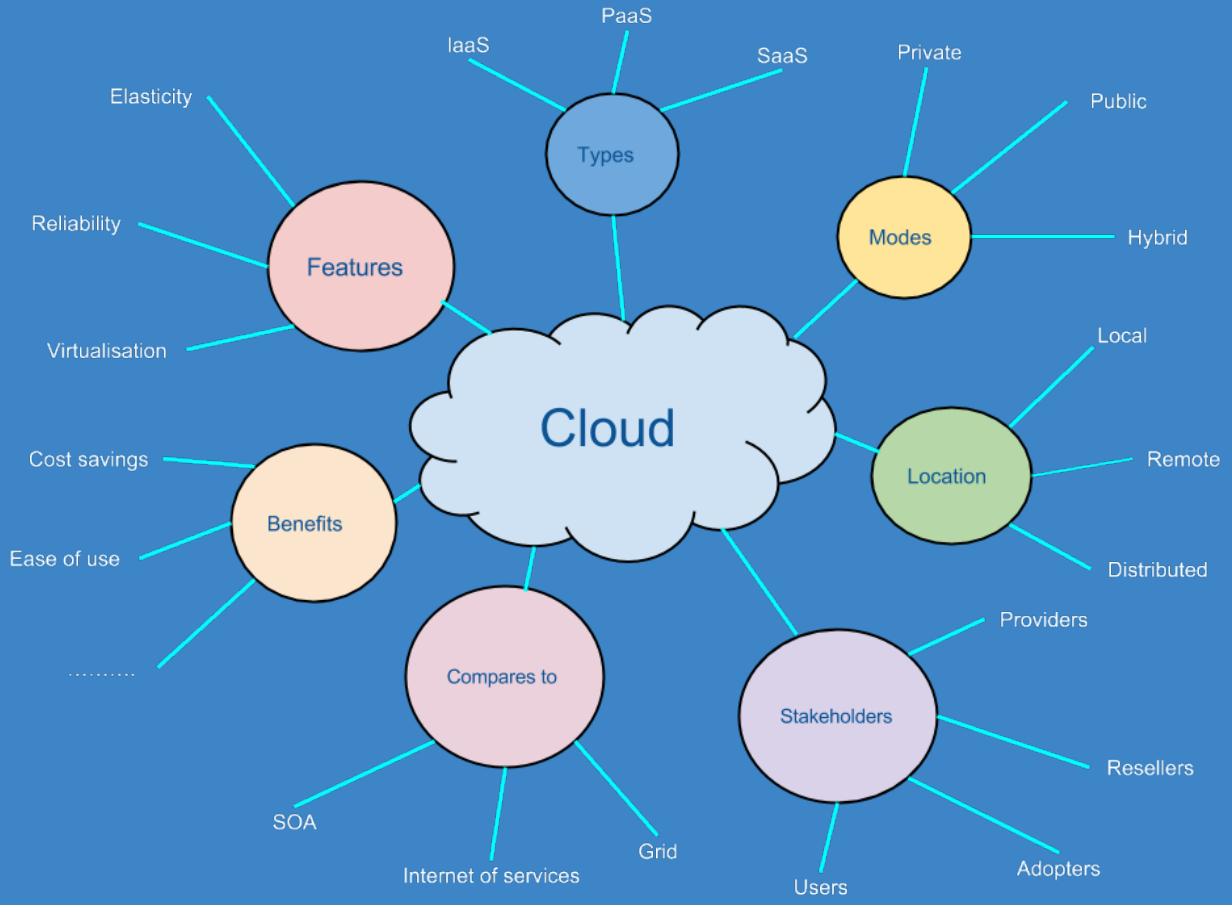
Code-to-Cloud with OpenNebula & Megam

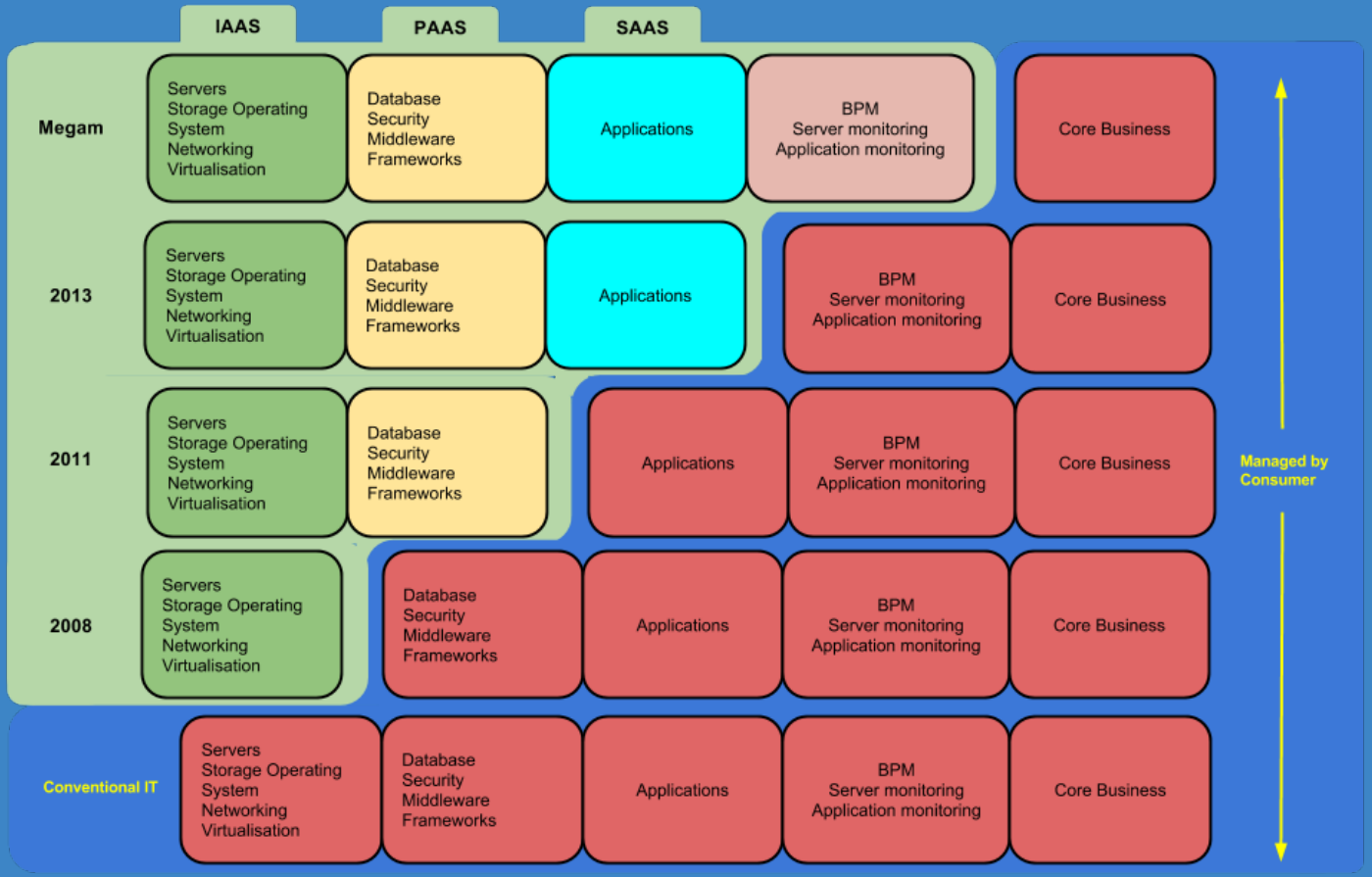
Varadarajan Narayanan
Kishore Kumar Neelamegam
Thomas Alrin
Raj Thilak

Megam Systems Ottawa , Canada

The Cloud system



Cloud Journey



Moving to cloud

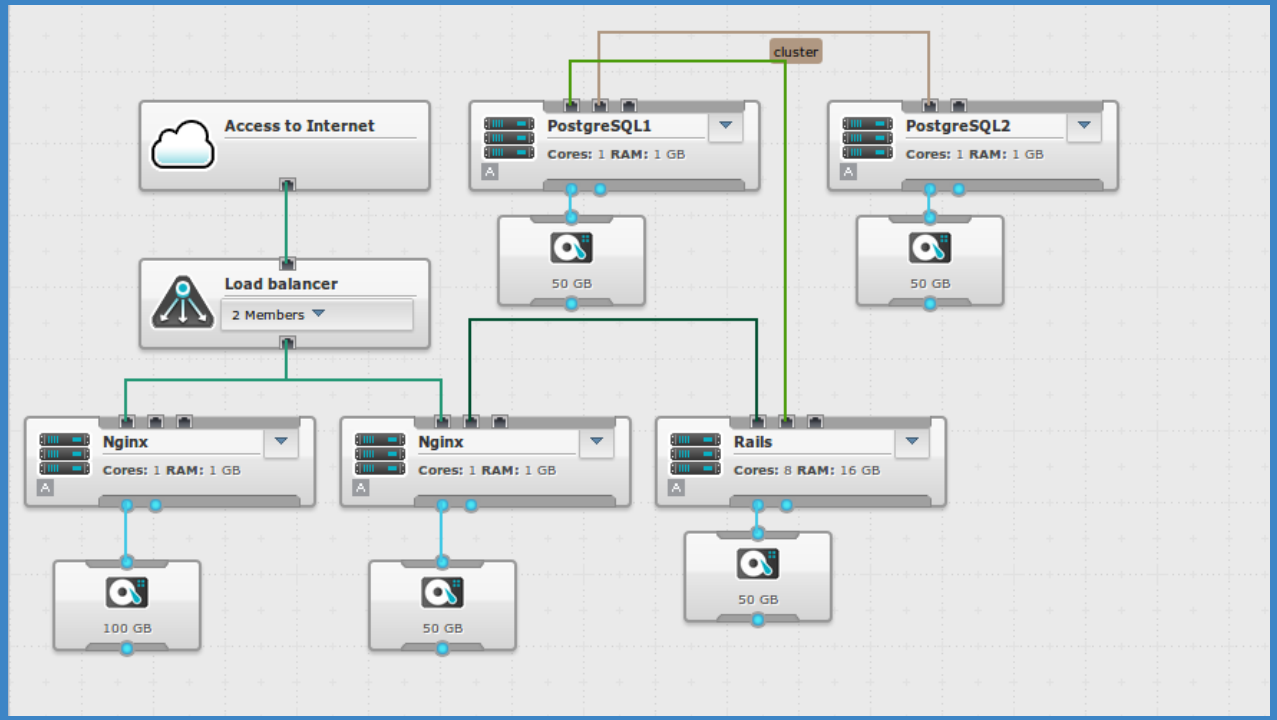
- Migration of development to production is a nightmare.
- Setting up an app environment takes ages.
- Most PAAS available today are coupled to single or few vendors
- No backup and DR solutions in place
- On demand auto scaling in a hybrid cloud environment is not feasible !
- Cloud add-ons for monitoring, logging, databases have fancy price tags !
- On site IT infrastructure, private cloud
- Multiple IAAS vendors !
- SAAS is siloed !

What if we can ….

- Deploy in any cloud - Private and public Clouds or hybrid
- Capture repetitions and use canned pre-built recipes
- Scale seamlessly
- Use multiple cloud storage solutions
- Use any framework - Java, Play, Ruby on Rails, Node.js, Akka … and any source cloud - Github , Bitbucket , Cloudforge ….
- Monitor, log and manage my apps
- API driven
- Integrate continuously with ALM & SDLC
- Avoid vendor lock in by sticking to open standards and open source

What does it mean for developers ?

Simplifies IaaS plumbing work so developers focus on developing applications.



Market

"The market will experience consistent growth with worldwide PaaS revenue totaling 1.5 billion in 2013, and growing to $2.9 billion in 2016 The SaaS-based cloud market will grow from $12.1B in 2013 to $21.3B in 2015, with the primary growth factors being ease of customization and speed of deployment"

- Gartner

Customers ?

- Enterprise With Apps/Cloud
- SaaS players
- SDLC (GitHub.com, Assembla, CloudForge, BitBucket ..)
- DevOps

Size ?

- 30 million Programmers World wide
- 16 million Code Repositories

What does it mean for IaaS providers ?

IaaS is the lowest in the value chain of cloud services and it generates least amount of revenue. As can be seen from the market trends IaaS market will be totally price-driven with little or no scope for differentiation. Agnosticism is a great value proposition for the IaaS users whereby you provide a bare - bones infrastructure to build anything on top of it. But IaaS providers have also begun to realize that the developer community finds value in a PaaS solution as it reduces their burden of handling various time consuming, mundane application development tasks. Therefore, many IaaS providers are moving up the value chain and adding PaaS solutions on top of their infrastructure offerings, in partnership with leading cloud platform providers.Thus offering PaaS will be a good strategy to retain customers , lower churn and marketing costs.

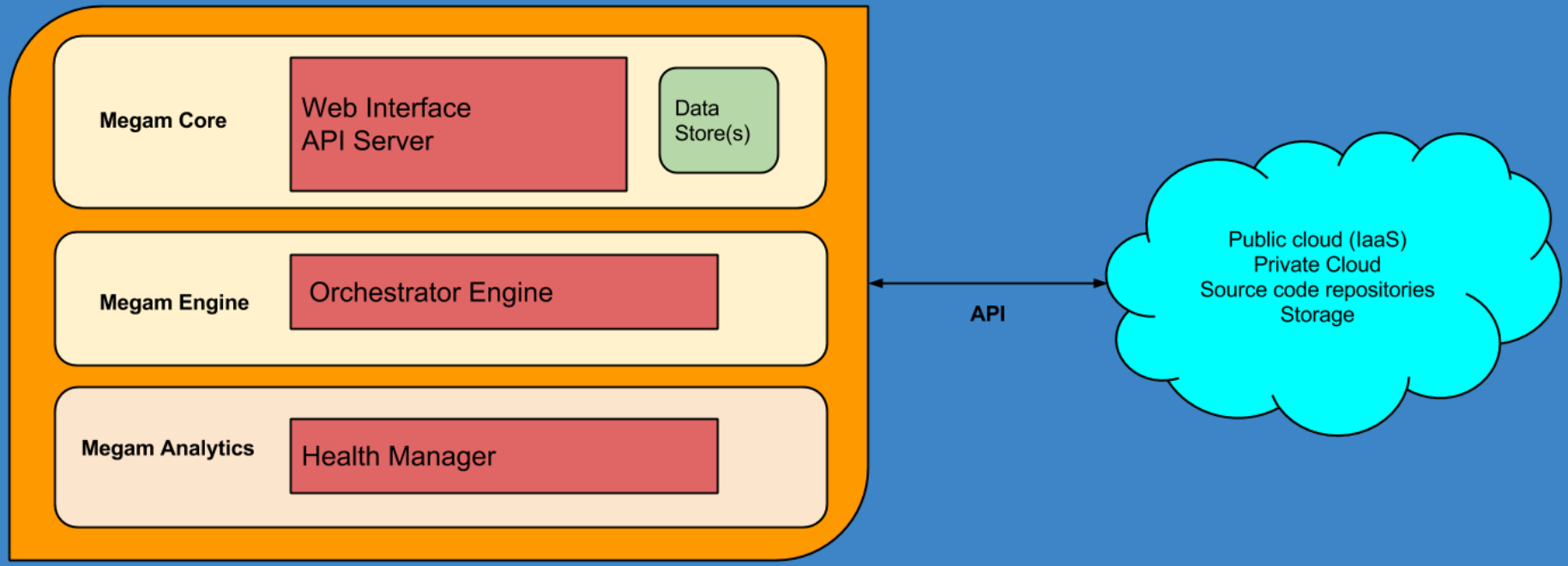
The largest segment of the IaaS opportunity -- 60%, according to some data -- is SMBs that lack the technical resources to manage their own cloud migration. Offering a PaaS solution which can be customised to their needs including hybrid cloud will be the secret sauce to switch this segment to cloud eco-system

The best provider strategy for IaaS may be to discount it in a bundle with higher-margin cloud services like PaaS for enterprises and to support developer relationships, then to look more to PaaS as the retail offering for the broader market. Cloud service providers who last this race will be those that offer services across different cloud layers, either through in-house offerings or partnerships.

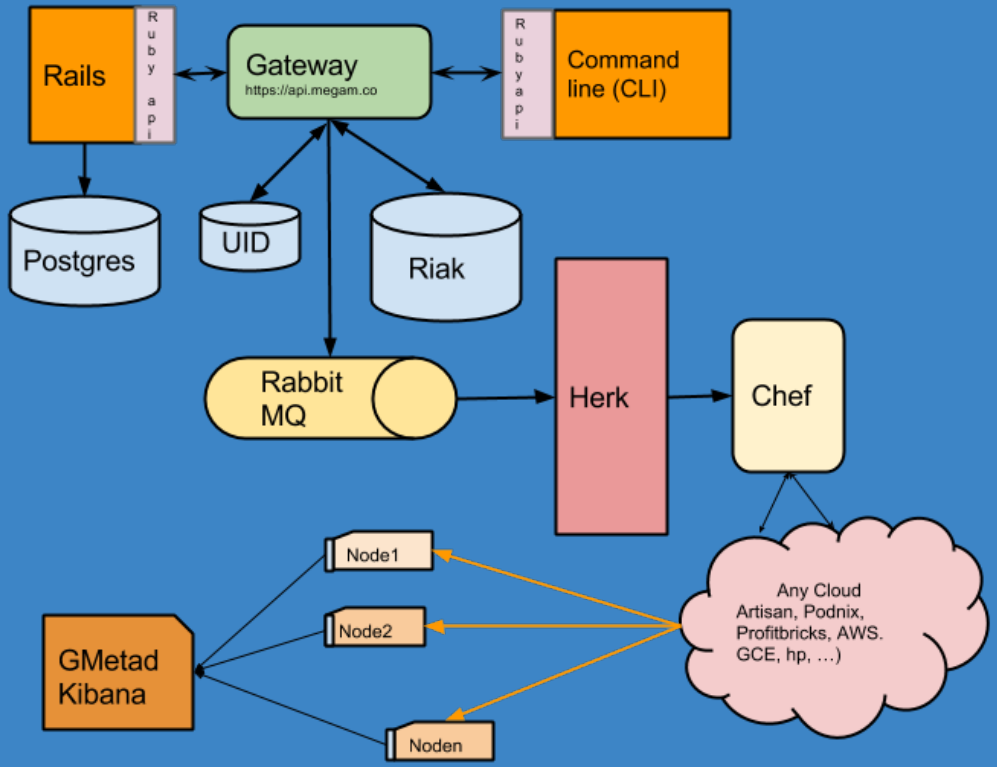
PaaS Requirements

- Self-Service Provisioning
- Service Catalog
- Chargeback
- Capacity Management
- Performance Management
- Configuration and Change Management
- Life Cycle Management
- External Cloud Connector
- Orchestration
- Platform
- Security
- Integration With Third-Party Tools
- Licensing
- Product Support

Overview of Megam



Logical architecture of Megam



Open source software employed

Name	Software
Ubuntu	14.04
Ruby	2.1.x (http://ruby-lang.org)
PostgreSQL	9.3 (http://postgresql.org)
Golang	1.3.x (http://golang.org)
Scala	2.10.x (http://scala-lang.org)
Playframework	2.3.x (http://playframework.com)
Akka	2.3.x (http://akka.io)
Riak	2.0 beta1 (http://basho.com)
Chef	11.x (http://opscode.com)
RabbitMQ	3.3.x (http://www.rabbitmq.com)
GMetad	3.6.x (http://ganglia.sourceforge.net)
Elastic server, Logstash, Kibana	1.4.x http://logstash.net, 1.2.x http://www.elasticserver.org, kibana.org (3.0)

Standards - OASIS

OASIS (Organization for the Advancement of Structured Information Standards) is a non-profit consortium that drives the development, convergence and adoption of open standards for the global information society.

OASIS promotes industry consensus and produces worldwide standards for security, Cloud computing, SOA, Web services, the Smart Grid, electronic publishing, emergency management, and other areas. OASIS open standards offer the potential to lower cost, stimulate innovation, grow global markets, and protect the right of free choice of technology.

OASIS members broadly represent the marketplace of public and private sector technology leaders, users and influencers. The consortium has more than 5,000 participants representing over 600 organizations and individual members in more than 65 countries.

Topology and Orchestration Specification for Cloud Applications (TOSCA)

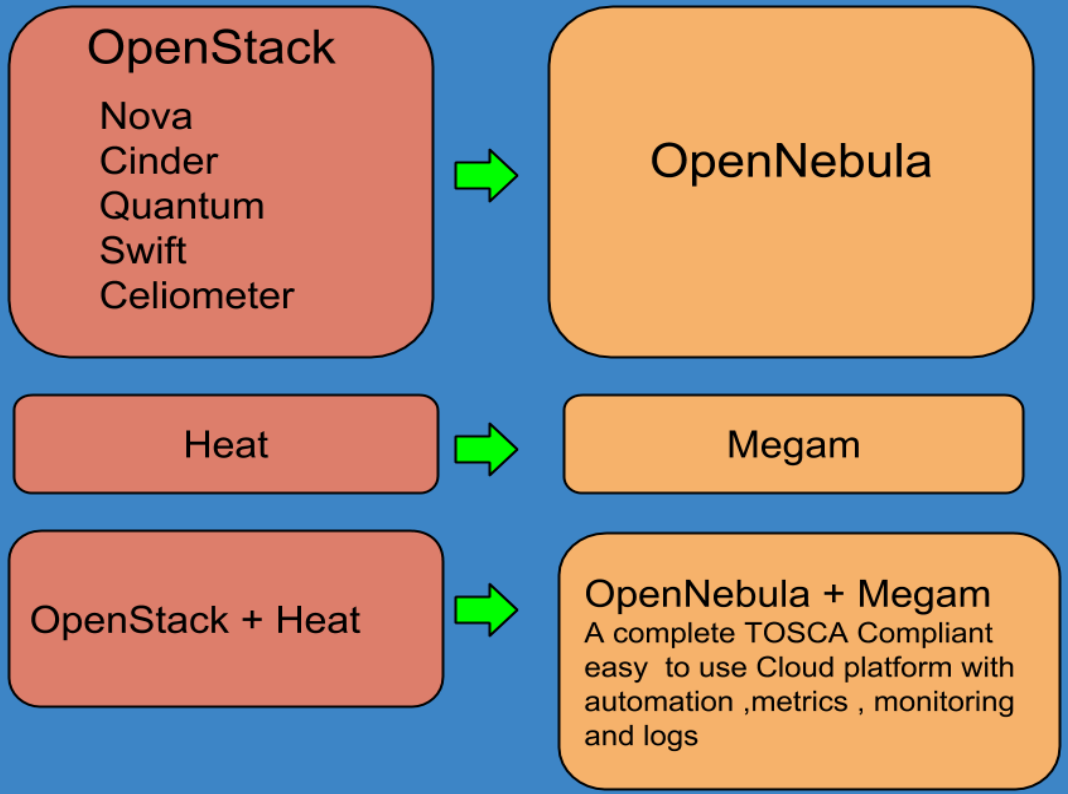
The OASIS TOSCA TC works to enhance the portability of cloud applications and services. TOSCA will enable the interoperable description of application and infrastructure cloud services, the relationships between parts of the service, and the operational behavior of these services (e.g., deploy, patch, shutdown)--independent of the supplier creating the service, and any particular cloud provider or hosting technology. TOSCA will also make it possible for higher-level operational behavior to be associated with cloud infrastructure management.

By increasing service and application portability in a vendor-neutral ecosystem, TOSCA will enable:

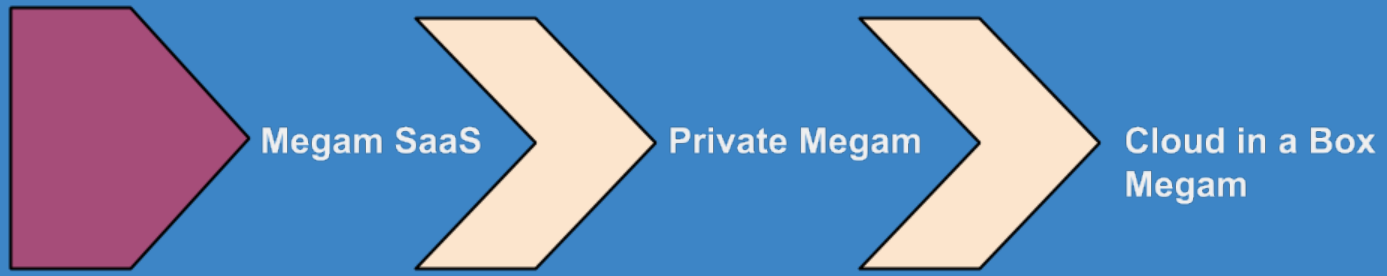
- Portable deployment to any compliant cloud
- Smoother migration of existing applications to the cloud
- Flexible bursting (consumer choice)
- Dynamic, multi-cloud provider applications

Megam will comply with TOSCA standards and hence will interface seamlessly with all clouds like OpenStack (Heat) , HP , IBM , Google , Redhat and Cisco.

OpenStack vs (Megam + OpenNebula)



Roadmap



Public Megam https://www.megam.co	Private Megam In-premise { data centers}	Cloud in a Box Hardware Appliance

Megam SaaS

Web: https://www.megam.co

Clouds supported: Gogrid, Profitbricks, OpenNebula, Google CE, Podnix, EC2, HP

Apps: Rails, Java, Play(Scala), Akka(Scala), Nodejs

Services: PostgreSQL, Riak, Redis

Marketplace with addons : HA, Backup, Zarafa, Op5)

OpenNebula Chef Plugin

This is a ruby Gem

Install :gem install knife-opennebula

Run :knife-opennebula to execute it.

- Create a VM using a template stored in OpenNebula
- Delete a VM
- Manage templates

Source repository: https://github.com/opennebula/addon-knife.git

Megam SaaS with OpenNebula

1. Megam SaaS has “OpenNebula chef plugin” installed which helps the “Megam Engine” to orchestrate a template.
2. Create a template in OpenNebula
3. Log in to Megam SaaS and create a cloud setting for OpenNebula.
4. Launch an App / Service using the setting in Megam.
5. OpenNebula notifies Megam about the readiness of the VM using OneGate.
6. Upon notification from OpenNebula ,Megam complete the installation of App/Service.

Megam Packages

sudo add-apt-repository ppa:megam/cloudorchestrator

Megam Core

sudo apt-get install megam_gateway

sudo apt-get install megam_nilavu

Megam Engine

sudo apt-get install megam_engine

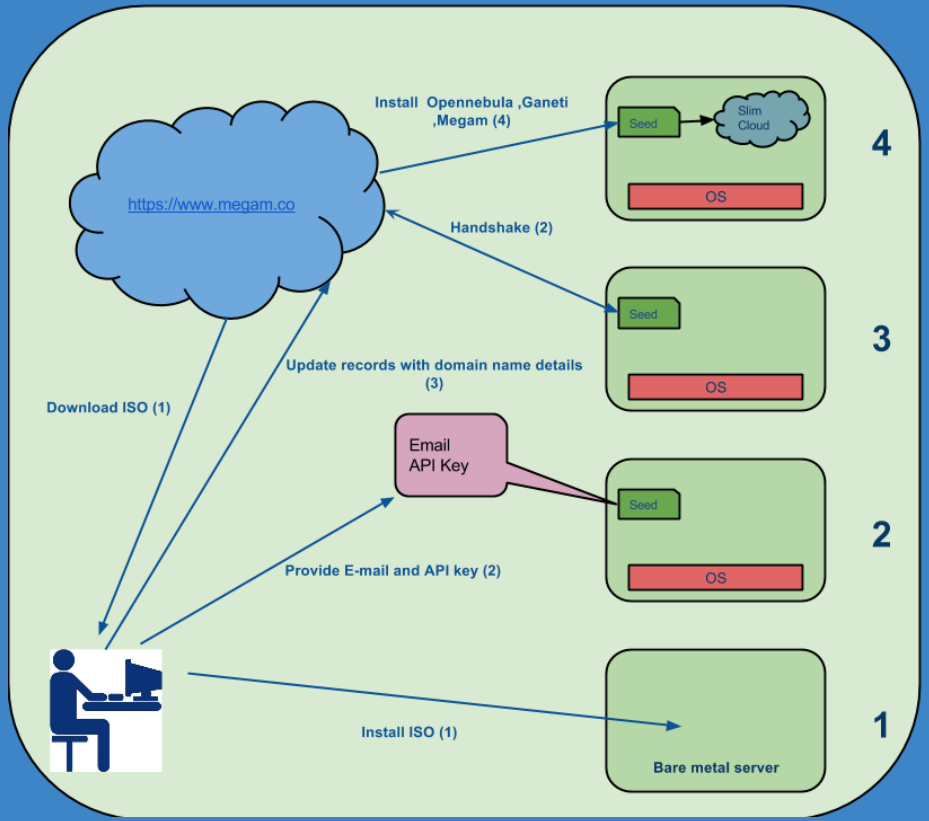
Megam Analytics

sudo apt-get install megam_tap

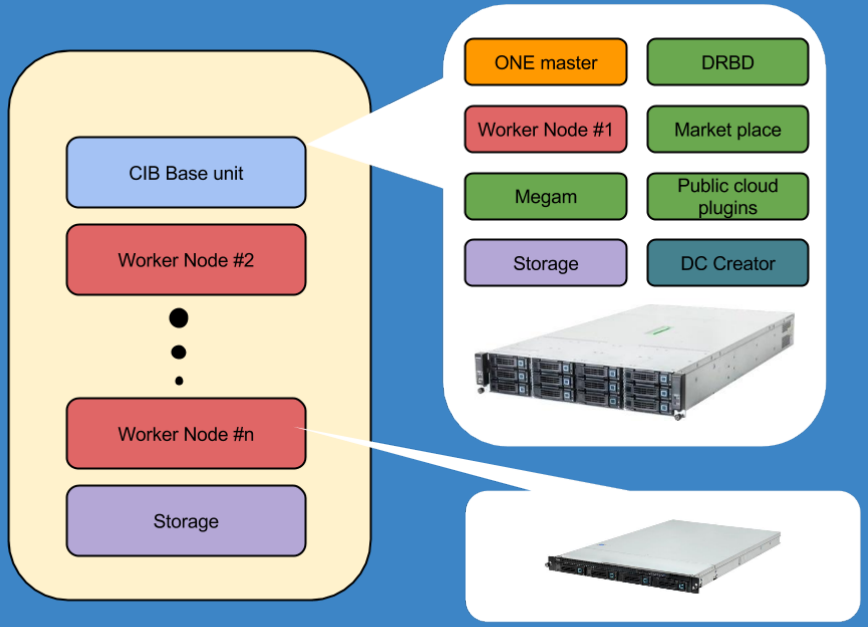
Megam - Private Cloud

- By running a minimal Install-Megam ISO, one can install OpenNebula + Megam in a bare metal server thus creating a self contained private cloud
- A physical server connected to LAN with DHCP server and internet access is required.User will have the option of selecting OpenNebula Or Ganeti as IaaS platform with Megam as PaaS.User can also install Megam as a stand alone server.
- Register at Megam SaaS and Download the ISO and install it and start the seed using the registered Email / api_key.
- Confirm the handshake of the physical server at Megam SaaS and start the slim cloud (Opennebula / Ganeti / Megam) installation.

Megam - Private Cloud



Megam - Cloud in a Box



Fully configured private cloud with PaaS , storage , backup , marketplace and cloud bursting to public clouds

In the works….

Docker support for OpenNebula

Densely packed VMs

Visual Cloud designer

TOSCA compliance

Advanced APM for VMs

Thank you !