

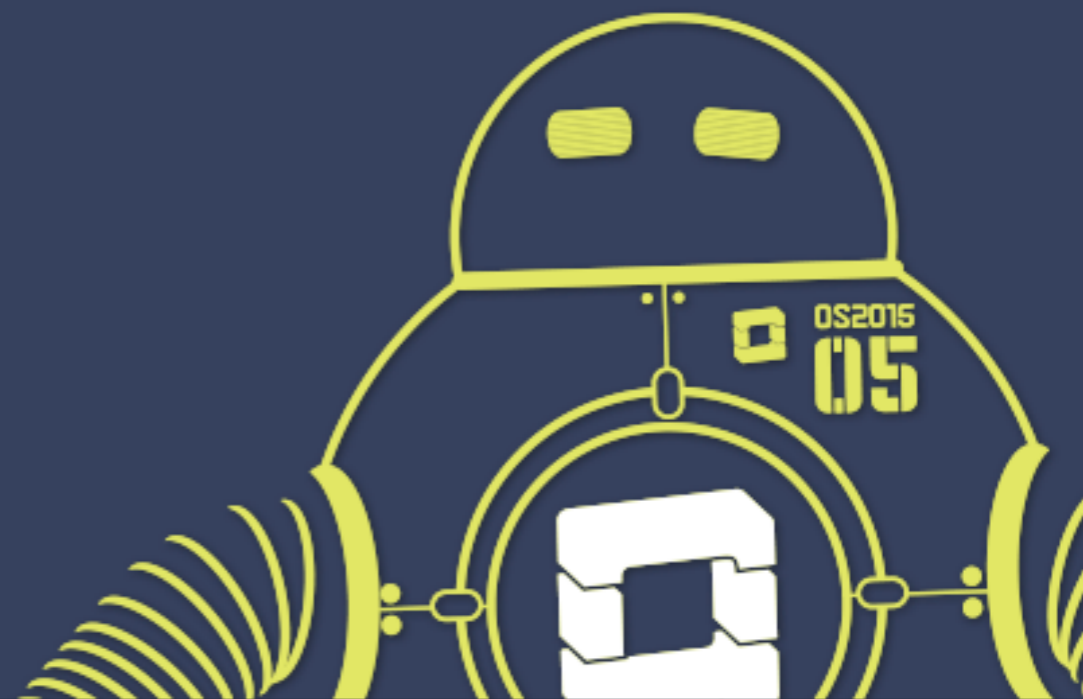


# INTRO TO OPEN STACK

German Eichberger



openstack



**27550**

openstack members



**167**

countries with registered  
community members



**523**

organizations involved

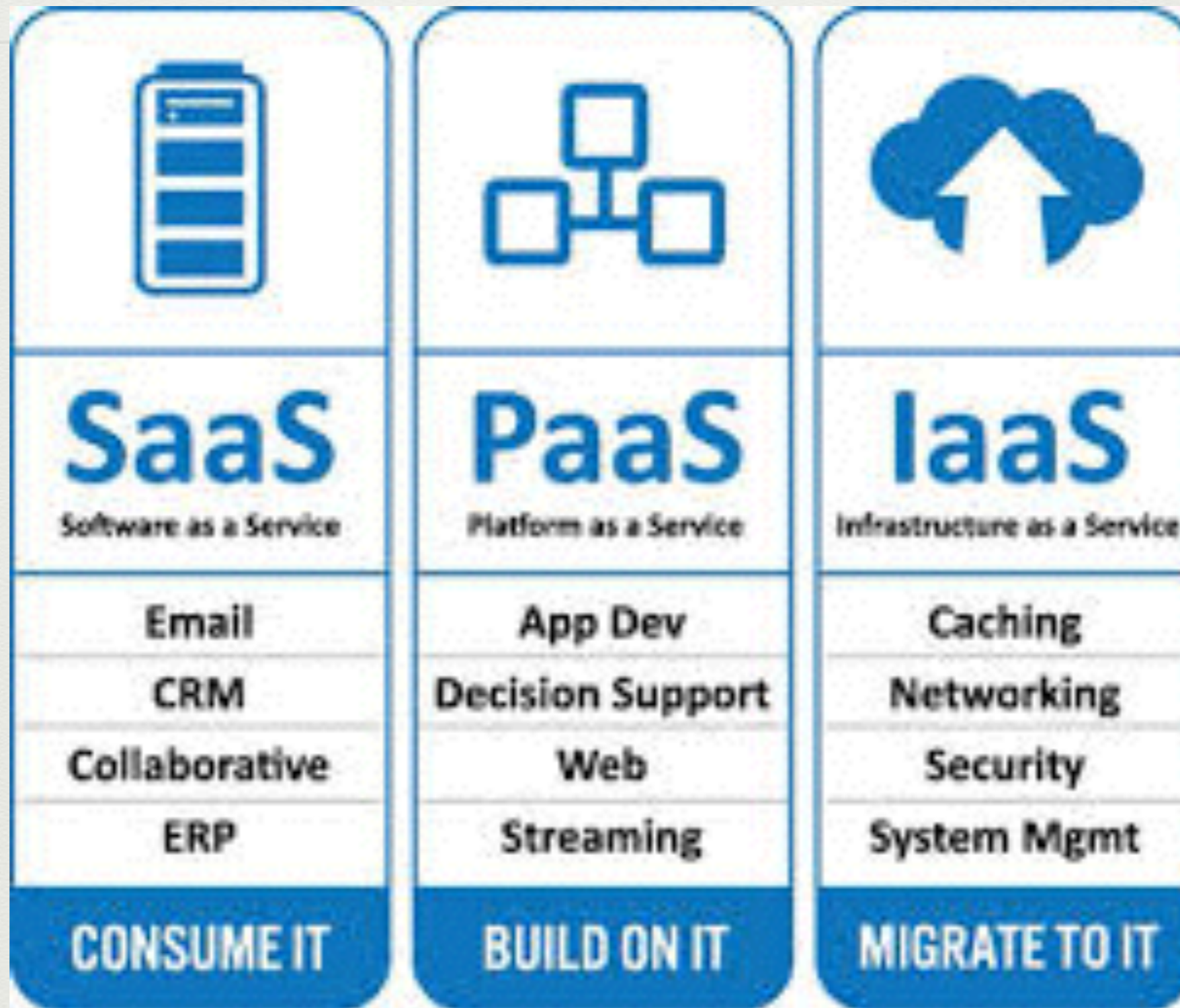
# Agenda

- What is cloud?
- What is OpenStack
- Selected Components
- Demo
- Docker and Cloud Foundry



OpenStack Conference Paris, Kilo

# What is Cloud

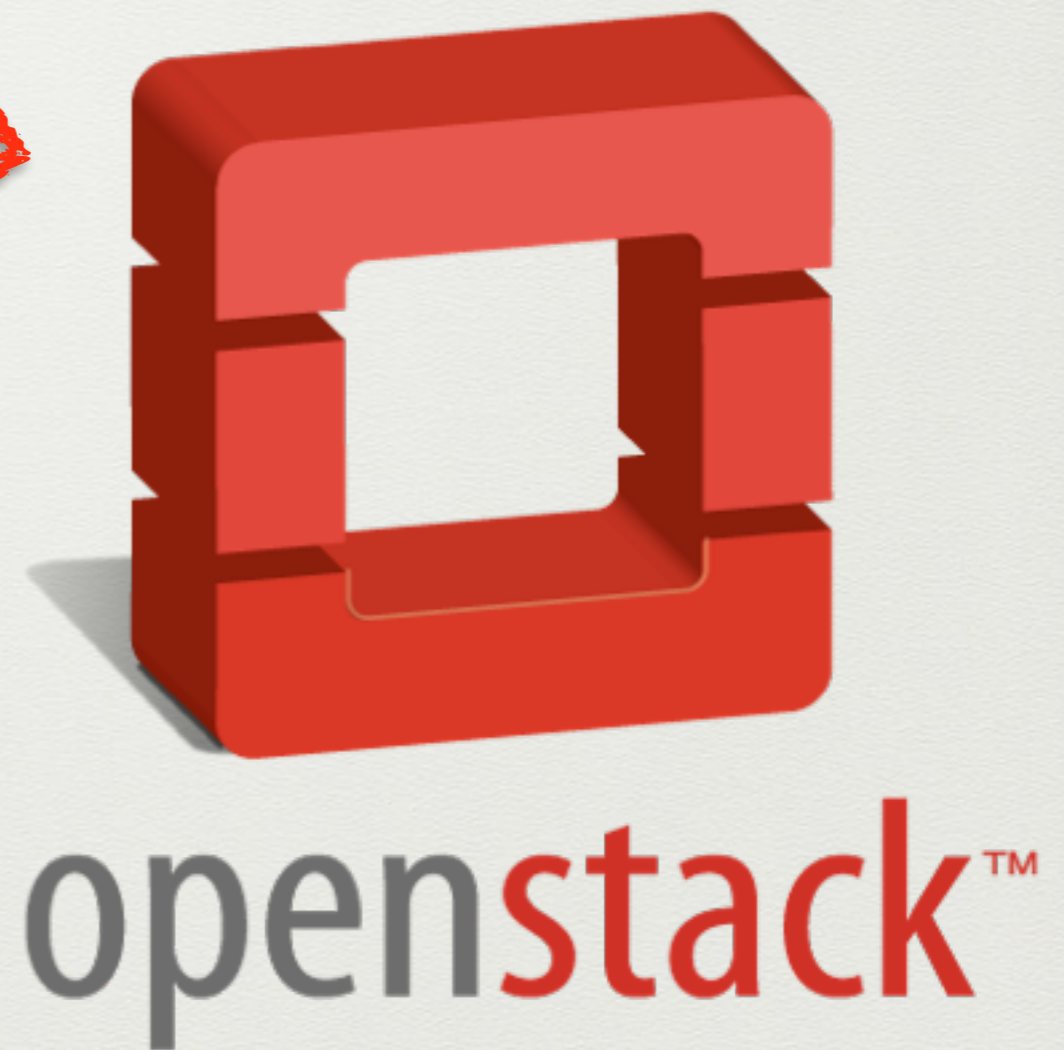


# What Open Stack is not

- It's not a single Open Source project
- It's not a hypervisor
- It's not a storage platform
- It's not (necessarily) competitive with VMware

# What is Open Stack?

OpenStack is a free and open-source software cloud computing software platform.[2] Users primarily deploy it as an infrastructure as a service (IaaS) solution. The technology consists of a series of interrelated projects that control pools of processing, storage, and networking resources throughout a data center—which users manage through a web-based dashboard, command-line tools, or a RESTful API. OpenStack.org releases it under the terms of the Apache License.



<http://en.wikipedia.org/wiki/OpenStack>

# OPEN STACK COMPONENTS

## **Current OpenStack programs are listed below:**

- OpenStack Compute (code-name Nova) - integrated project since Austin release
- OpenStack Networking (code-name Neutron) - integrated project since Folsom release
- OpenStack Object Storage (code-name Swift) - integrated project since Austin release
- OpenStack Block Storage (code-name Cinder) - integrated project since Folsom release
- OpenStack Identity (code-name Keystone) - integrated project since Essex release
- OpenStack Image Service (code-name Glance) - integrated project since Bexar release
- OpenStack Dashboard (code-name Horizon) - integrated project since Essex release
- OpenStack Telemetry (code-name Ceilometer) - integrated project since the Havana release
- OpenStack Orchestration (code-name Heat) - integrated project since the Havana release
- OpenStack Database (code-name Trove) - integrated project since the Icehouse release
- OpenStack Data Processing (code-name Sahara) - integrated project since the Juno release
- OpenStack Bare-Metal Provisioning (code-name Ironic) - integrated project since the Kilo release

## **New capabilities under development for Liberty and beyond:**

- Queue Service (Zaqar)
- Shared file system (Manila)
- DNS Service (Designate)
- Key Management (Barbican)

# Compute - Nova

- Conceptually similar to Amazon EC2
- Can leverage multiple Hypervisors (Xen, KVM, vSphere, Hyper-V)
- Made up of several sub components (nova-api, nova-compute, nova-scheduler)





# Object Store - Swift

- Similar to Amazon S3
- Provides distributed object storage
- Supports the OpenStack API as well as raw HTTP



# Image Catalog - Glance

- Similar to Amazon's AMI catalog
- Provides image storage, image retrieval, and image discovery services
- These images are leveraged to launch instances (VM)



# Identity - Keystone

- Provides policy and authentication services for other OpenStack services
- Leverages a pluggable architecture that can support LDAP, SQL, and other backend services



# Block Storage - Cinder

- Similar to Amazon EBS
- Provides block storage functionality to instances running on Compute
  - Recall that instances are stateless
  - Block storage provides persistent storage for instances
- Similar to compute several sub-components (cinder-api, cinder-volume, cinder-schedule)
- Leverages storage drivers to interact with underlying storage platform

# Network - Neutron

- Provides “network-as-a-service” functionality
- Allows for programmatic creation of (potentially) complex per-tenant networks
- Uses a plug-in architecture; plugins exist for a different of backend implementations, Open vSwitch (OVS), OVN, Linux Bridge, Open Daylight, Cisco and others
- Plugins also exist for middle-functions like FWaaS, LBaaS, and VPNaaS

# Dashboard - Horizon

- A web application that runs on Apache
- Provides a graphical user interface (GUI) for other OpenStack services
- Leverages the API of the other OpenStack services



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## New capabilities under development for Liberty and beyond:

- **Queue Service (Zaqar)**
- **Shared file system (Manila)**
- **DNS Service (Designate)**
- **Key Management (Barbican)**

# The business case for OpenStack

- For most companies it makes more sense to sign up for a public cloud than to run their own
- there are still more businesses treating servers like pets than cattle
- there are legions of IT staffers that will be protecting what they believe is their livelihood – the private infrastructure – at all costs
- Unless technical leadership is willing to wage total war on its own infrastructure, then, private infrastructure will continue to be a thing.



# Open Stack

- On premise
- Hybrid Cloud
- Public Cloud
- All OpenSource...  
and we are back to  
the distro days :-)



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# Demo Time

- Compute
- Network
- Storage
- [http://172.16.90.130/  
auth/login/?next=/](http://172.16.90.130/auth/login/?next=/)
- demo/password or  
admin/password

TECH OPENSTACK See the Fortune 500 list

# All aboard! Google climbs on the OpenStack train

by Barb Darrow @gigabarb JULY 16, 2015, 11:00 AM EDT



Collaboration promises that companies will be able to use OpenStack to manage virtual, non-virtual, and container apps from one dashboard.

Photograph by Simon Dawson — Bloomberg via Getty Images

Magnum - <http://adrianotto.com/2015/05/video-vancouver-openstack-keynote-with-magnum-and-kubernetes/>

# Docker!Docker!Docker?

“The first is a move towards the hybrid cloud. Few enterprises can move their entire infrastructure to the public cloud. For most, hybrid deployments will be the norm and OpenStack is emerging as a standard for the on-premises component of these deployments.

The second trend is a move towards container-oriented computing. Google pioneered new patterns around containers, dynamic scheduling, and micro-service architectures. We did this to solve hard problems building and operating applications at internet scale, but the model translates well to everyday applications and solves long standing problems in operations. Recently, through the Kubernetes project, we have started bringing these patterns to the open source community.”

# Cloud Foundry?

- OpenStack is trying to move (unconvincingly) into the PaaS realm
- Cloud Foundry is an open source cloud computing platform as a service (PaaS) originally developed by VMware and now owned by Pivotal Software
- Many vendors offer Cloud Foundry on top of OpenStack as their PaaS of choice



DEVOPS

WHAT IS DEVOPS?

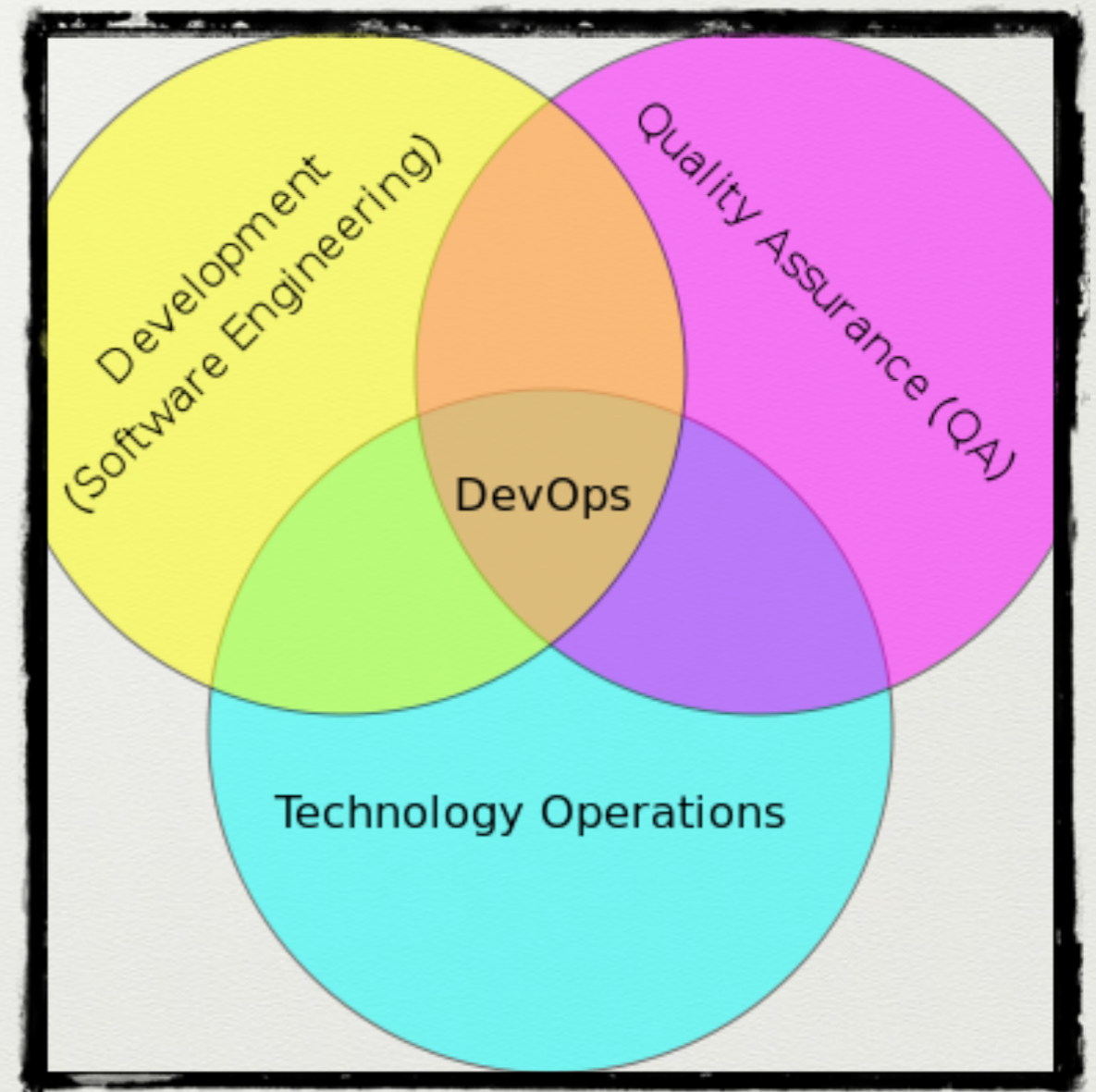


“DEVELOPERS CARRYING A  
PAGER”



# More formal

- DevOps is a software development method that emphasizes communication, collaboration, integration, automation, and measurement of cooperation between software developers and other IT professionals. [...] help an organization rapidly produce software products and services and to improve operations performance

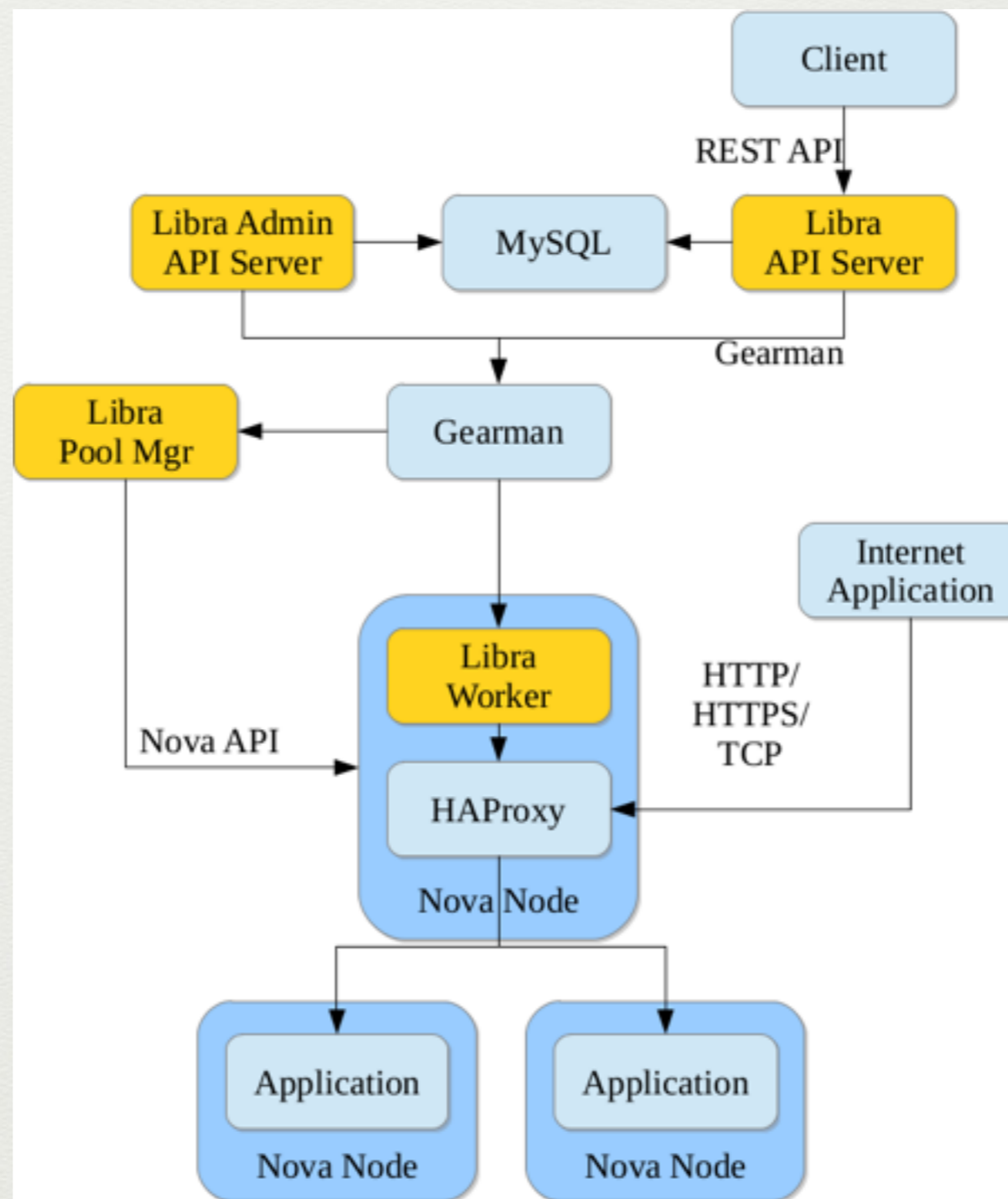


# Huge Paradigm Shift

- It's how Facebook, Google, etc. operate
- It's very similar to the agile transformation — so management can't say let's do devops tomorrow
- Combines scripts to build an environment (stack) with CI, automated test, and feedback from production
- <https://github.com/capitalone/Hygieia>

# What is libra?

- Libra is an Open Source software Loadbalancing solution HP used to employ in public cloud - <https://github.com/stackforge/libra>
- Has been replaced with a proprietary solution retaining the same API in public cloud and a community project (Octavia) with a completely new API



# Use case: Libra team

- 1 team lead
- 4 devs
- 2 ops
- this is arbitrary -

# Use case: Libra team

- Deployments are completely automated (in this case with salt)
- In fact, when a dev adds a feature he also writes the deployment script, and eventually the automation test
- Usually several deployment environments (qa, stage, etc)
  - Libra: stage, west, east

# Happy case

- normal deploy

# Problems

- Pager, goes off, we stabilize...
- 5 Why's
- Often we need more monitoring & alerting...
  - so we write code to expose that metric if necessary
  - add to our salt scripts to send that value to data dog



# Early tooling

QUESTIONS?



Thank You!