



Comparing IaaS

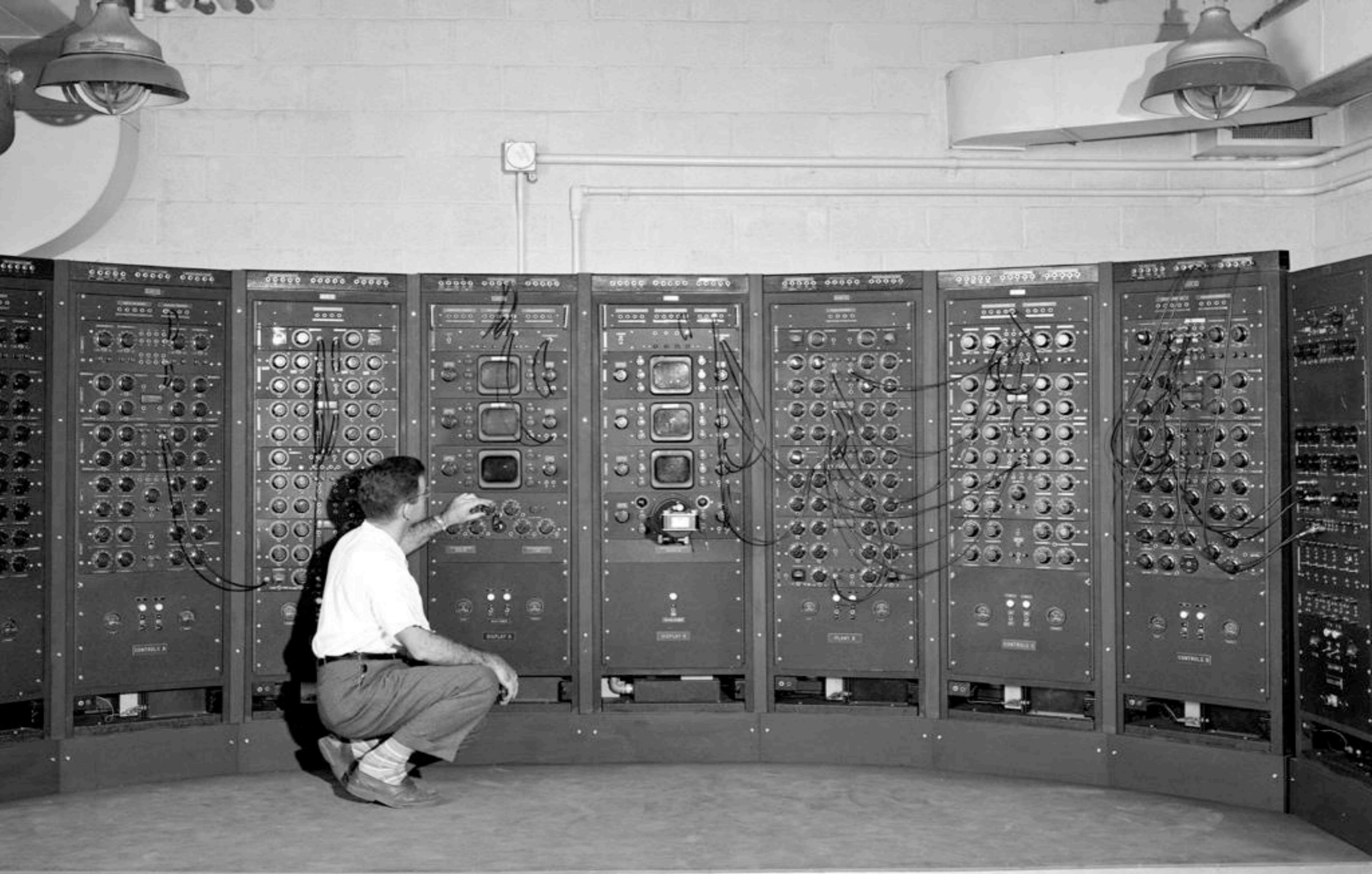
VMware vs OpenStack vs Google's Ganeti
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Knowing “Gippa”

- **EMEA Cloud Solution Architect for Canonical** (the company behind Ubuntu). In this role I work closely with the OpenStack community to deploy clouds mostly for big telcos in Europe and Middle-East. (www.canonical.com and www.ubuntu.com)
- **CTO of GARL**, the Swiss company behind the SecurePass cloud identity management service. While mostly focused on identity and security, I cooperate with the Google’s Ganeti project and team. (www.garl.ch and www.secure-pass.net)
- Previously Senior Solution Architect in Red Hat, Sun Microsystems and also in IBM.
- Works with Linux since 1996, I know most of the Open Source community. Within my (little) spare time, I publish books and whitepapers



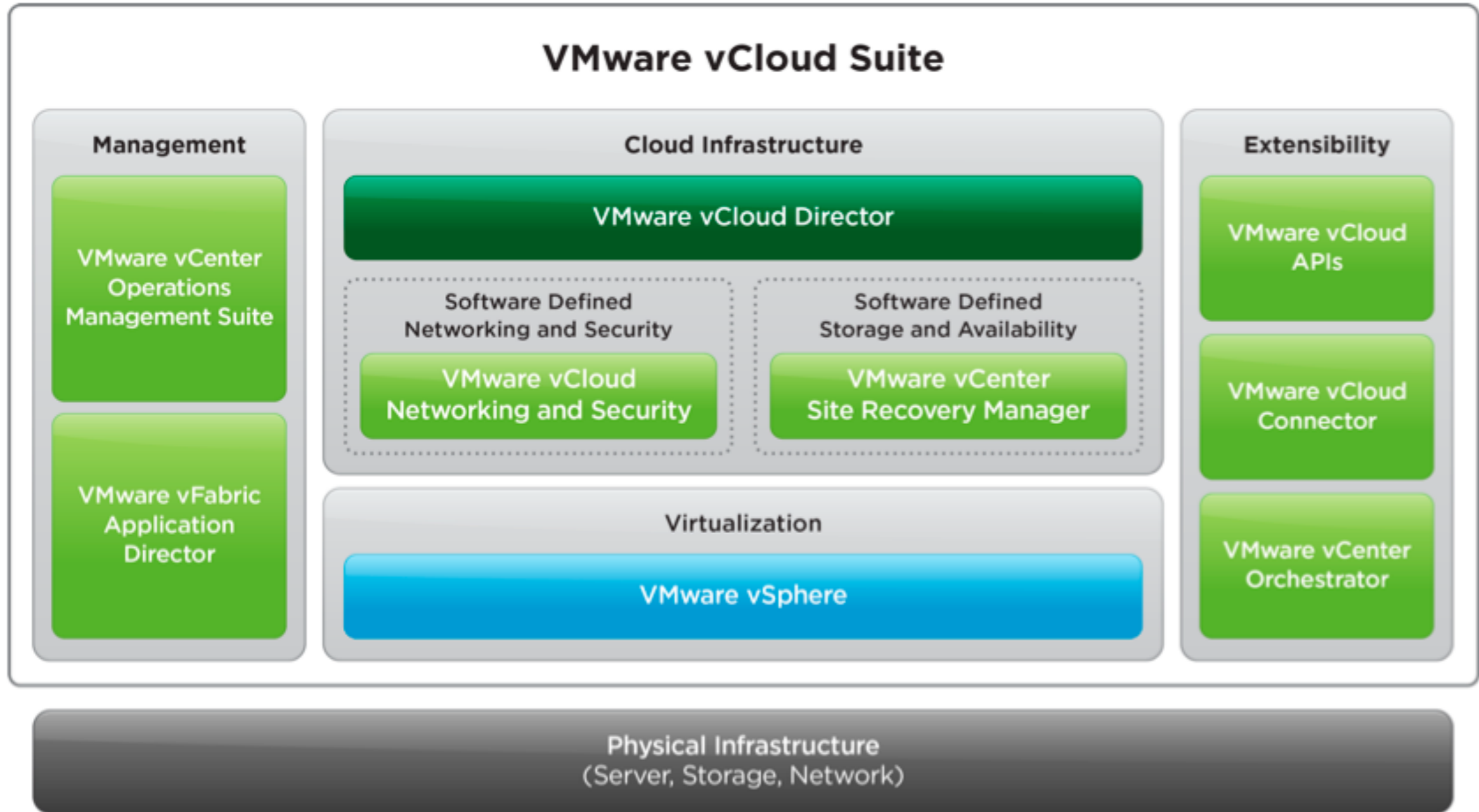


Private IaaS Today!

You don't know VMware?
Seriously?



VMware components

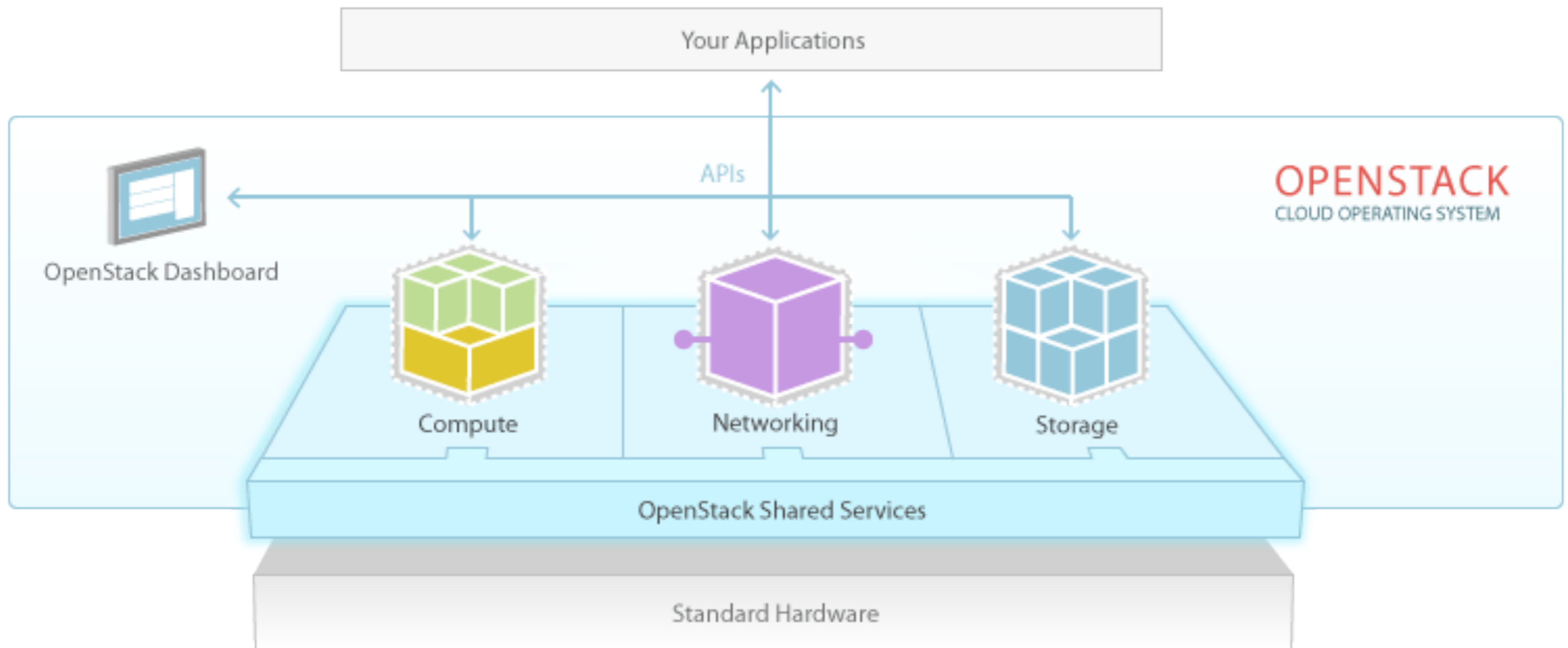




About OpenStack

- OpenSource under Apache license
- Born in 2010 from an idea of NASA and RackSpace
- Managed by the OpenStack Foundation, a non-profit corporate entity established in September 2012
- Aim to create Amazon-like services, with EC2 and S3 compatibility
- More than 200 members, among those: Canonical/Ubuntu, VMware, HP, IBM, RackSpace, Microsoft, AT&T, SuSE, RedHat

OpenStack components





OpenStack

an umbrella project for

Nova (Compute, where VMs are run)

Cinder (Block Storage, persistent storage for VMs)

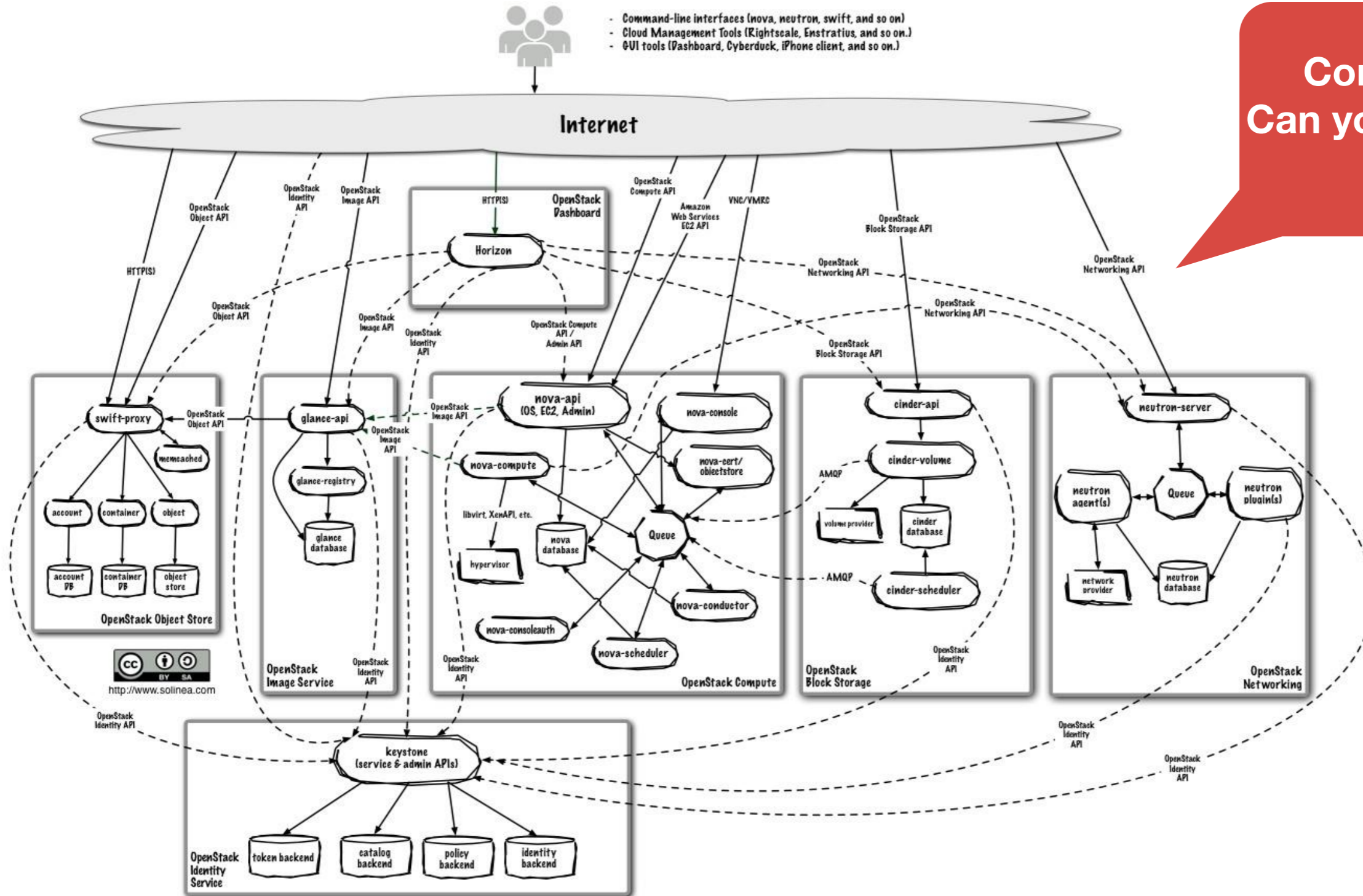
Swift (Object Storage snapshots and non-frequently updated data)

Keystone (Identity Management)

Neutron (Networking and SDN)

Glance (Image Service, where templates are)

OpenStack logical view



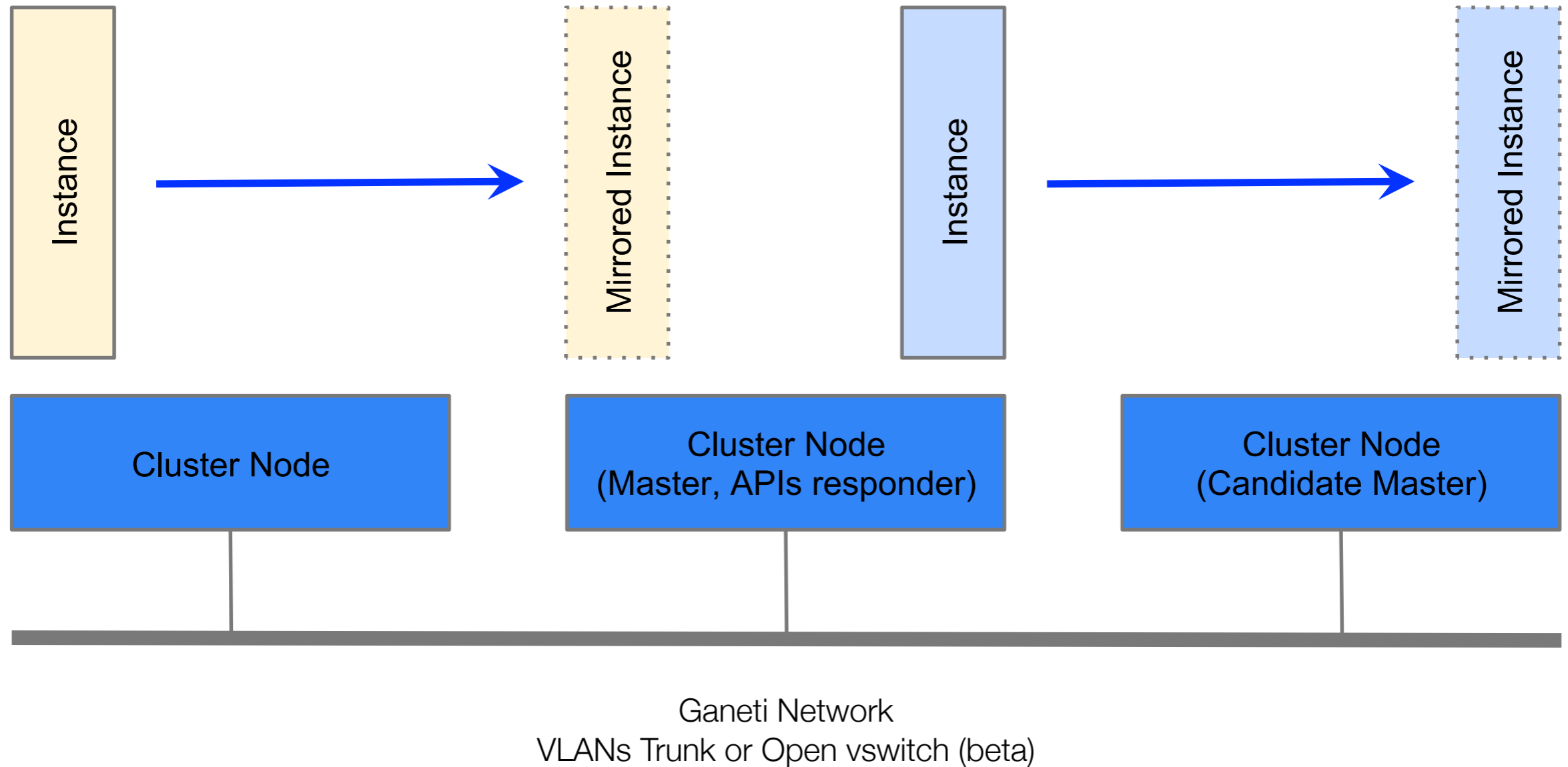
**Complex!
Can you handle
it?**



About Google's Ganeti

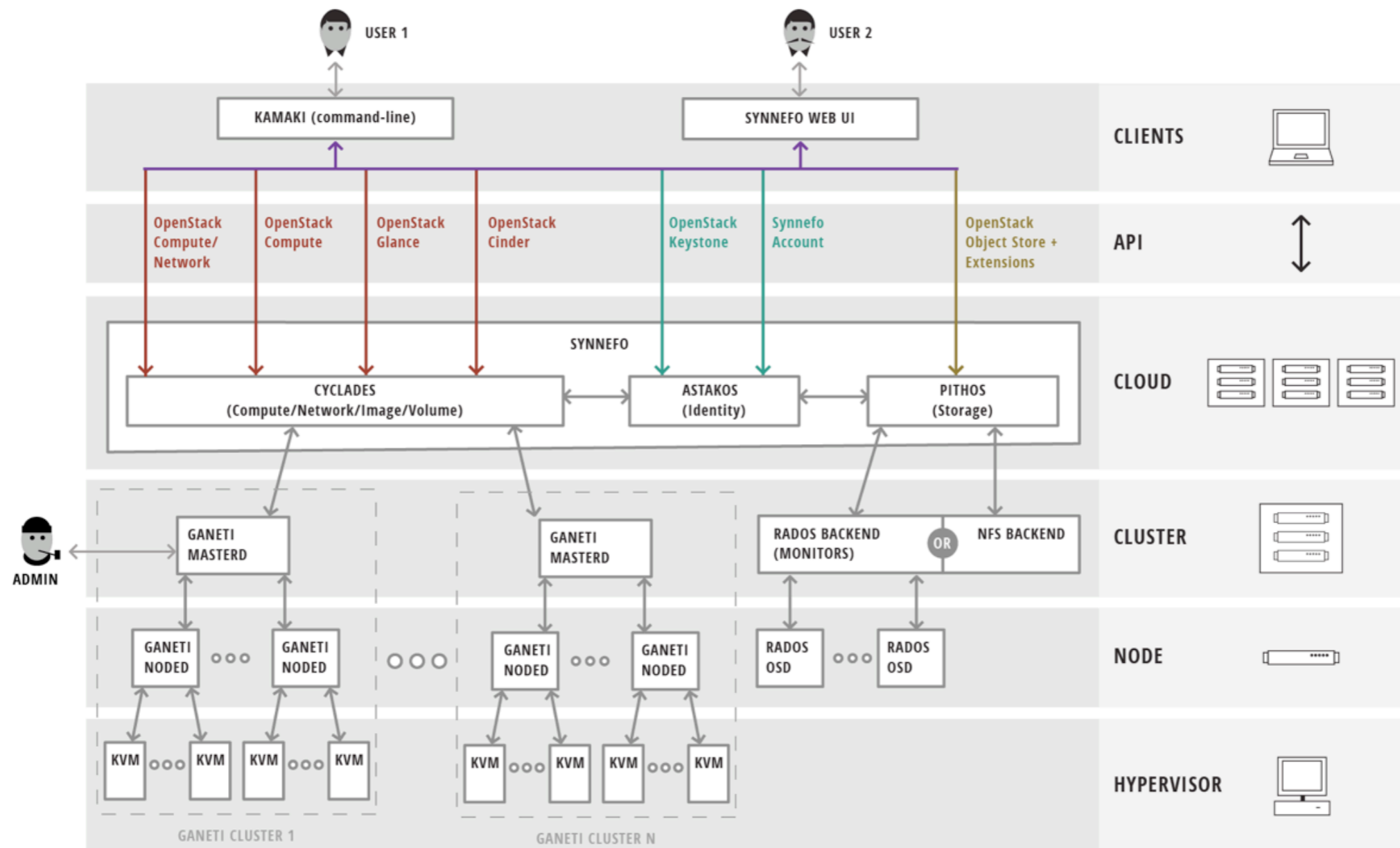
- Ganeti is a virtual machine cluster management tool
- Created by Google for Google (don't forget!)
- Used internally in Google [to serve the whole of Google's corporate infrastructure globally](#)
- Open Source since 2007
- Essentially a wrapper for existing well-proven rock-solid Linux technologies
- In-line with Google's philosophy of using commodity hardware
- Conceived to use cheap local storage

Ganeti components (enterprise deploy)



Using Ganeti as a “**standard**” virtual engine management

Ganeti components (full cloud deployment)



Using Ganeti at **maximum power** with Synnefo and OpenStack compatibility

Ganeti and Web UI

Ganeti per-se doesn't provide a GUI, just command line and APIs. Google has its own internal GUI that is not OSS, but there are two GUIs available:

Ganeti Web Manager

Simple HTML GUI for handling virtual machines

Easy to integrate into custom internal workflows and processes.

Synnefo

Full cloud infrastructure compatible with OpenStack made by the Greek Research and Technology Network (GRNET)

What really matters to IT Managers?



Has to be
easy to use

**Management
tools**, optional
web interface

Easy to find **skills
and support**

**Entry cost and
maintenance**, the
lower the better

Integration with
other platforms

VMware Pro/Cons

- Feature rich (vSphere HA, vMotion, DRS, I/O control)
- Very large ecosystems
- All os vendors make it supported and certified under ESXi
- ESXi can be downloaded and used freely
- Per core license - expensive
- Proprietary platform
- ESXi can not be APIs accessed - need to buy licenses



vmware®



OpenStack Pro/Cons

- Probably the most successful example of Open Source project after Linux
- Support from many OEMs and OS vendors
- Interoperability with many components, just pick your favorite one and plug it in
- Standard and well accepted APIs
- Very complex to setup and troubleshoot
- Although common codebase, might differ from implementations
- Need high numbers of management nodes
- High skills required to run the cluster



Ganeti Pro/Cons

- Lightweight architecture
- Can start with a single node and scale out easily
- Designed for use local storage and cheap storage (like Ceph)
- Great for "standard" Linux and Windows workloads
- Easy to pick up for a standard Linux sysadmin
- No official vendor support (check if KVM is supported)
- Needs slightly more skills than VMware (and less than openstack)
- HA of master need to be triggered from Monitoring platform
- Lack of some features (ex: storage vmotion)



Comparing technical features

	VMware	OpenStack	Ganeti
Hypervisor	ESXi	Many, including KVM, LXC, ESXi, Hyper-V	KVM, Xen (LXC next)
Customer and operations access	Windows client, vCloud Director (EOL'd)	OpenStack native dashboard, 3rd parties dashboards, CLI	Ganeti Web manager, Synnefo, CLI
Storage	VMFS over SAN and iSCSI	Default non-persistent images. Pluggable Cinder: block volumes, Ceph, several vendor SAN	Native: local disks, DRBD, Ceph. Pluggable external storage.
Network	Traditional switching infrastructure, SDN with additional products	Traditional switching and Software Defined Network	Traditional switching, pluggable extensions to Software Defined Network

Comparing technical features

	VMware	OpenStack	Ganeti
Image management	Catalogs & templates, OVF import	Glance Image Service, support all popular image formats	Imports all popular formats (same technologies of OpenStack)
Management System	vCenter	Nova (Cluster Controller)	Distributed management (similar to cluster)
High Availability	vCenter Heartbeat	Nova for VMs HA; OpenStack HA project for infrastructure components	Different philosophy, triggered by monitoring (ex: Nagios, GARL's clumond) 2.9 adds auto-repair
APIs	Proprietary, mostly only under perl and powershell	Open REST APIs, compatibility with Amazon EC2 & S3	Open REST APIs; OpenStack compatible APIs through Synnefo

Comparing non-technical features

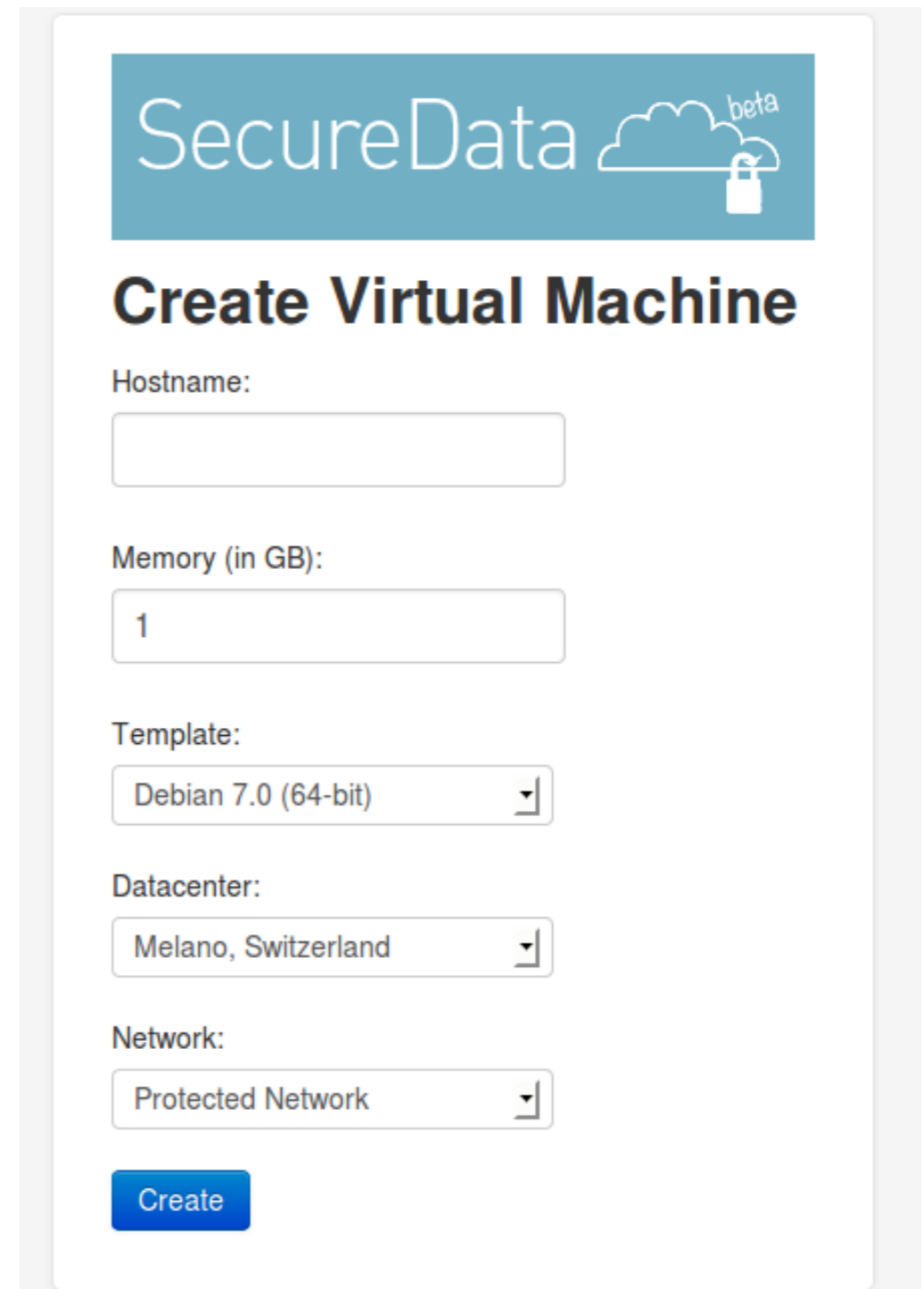
	VMware	OpenStack	Ganeti
Costs	License + maintenance fee	Open Source. Some might charge for a maintenance fee for enterprise support	Open Source
Industries	Virtualization for enterprises	Cloud management platform for large providers, carriers and large outsourcers	Virtualization for enterprises, small/medium cloud providers, private cloud and outsourcers
Skills	Basic system administration	High-end skills required, including system and network	Linux command line knowledge
Migration	VMware converter for P2V and other virtualization formats	Any to any through built-in qemu tools	Any to any through built-in qemu tools
Workloads	Traditional workloads, great for certified platforms (Oracle, SAP, ...)	Typical Web 2.0 workloads	Typical web 2.0 workloads, it works with traditional workloads (although might not be certified)

Comparing non-technical features

	VMware	OpenStack	Ganeti
Flexibility	Great guest OS support, large ecosystem	Primarily created for Linux, Windows supported on the same infrastructure	Primarily created for Linux, Windows supported on the same infrastructure
Expansion	Max 32 physical nodes, though not recommended	No actual limitation (might be handy create different Availability Zones)	Max 40 physical nodes, about 1200 virtual machines
Documentation and support	VMWare commercial telephone/web support	Active community, choice of vendor support	Support from vendors available for the OS and virtualization, not Ganeti itself
SW/HW Certifications	Yes	Yes	Yes (for the OS)

Ganeti, how easy can be

Can be as easy as
just filling a form and
a virtual machine can
be deployed in 120
seconds.



The image shows a web interface for creating a virtual machine. At the top, there is a blue header with the text 'SecureData' and a logo consisting of a cloud and a padlock, with the word 'beta' in the top right corner. Below the header, the title 'Create Virtual Machine' is displayed in bold. The form contains several fields: 'Hostname:' with an empty text input; 'Memory (in GB):' with a text input containing the number '1'; 'Template:' with a dropdown menu showing 'Debian 7.0 (64-bit)'; 'Datacenter:' with a dropdown menu showing 'Melano, Switzerland'; and 'Network:' with a dropdown menu showing 'Protected Network'. At the bottom of the form is a blue button labeled 'Create'.

Personal positioning of the technologies

Enterprises



ISPs/Carriers



Virtualization

Full cloud
(Amazon-like)



What platform is good for you?

If you need certified traditional workloads (ex: Oracle, SAP, Microsoft Dynamics, ...)

AND

you have money

AND

you want all the point-and-click features, this is a no-brainer decision:

go for VMware



vmware®

What platform is good for you?

If you are a large company or **ISP** with **hundreds of VMs and networks** being destroyed and created daily and have budget of having **more than 15 physical nodes** to start, go for OpenStack



What platform is good for you?

If you wish to **start small**, but wish to be able to **scale** and you are not caught in the certification craziness (the most important thing is that works with no problem), then choose Ganeti



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