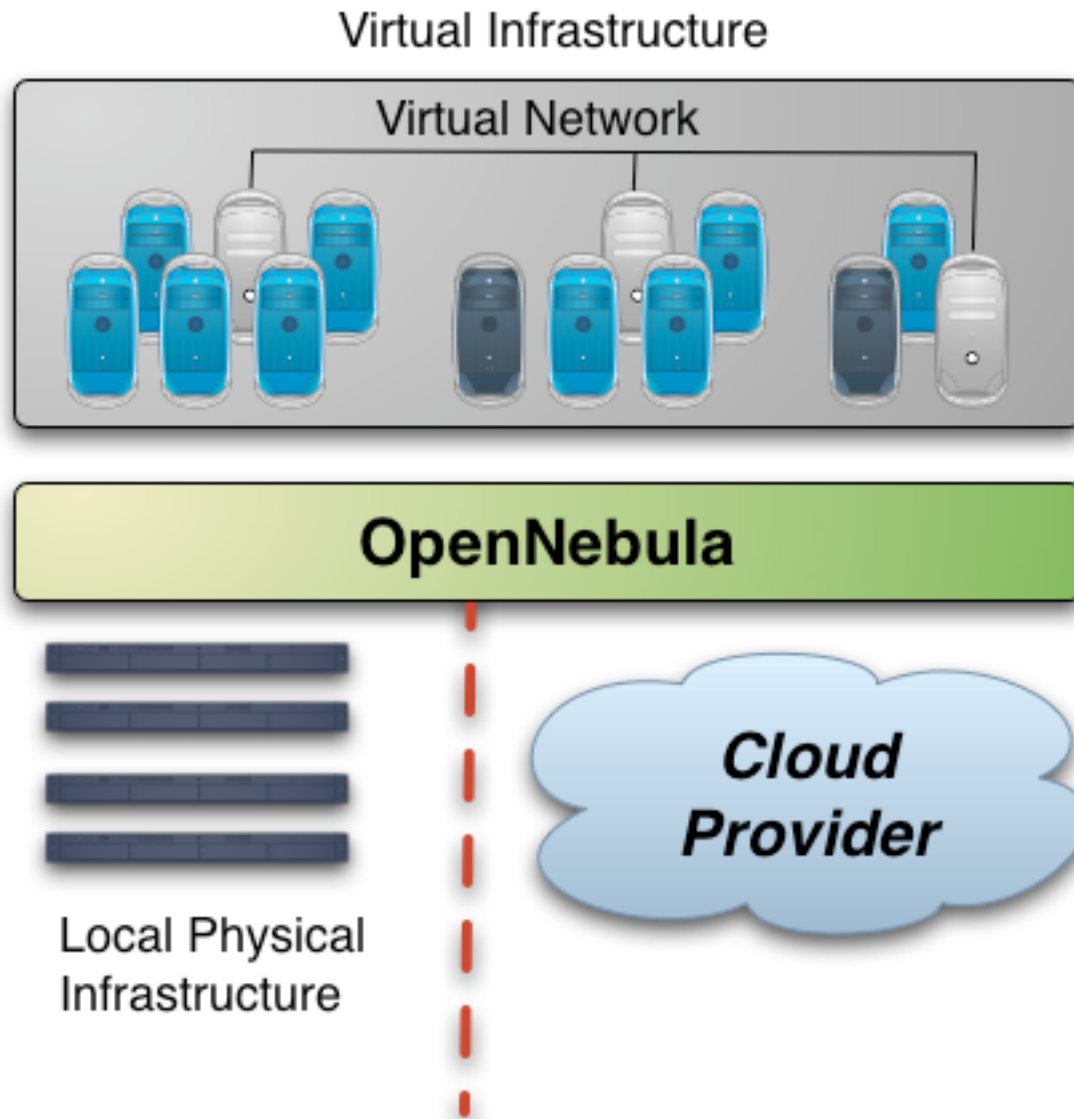
## Plug-Ins

- **ElasticHosts:** enables the dynamically increase capacity of your virtualized infrastructure to meet fluctuating peak demands using a cloud provider.

# Scaling SGE cluster with OpenNebula and EC2

*The OpenNebula VM Manager*

## Infrastructure Perspective

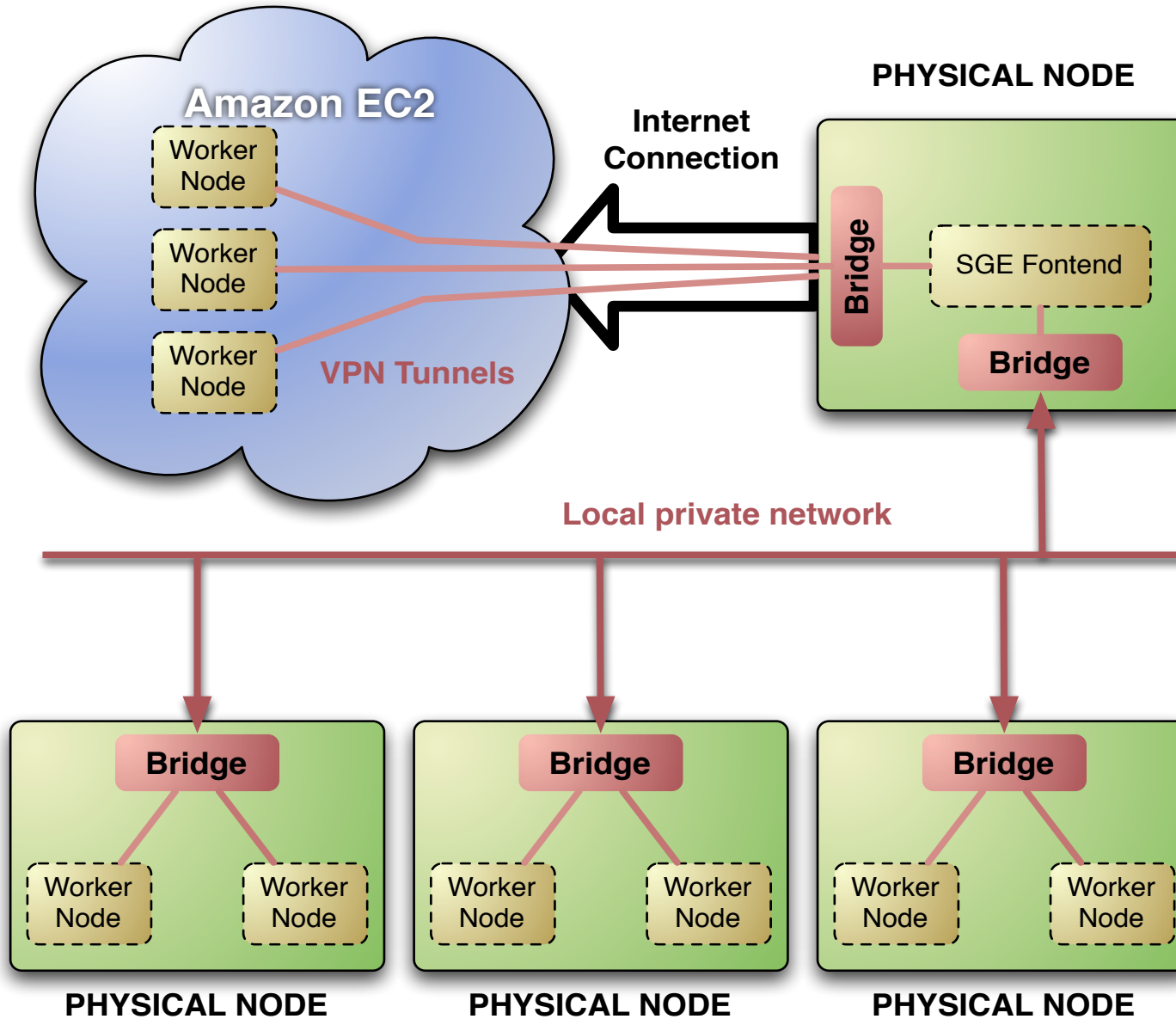




# Scaling SGE cluster with OpenNebula and EC2

The OpenNebula VM Manager

## Service Perspective





# The OpenNebula VM Manager

THANK YOU FOR YOUR ATTENTION!!!

More info, downloads, mailing lists at  
[www.OpenNebula.org](http://www.OpenNebula.org)

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[www.reservoir-fp7.eu/](http://www.reservoir-fp7.eu/)

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