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# Dynamic Management of Virtual Appliances with the OpenNebula Engine

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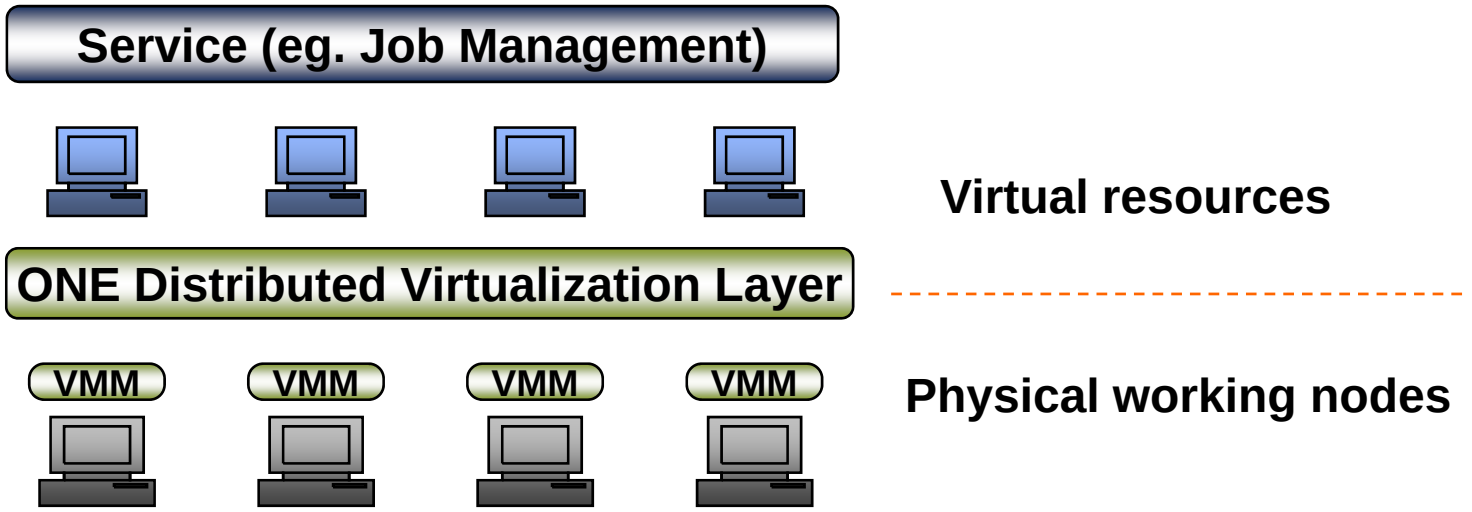
# The OpenNebula Engine

*Dynamic Management of Virtual Appliances with the OpenNebula Engine*

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

## A New Infrastructure Layer

- Separation of **Resource Provisioning from Service Management**
- **Seamless integration** with the existing middleware stacks.
- **Completely transparent** to the computing service and so end users



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# A Virtualized Infrastructure Layer for Grids

*Dynamic Management of Virtual Appliances with the OpenNebula Engine*

- Unmodified Applications (Grid or local)
- Interfaces preserved (qsub, DRMAA...)

**Applications**

**Meta-schedulers (GridWay, Condor/G…)**

- Virtual resources are exposed by GT
- Dynamic scheduling
- Fault detection & recovery

**gLite, UNICORE, Globus…**

**Grid Middleware Layer**

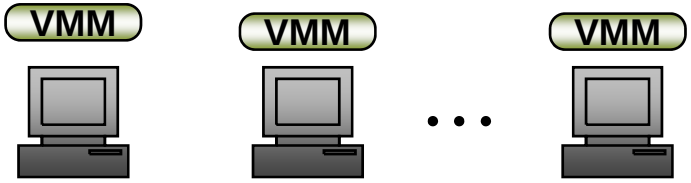
**Cluster Frontend (SGE)**

- WN images registers to a different queue

**Computing Service Layer**

**OpenNebula**

- **VO specific** appliances for the WNs
- **Coexist with other services**




**Infrastructure Layer**

# A Virtualized Infrastructure Layer for Grids

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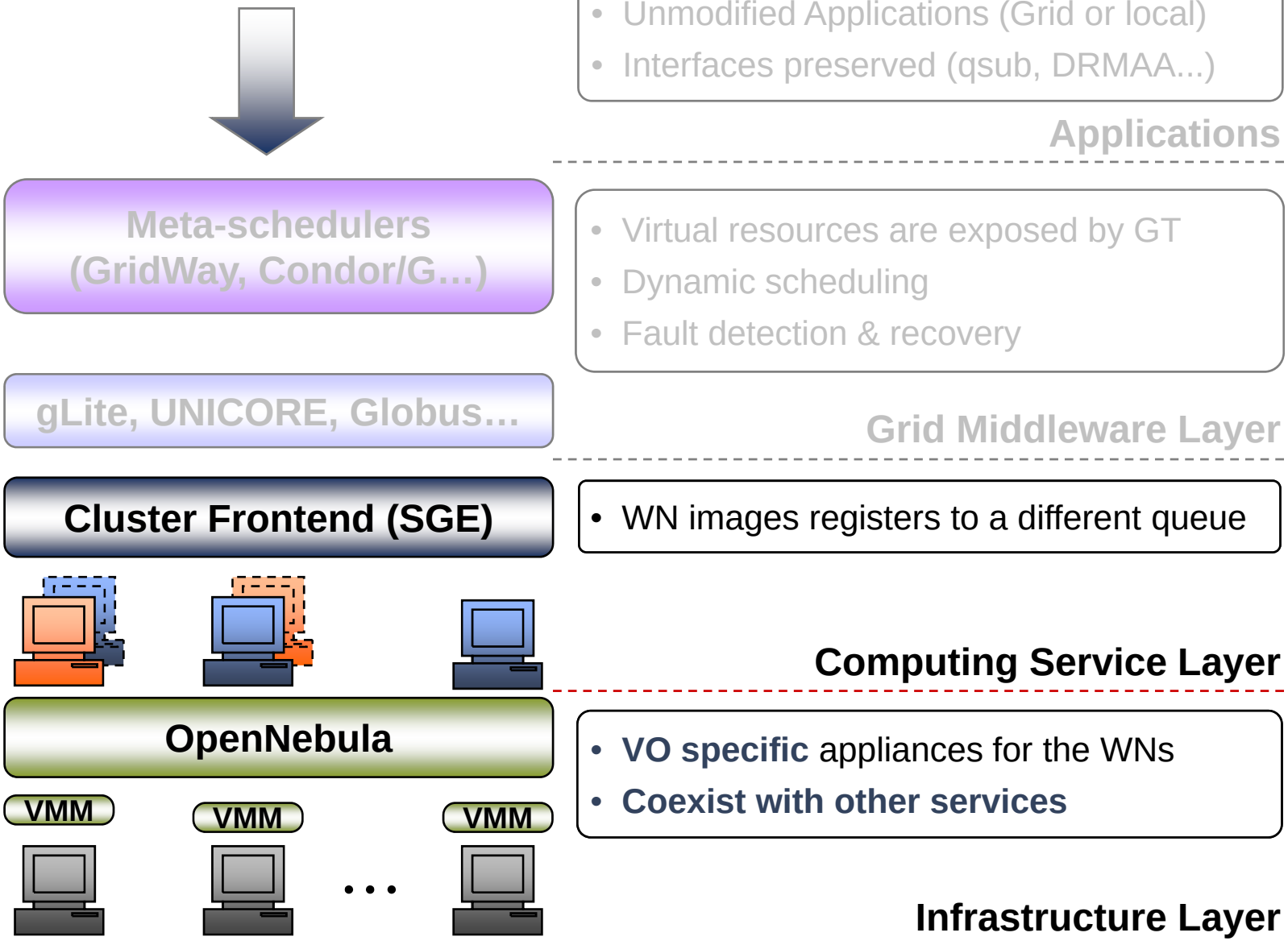

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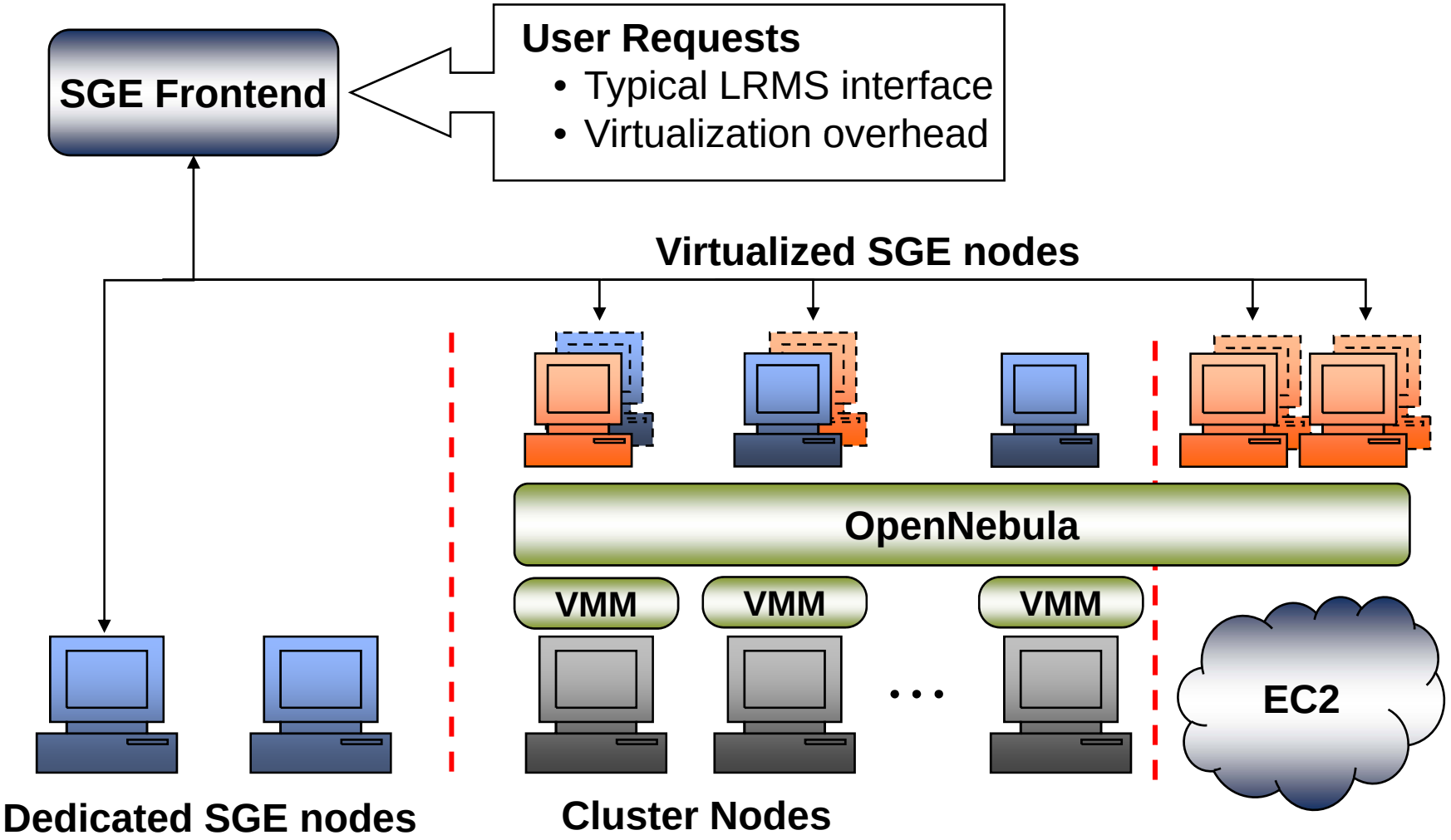
# An Elastic Computing Infrastructure

*Dynamic Management of Virtual Appliances with the OpenNebula Engine*



# An Elastic Computing Infrastructure

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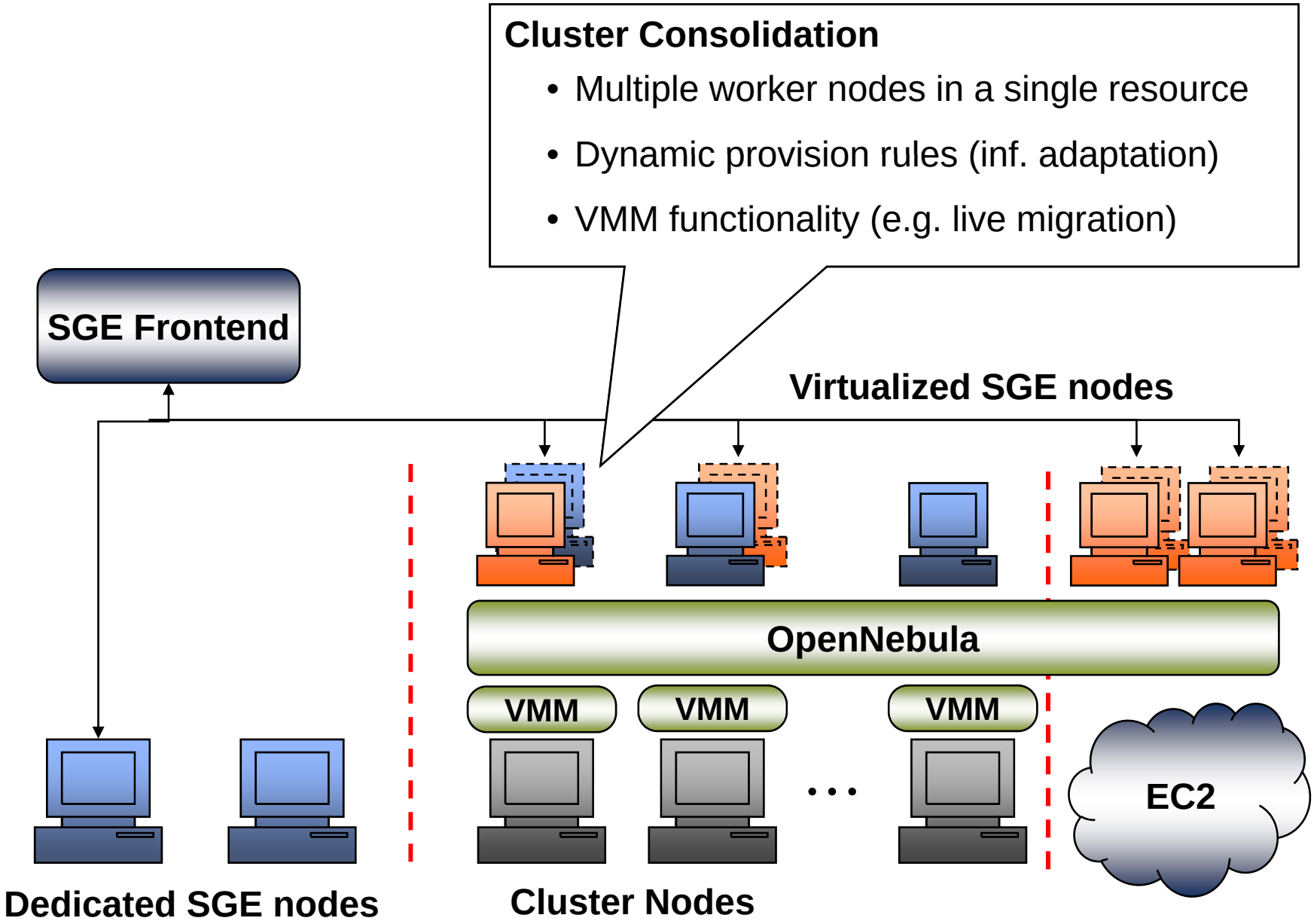

# An Elastic Computing Infrastructure

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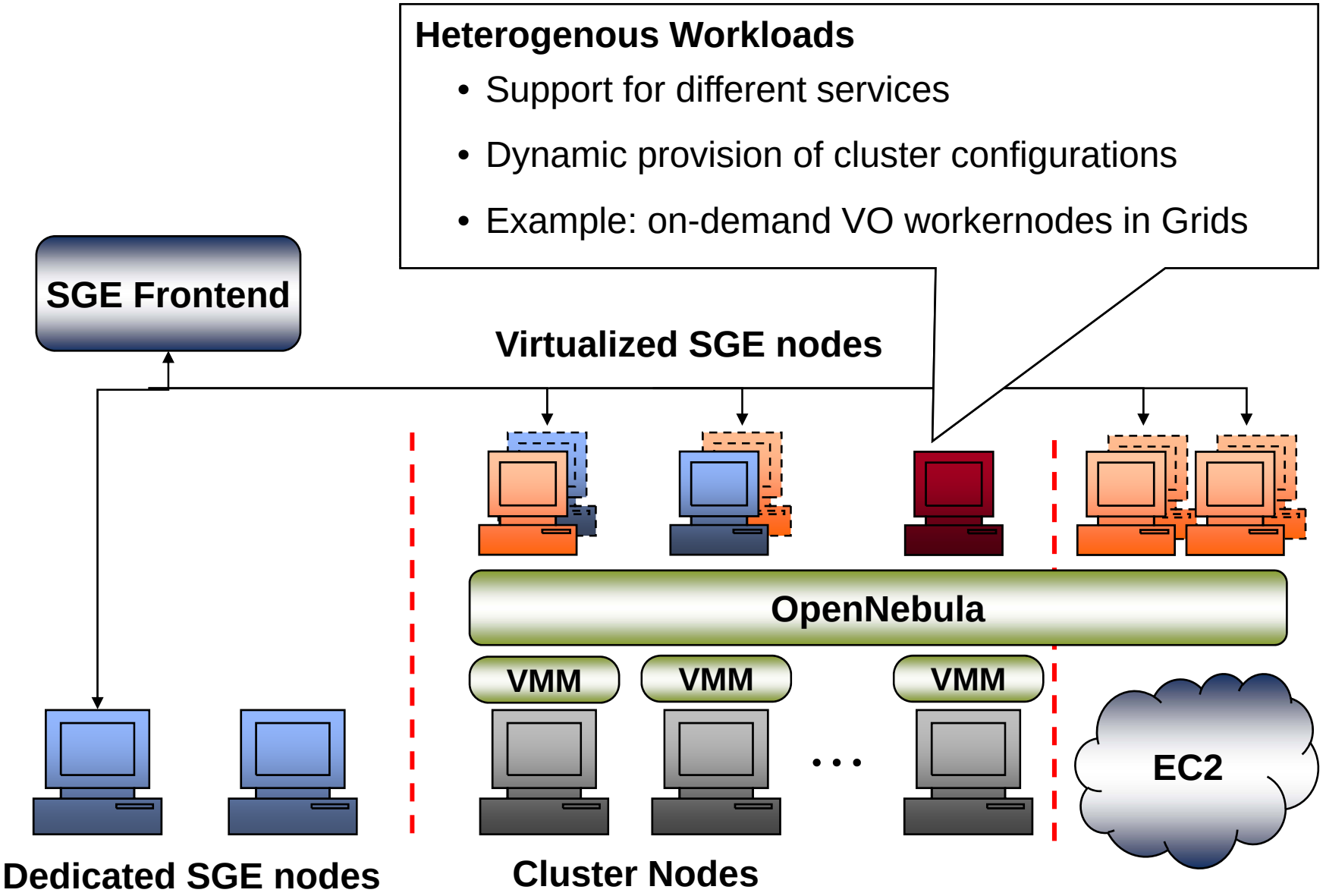
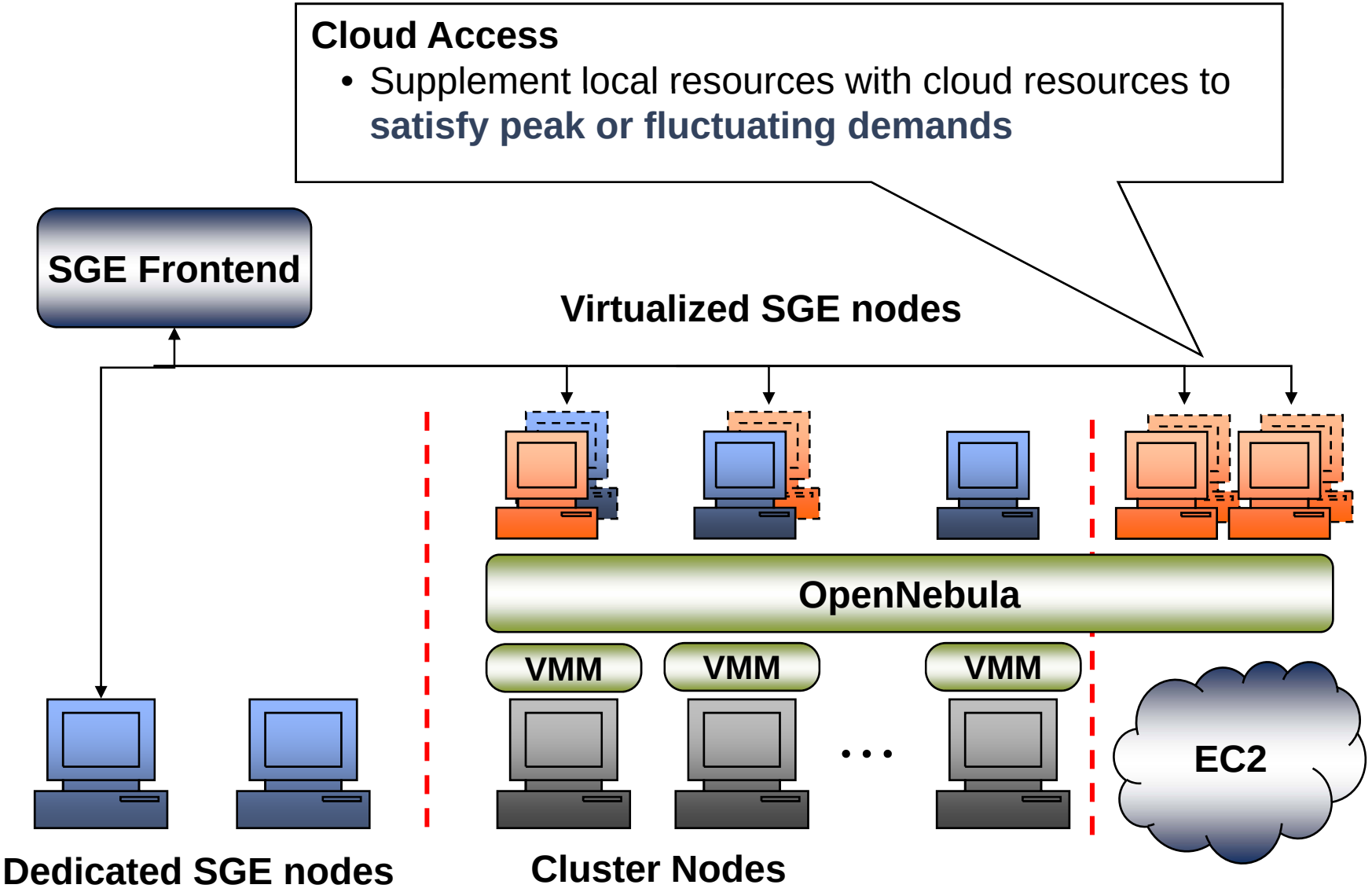
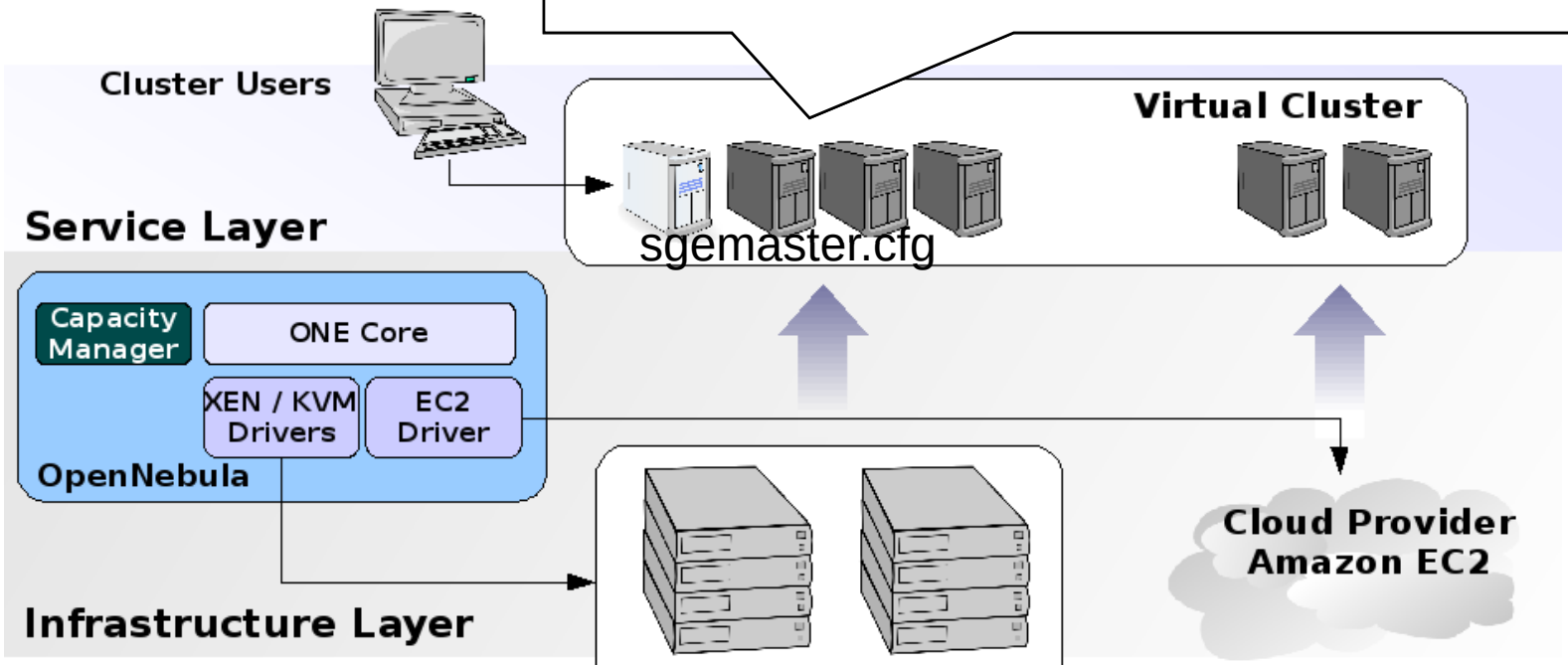



Cloud Access
• Supplement local resources with cloud resources to satisfy peak or fluctuating demands
SGE Frontend
Virtualized SGE nodes
OpenNebula
VMM
VMM
VMM
EC2
Dedicated SGE nodes
Cluster Nodes

# System Overview: The Service Layer



- Workernodes pre-registered to sgemaster
- IP & hostname assigned through DHCP (MAC)
- EC2 **worker-node images up-loaded to S3**
- EC2 nodes in an **openvpn network**




- Hosting SGE master with fixed IP
- Local worknodes

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THANK YOU FOR YOUR ATTENTION!!!
More info, downloads, mailing lists at
www.OpenNEbula.org

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www.reservoir-fp7.eu/

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