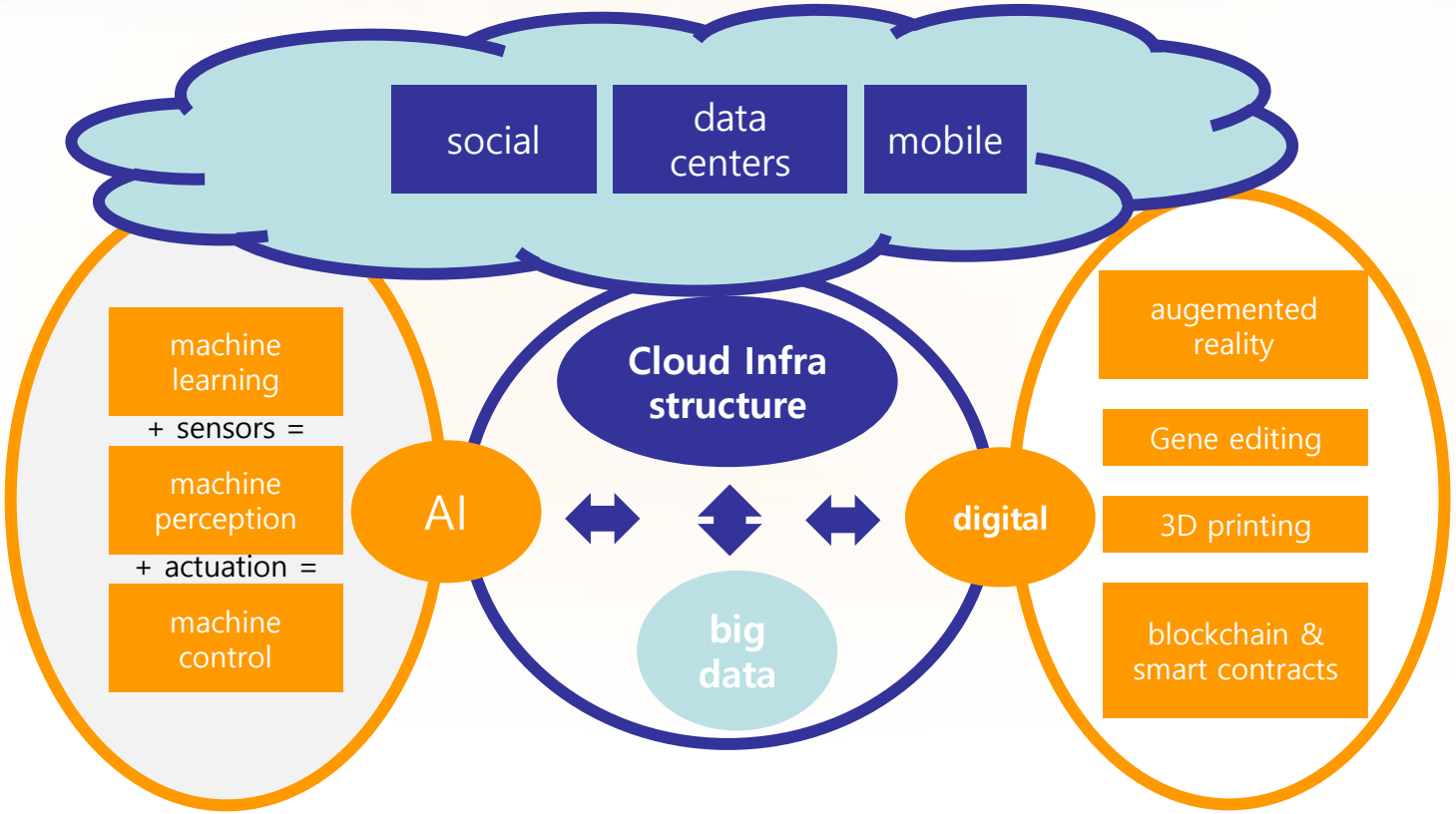
Understanding the Cloud Platform Deployment

School of Software / Soongsil University

Prof. YOUNGJONG KIM, Ph.D.

Cloud?

Cloud Infrastructure is the **basis of everything**

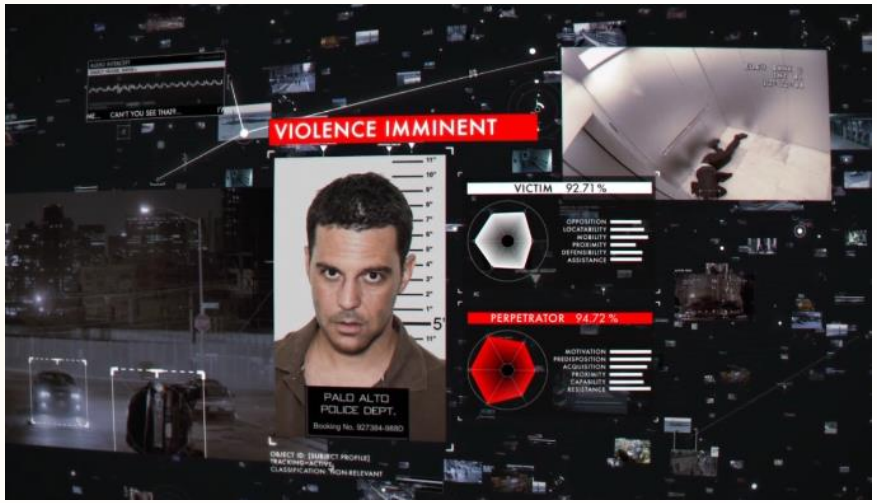


http://www.kempitlaw.com/trends-in-information-technology-law-looking-ahead-to-2017/

Cloud?

2011~16, Persons of interest, American science fiction crime drama television series that aired on CBS

Is it possible only Drama?

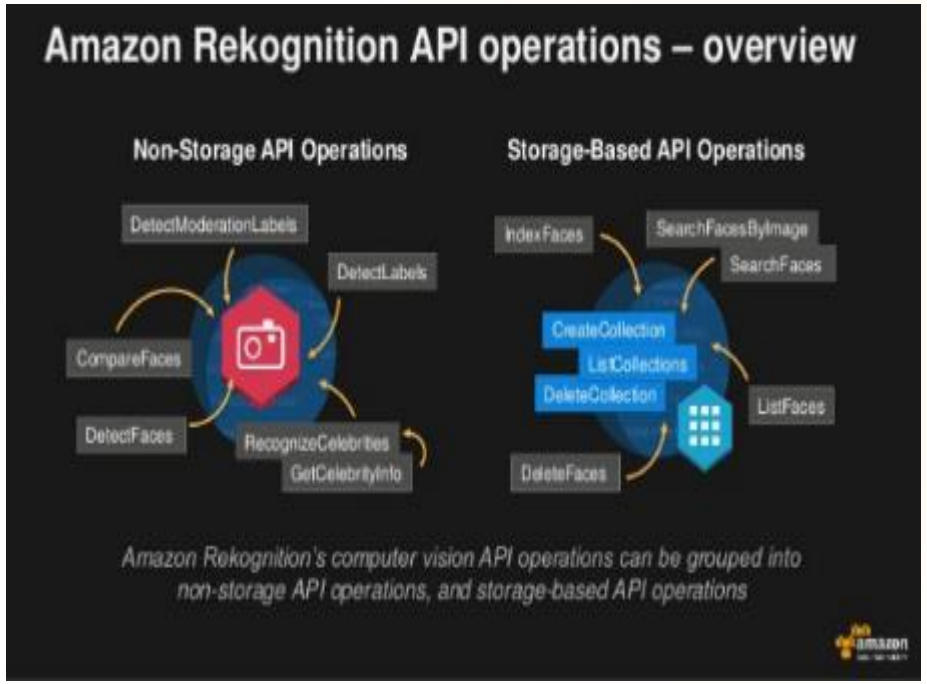


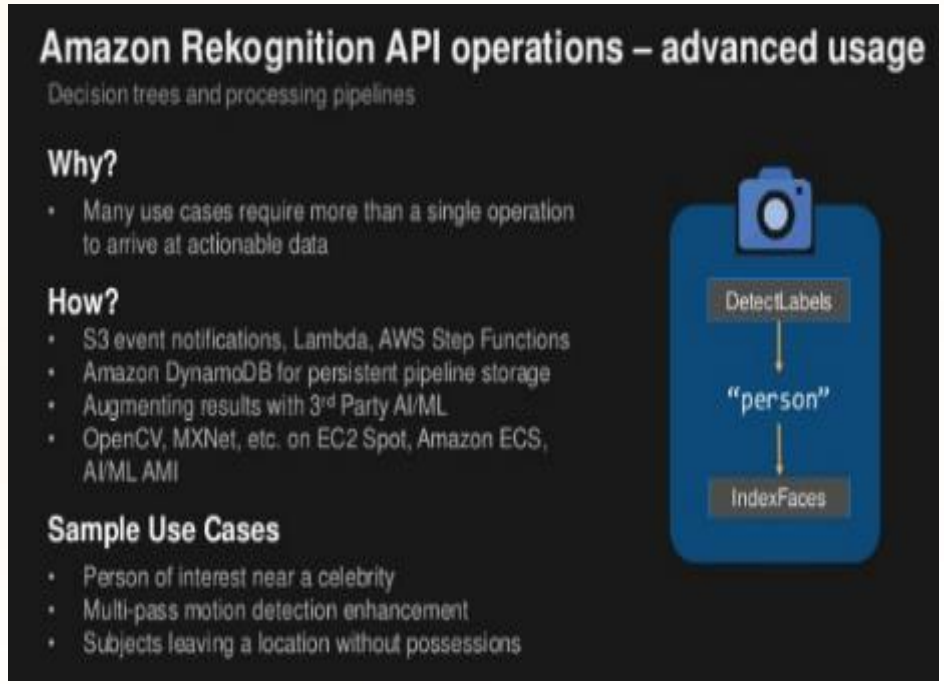
have to handle '**too much**" **data**!! and devices!! **How?**

https://vignette.wikia.nocookie.net/pediaofinterest/images/3/31/3x23_-_Samaritan_Assessment_05.png/revision/latest?cb=20140515005245
http://vignette1.wikia.nocookie.net/pediaofinterest/images/7/71/Classification_NothingToHide.png/revision/latest?cb=20140320012854

Cloud?

already Real-World, on the Cloud





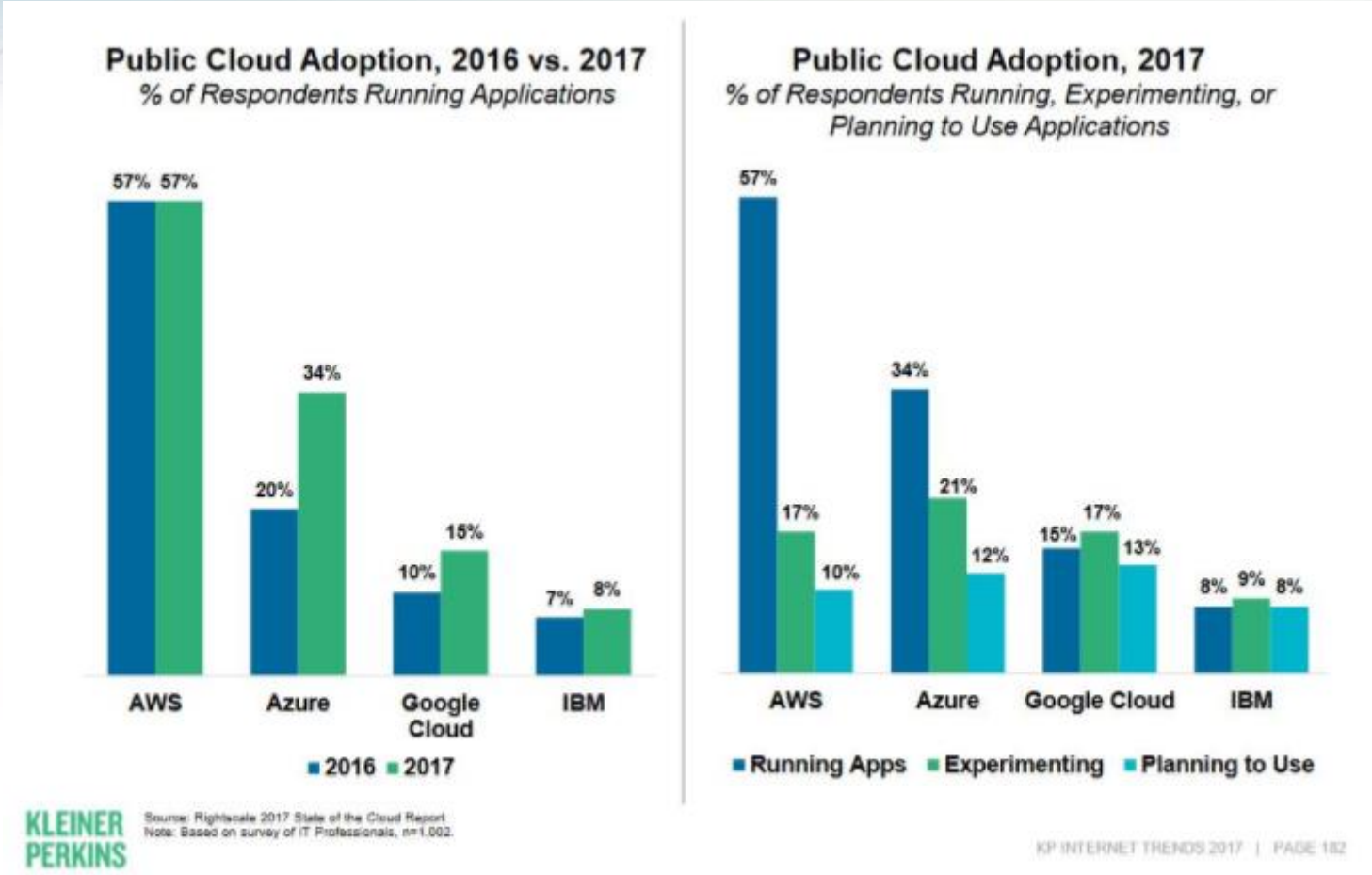
Amazon Rekognition – Deep learning-based image analysis

An Introduction to Amazon Rekognition., For Deep Learning-Based Computer Vision., David Pearson, AWS AI Services., August 14, 2017.

Cloud on the Market

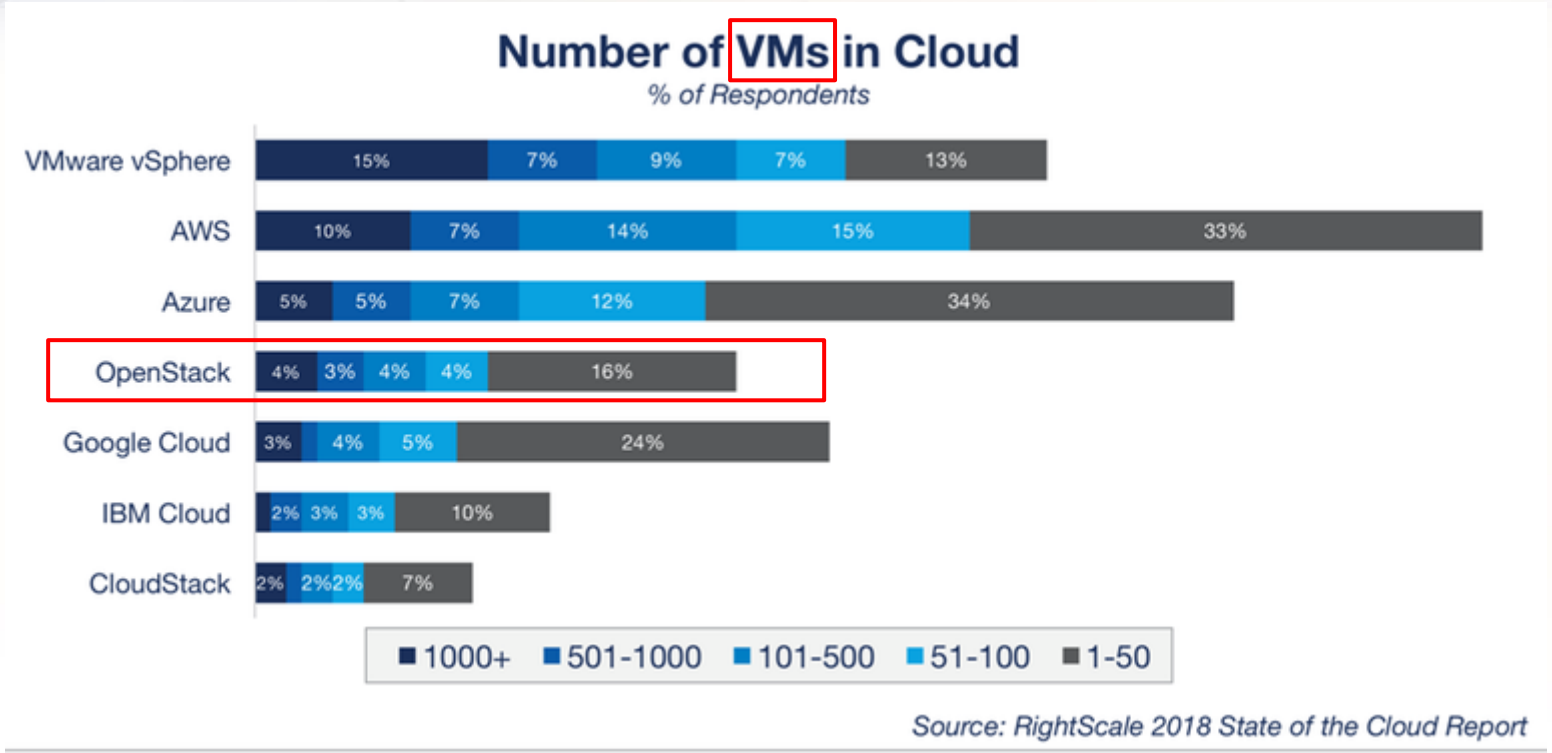
Let's look at **today's major cloud service platforms**

Cloud on the Market



https://mspoweruser.com/report-microsoft-azure-is-gaining-market-share-in-cloud-market/

Cloud on the Market



https://www.zdnet.com/article/cloud-providers-ranking-2018-how-aws-microsoft-google-cloud-platform-ibm-cloud-oracle-alibaba-stack/

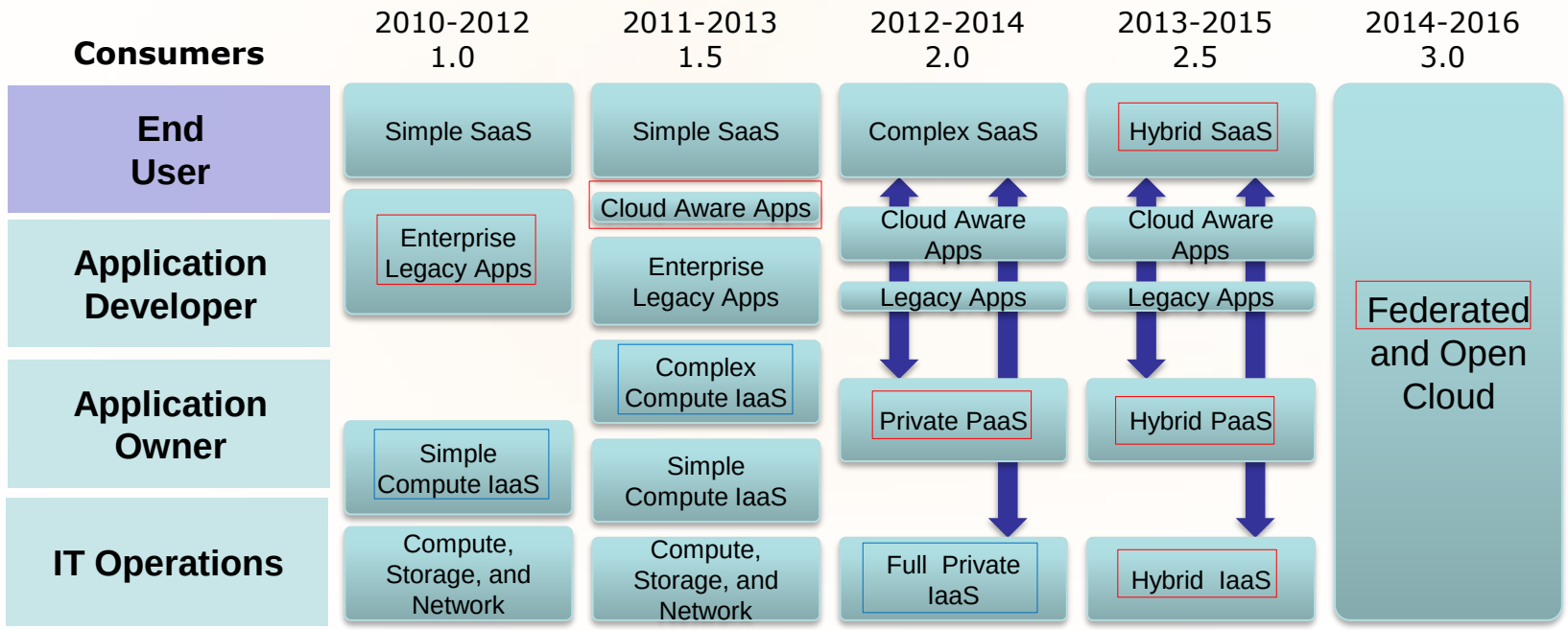
About Cloud Infrastructure

CMM - Cloud Maturity Model

CMM provides a roadmap to adoption, pointing to potential gaps and possible frameworks and solutions to consider.

Open Data Center Alliance (ODCA)

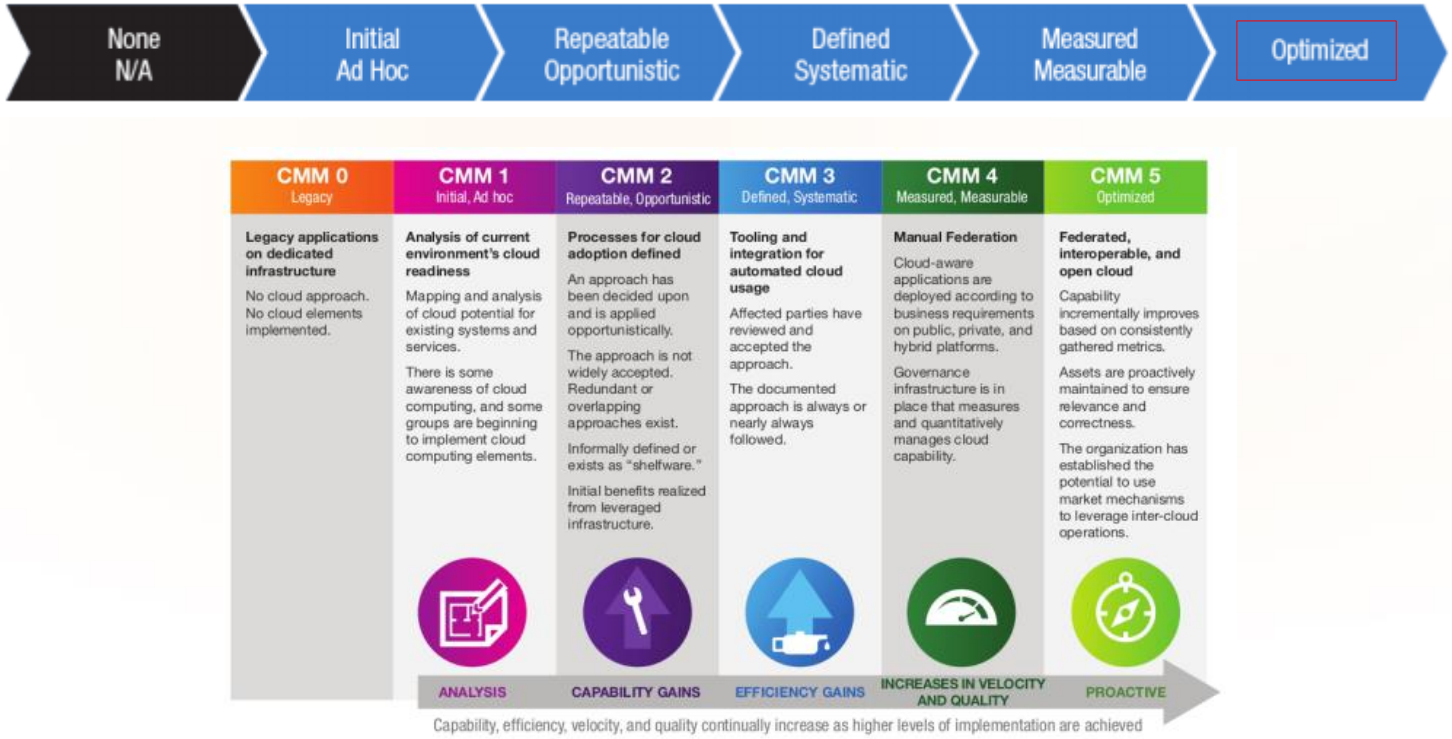
CMM - Cloud Maturity Model 1.0 ~ 3.0



Intel Cloud Summit 2012 ODCA + NAB

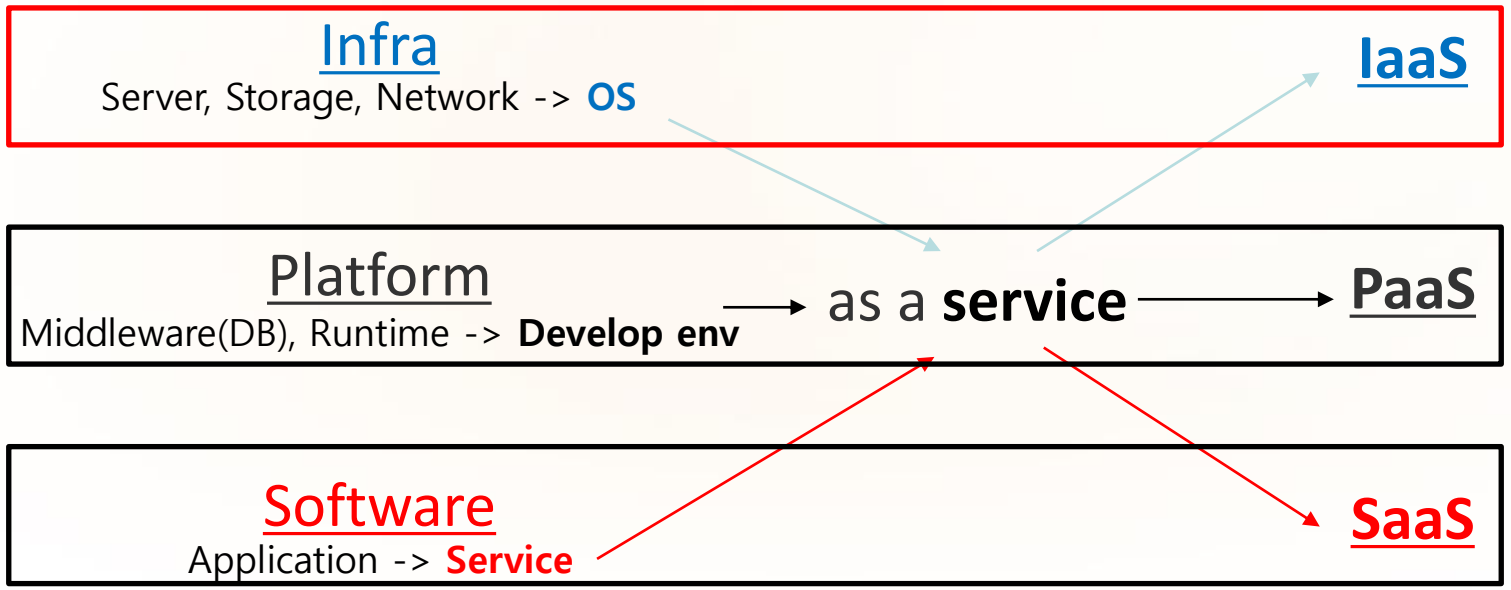
Open Alliance for Cloud Adoption (OACA)

CMM - Cloud Maturity Model 4.0 (Linux foundation)



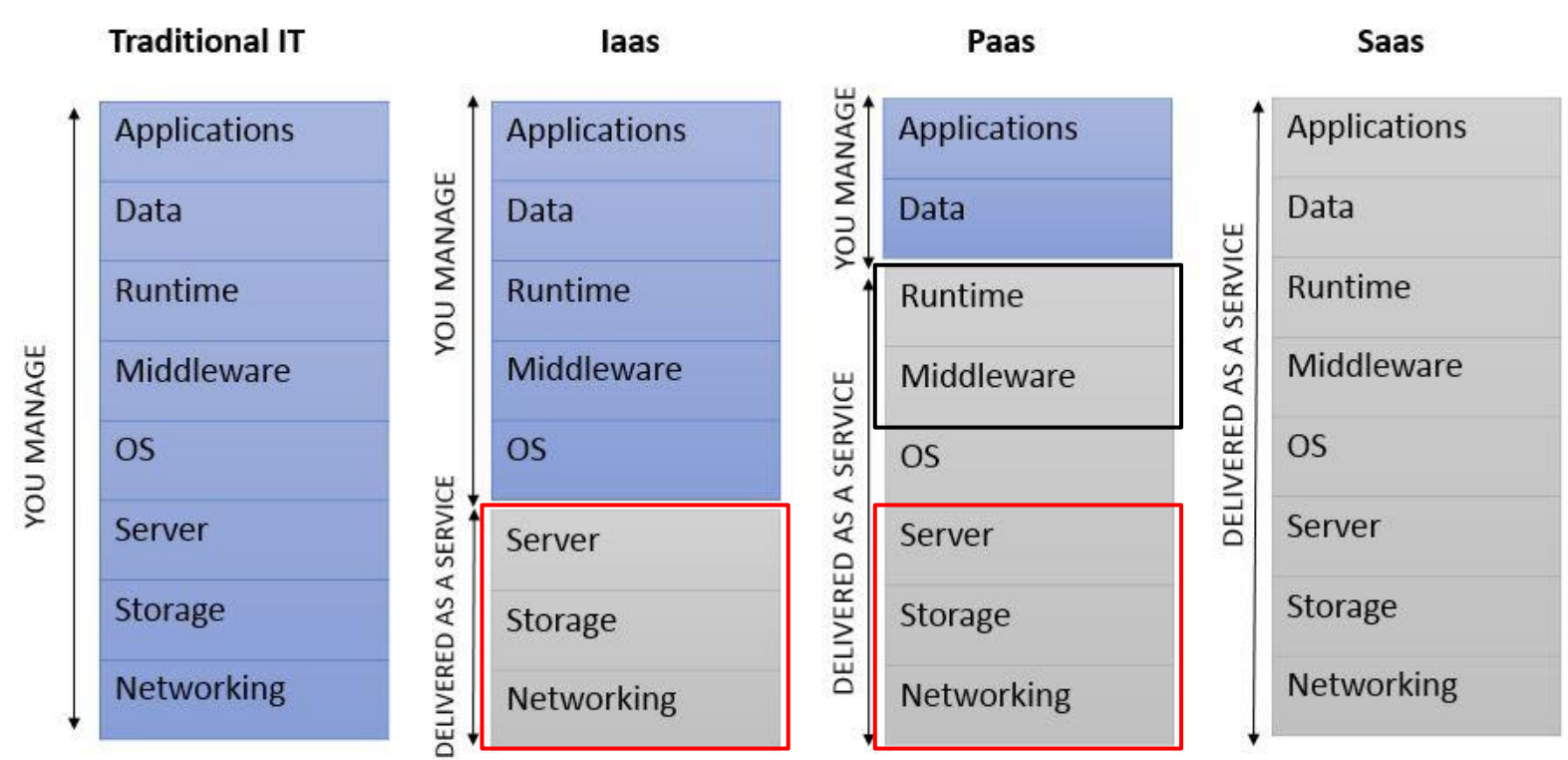
https://www.oaca-project.org/wp-content/uploads/2018/10/CloudMaturityModelUMv4-0.pdf

About Cloud Infrastructure



About Cloud Infrastructure

OpenStack is an **IaaS** (Infrastructure as a service) platform



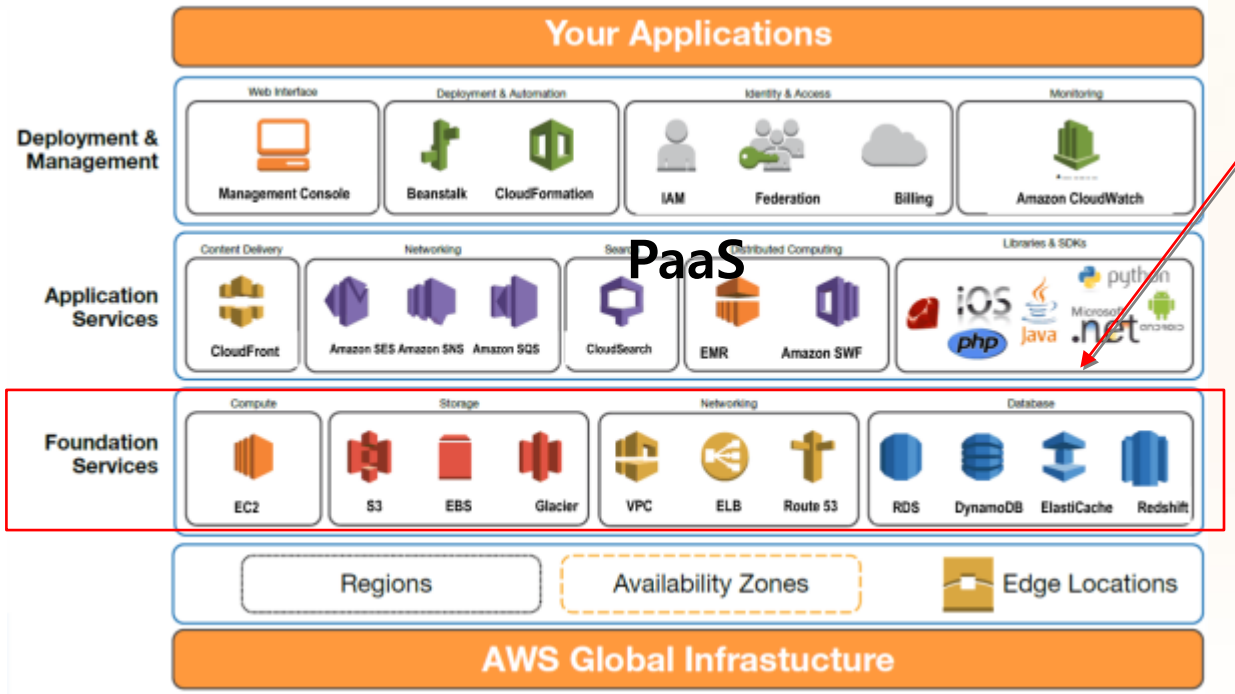
Cloud Foundry is a structured **PaaS** (platform as a service)

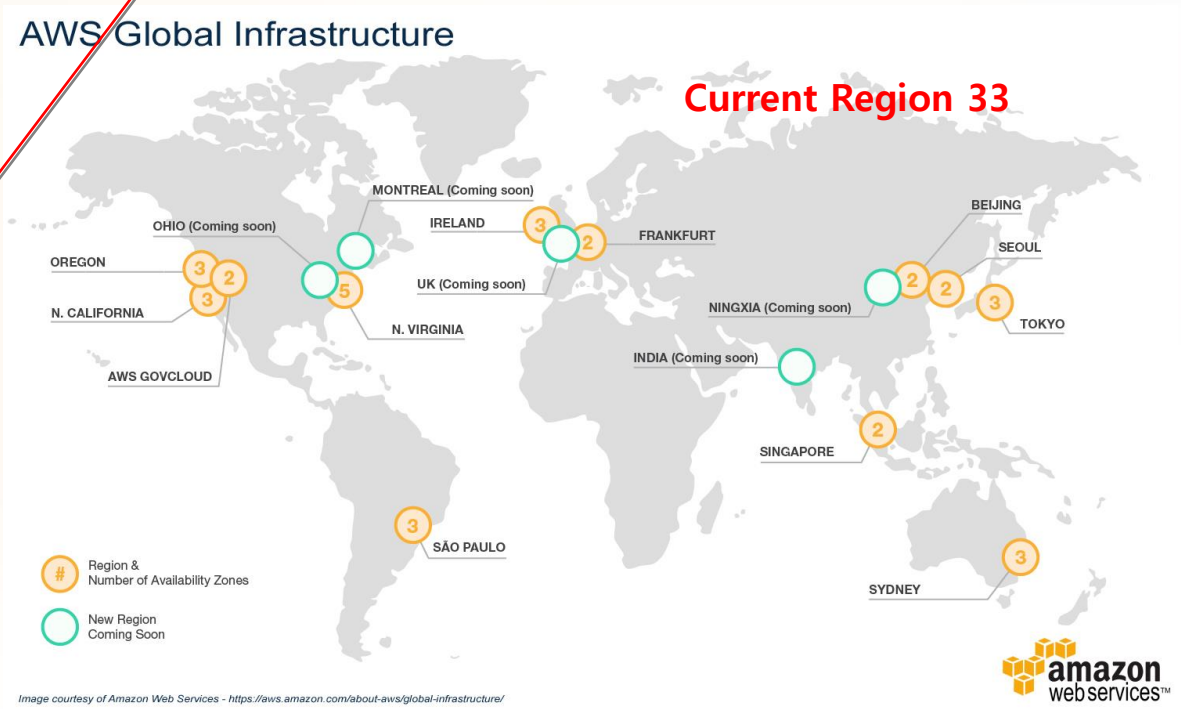
Cloud on the world

AWS (Amazon Web Service)

IaaS

PaaS





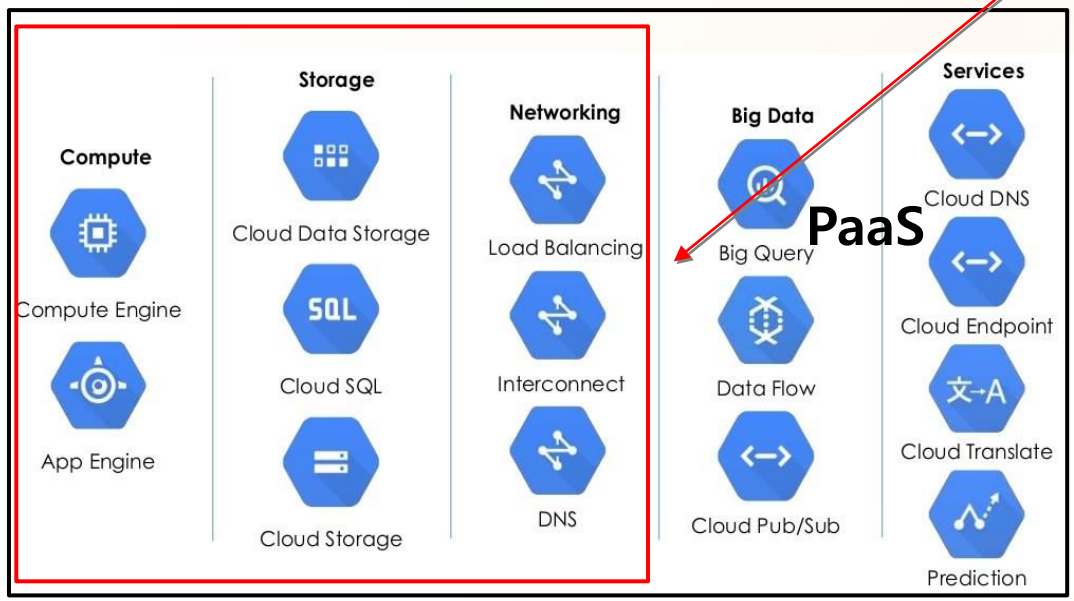
http://vmtoday.com/wp-content/uploads/sites/11/2013/08/amazon-web-services-global-infrastructure-resized-600.png

https://www.onica.com/blog/should-i-build-a-multi-region-architecture-in-aws/

Cloud on the world

Google Cloud Platform

IaaS

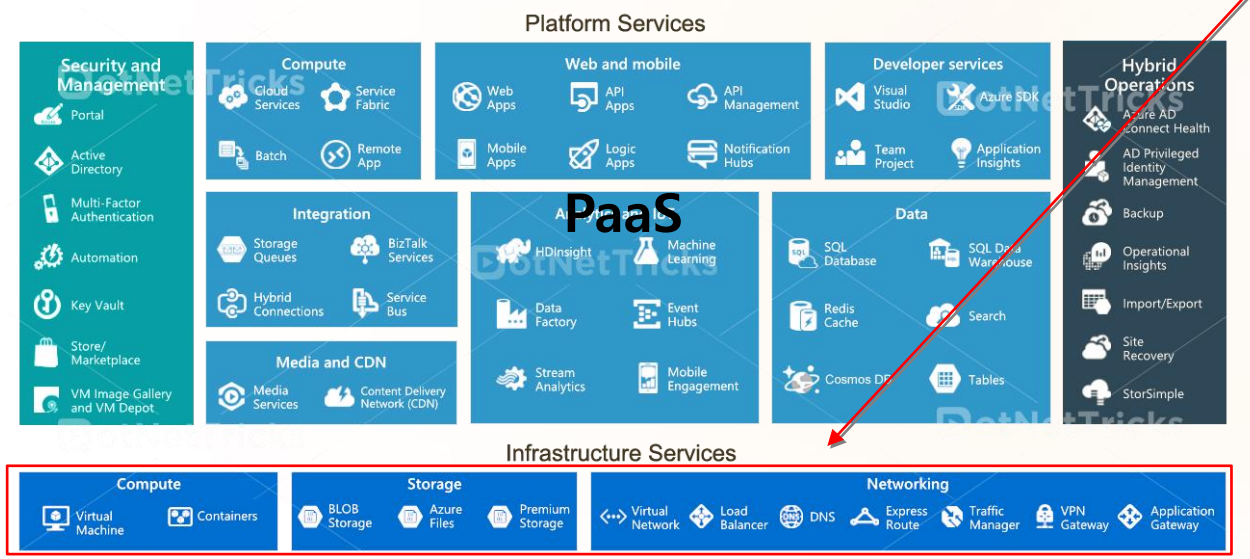


http://markoinsights.com/2016/11/11/google-cloud-update/

https://cloudplatform.googleblog.com/2018/02/GCP-is-building-its-second-Japanese-region-in-Osaka.html

Cloud on the world

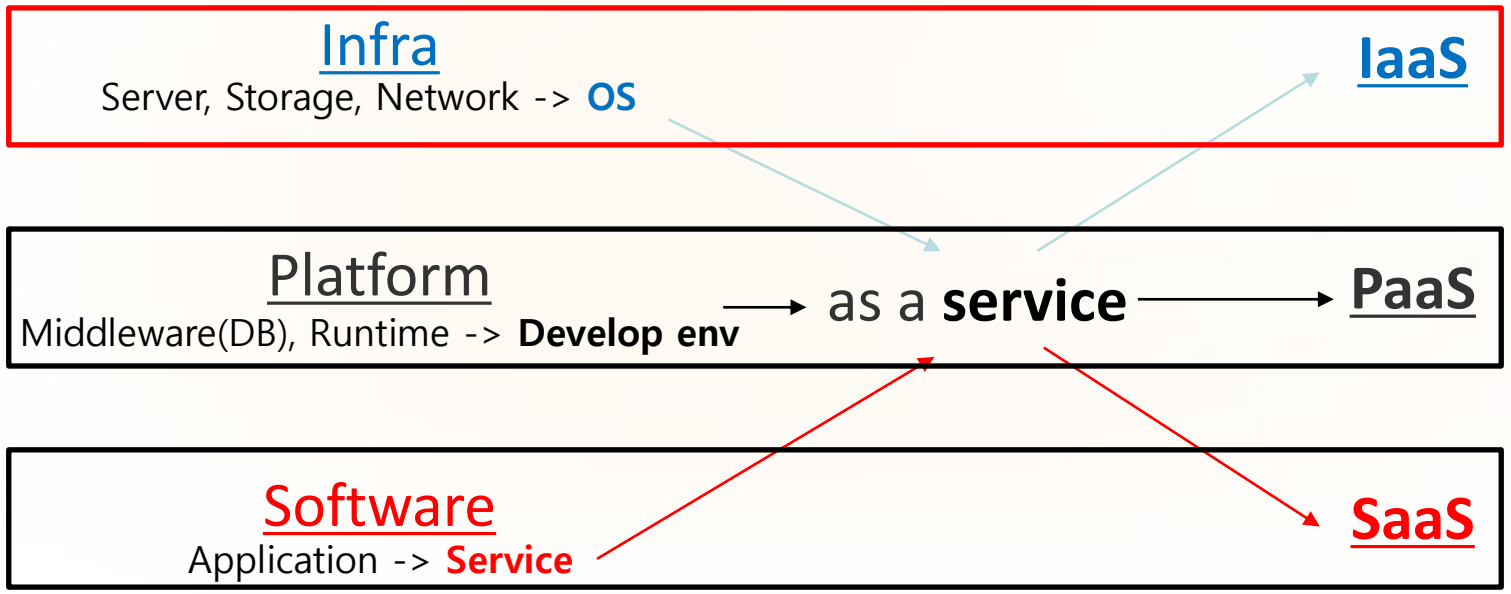
Microsoft Azure



Announced Region 54

https://www.dotnettricks.com/learn/azure/getting-started-with-microsoft-azure-platform
https://blogs.msdn.microsoft.com/cloud_solution_architect/2017/10/26/just-enough-azure-for-hadoop/

About Cloud Infrastructure, Ref. P10.



About Cloud Infrastructure , Ref. P11.

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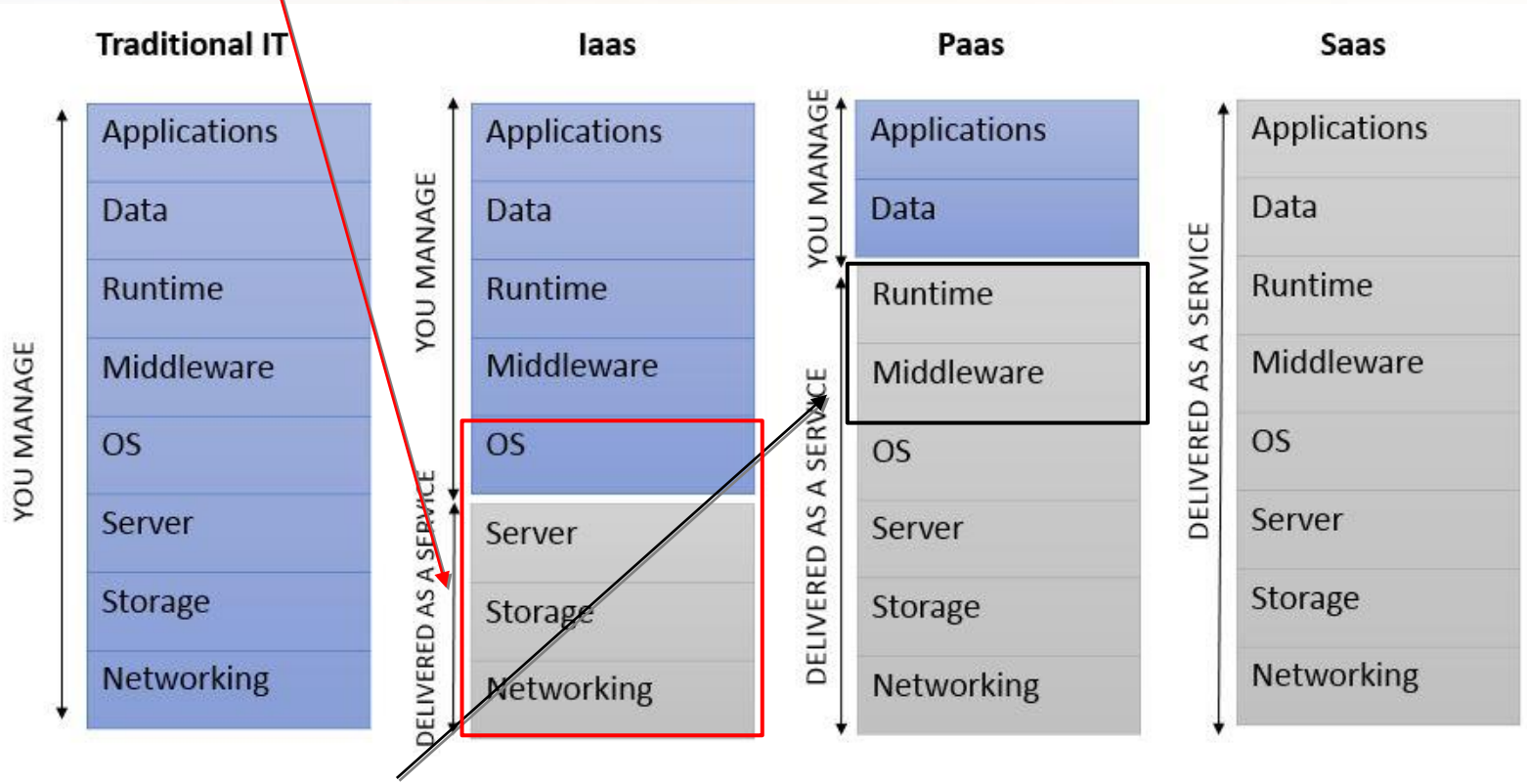
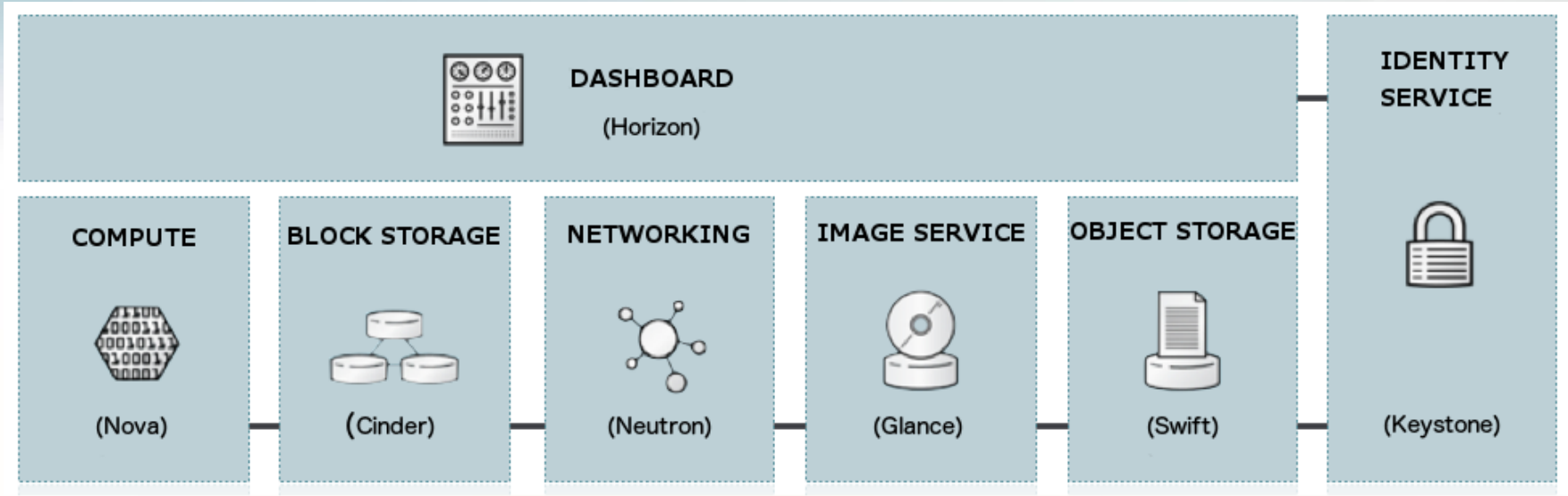


Cloud Foundry is a structured **PaaS** (platform as a service)

Deployment Cloud Infrastructure



nova	**Compute Service – management / control Compute instance, using Hypervisor – create / managing VM**
keystone	**Identity Service – Centralized authentication for each OpenStack service with ID, SQL, PAM, LDAP**
glance	Imaging Service – create and managing for OS Image for VM
neutron	Networking Service - for instances and services, based **SDN(Software Defined Networking)**
swift	Storage Service - managing Object storage for Instance
cinder	Volume Service - managing Block storage for Instance
horizon	Administrative Web-Interface(UI) Service, Service Front

https://docs.openstack.org/security-guide/introduction/introduction-to-openstack.html

Deployment Cloud Infrastructure

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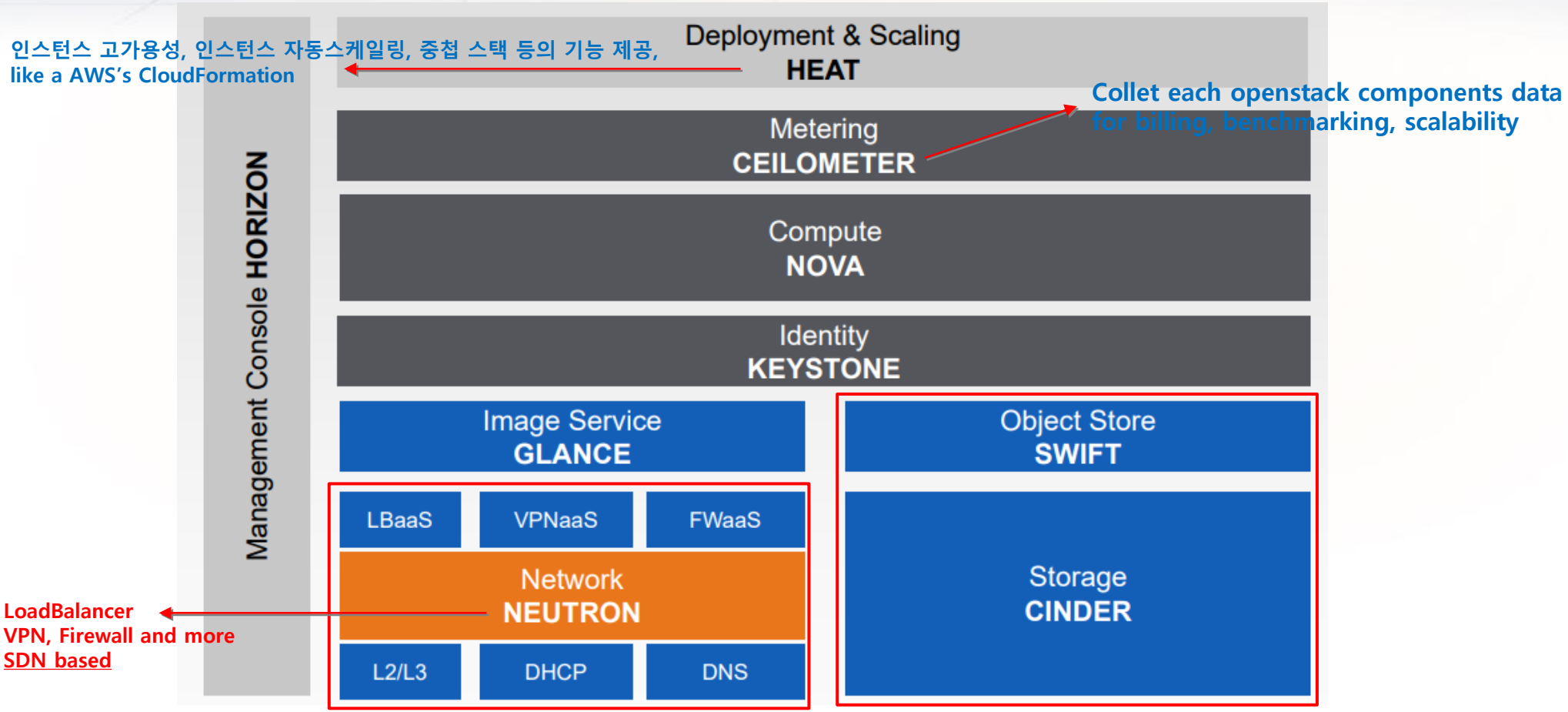
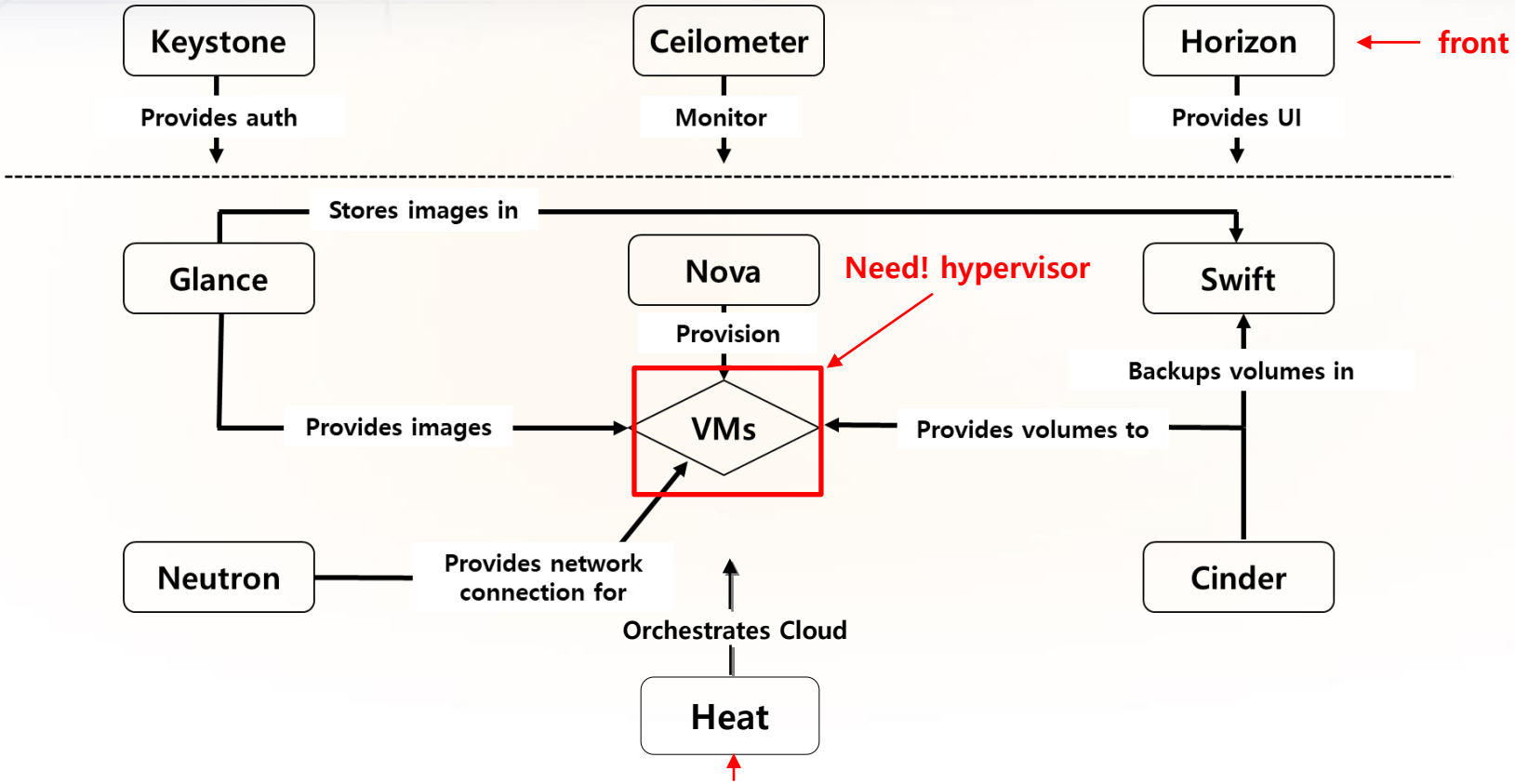


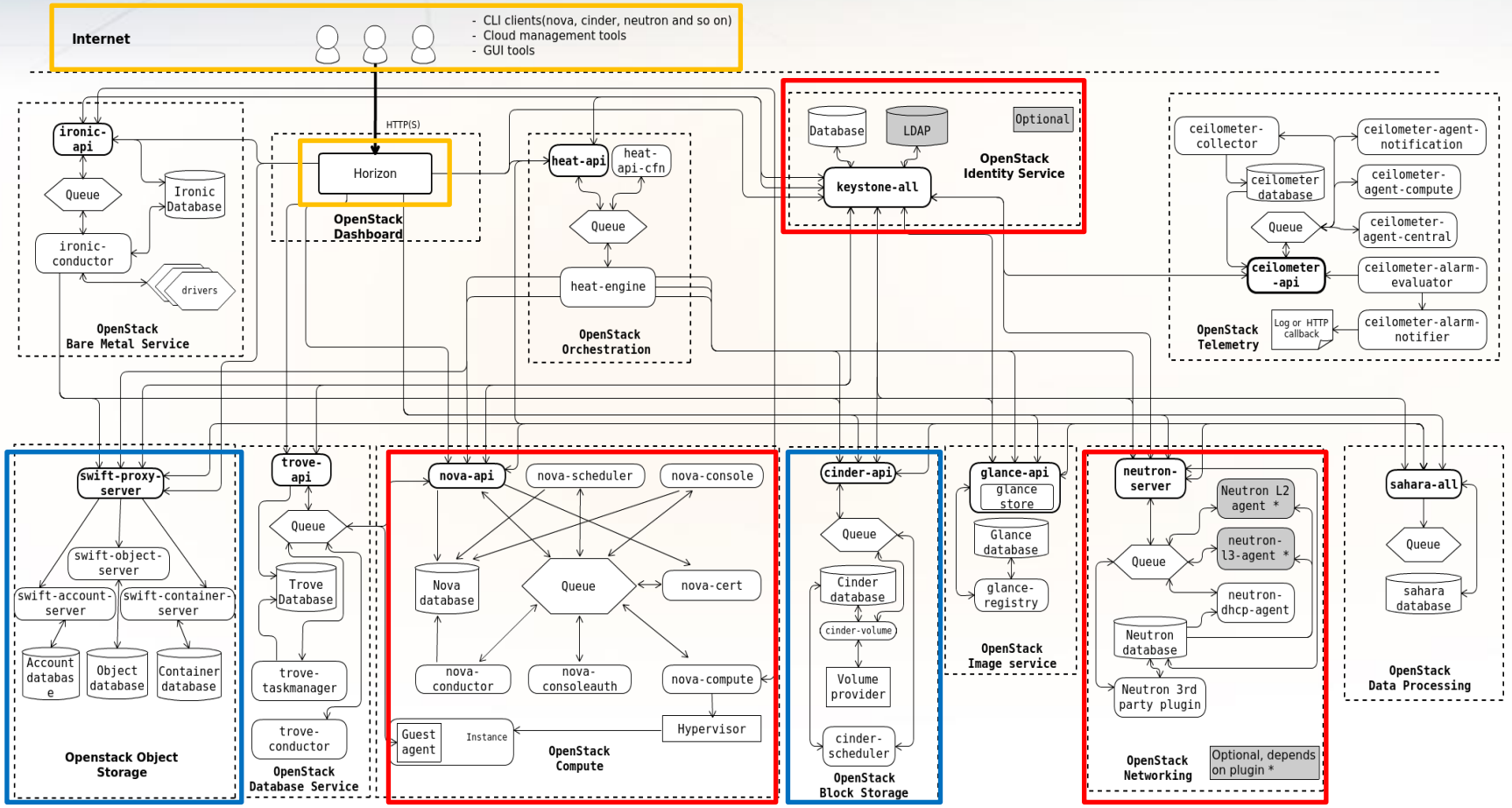
Deployment Cloud Infrastructure

OpenStack is an **IaaS** (Infrastructure as a service) platform



템플릿을 통하여 인스턴스, 유동 IP, 볼륨, 보안 그룹과 사용자 등의 대부분 OpenStack 자원 유형을 생성, -> **템플릿**은 인스턴스 고가용성, **인스턴스 자동스케일링**, 그리고 중첩 스택 등의 기능을 제공, like a AWS's **CloudFormation**

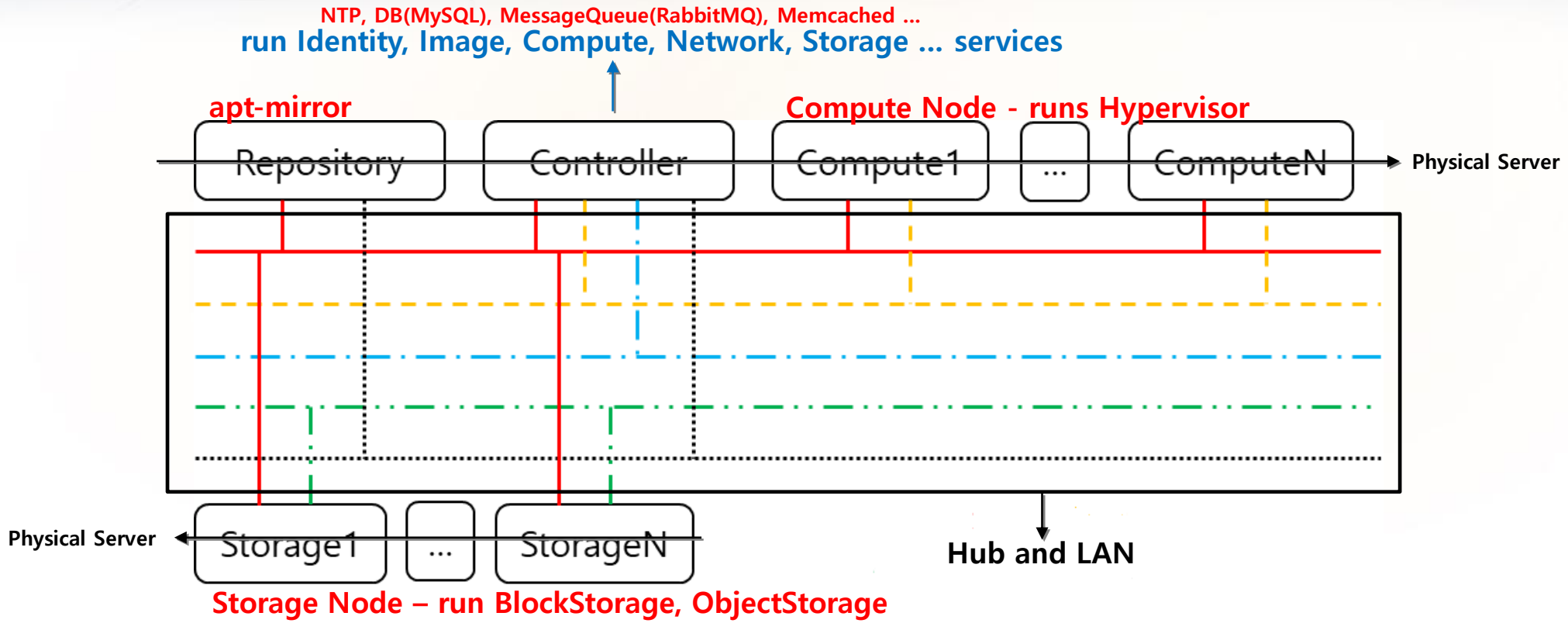
Deployment Cloud Infrastructure



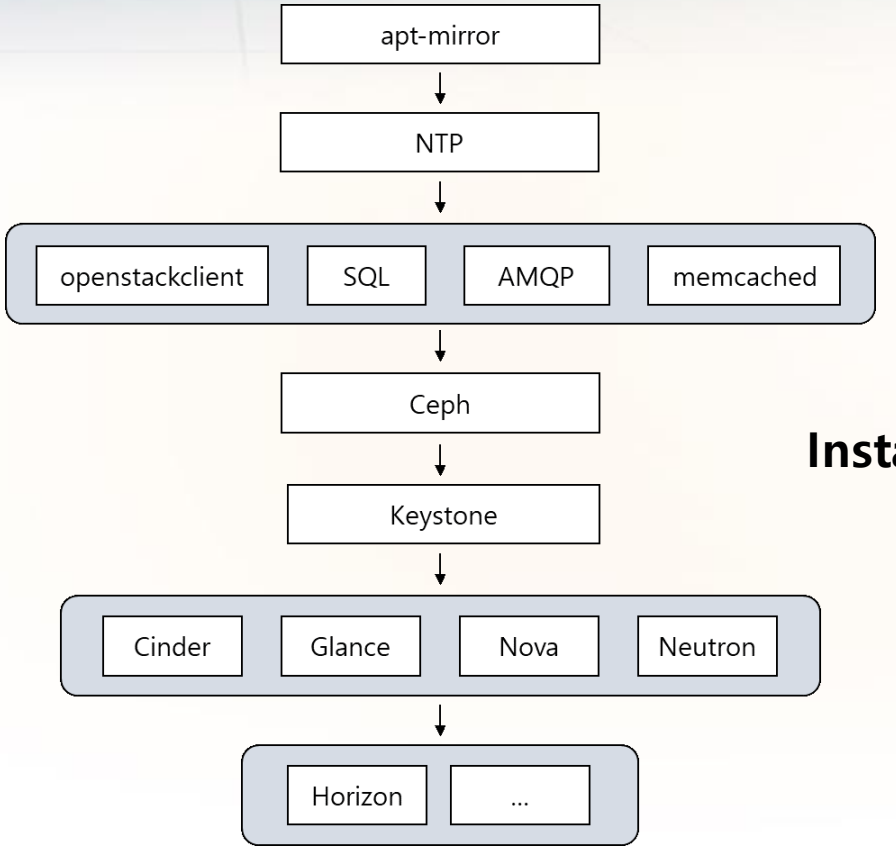
https://docs.openstack.org/install-guide/get-started-logical-architecture.html

Deployment Cloud Infrastructure

Physical Configuration



Deployment Cloud Infrastructure



Installation procedure

Deployment Cloud Infrastructure

have to know Deep 'Network related knowledge'

DevStack: https://github.com/openstack-dev/devstack

script base, easy quickly deploy for single, multi node is complicate

!!

Fuel: https://launchpad.net/fuel

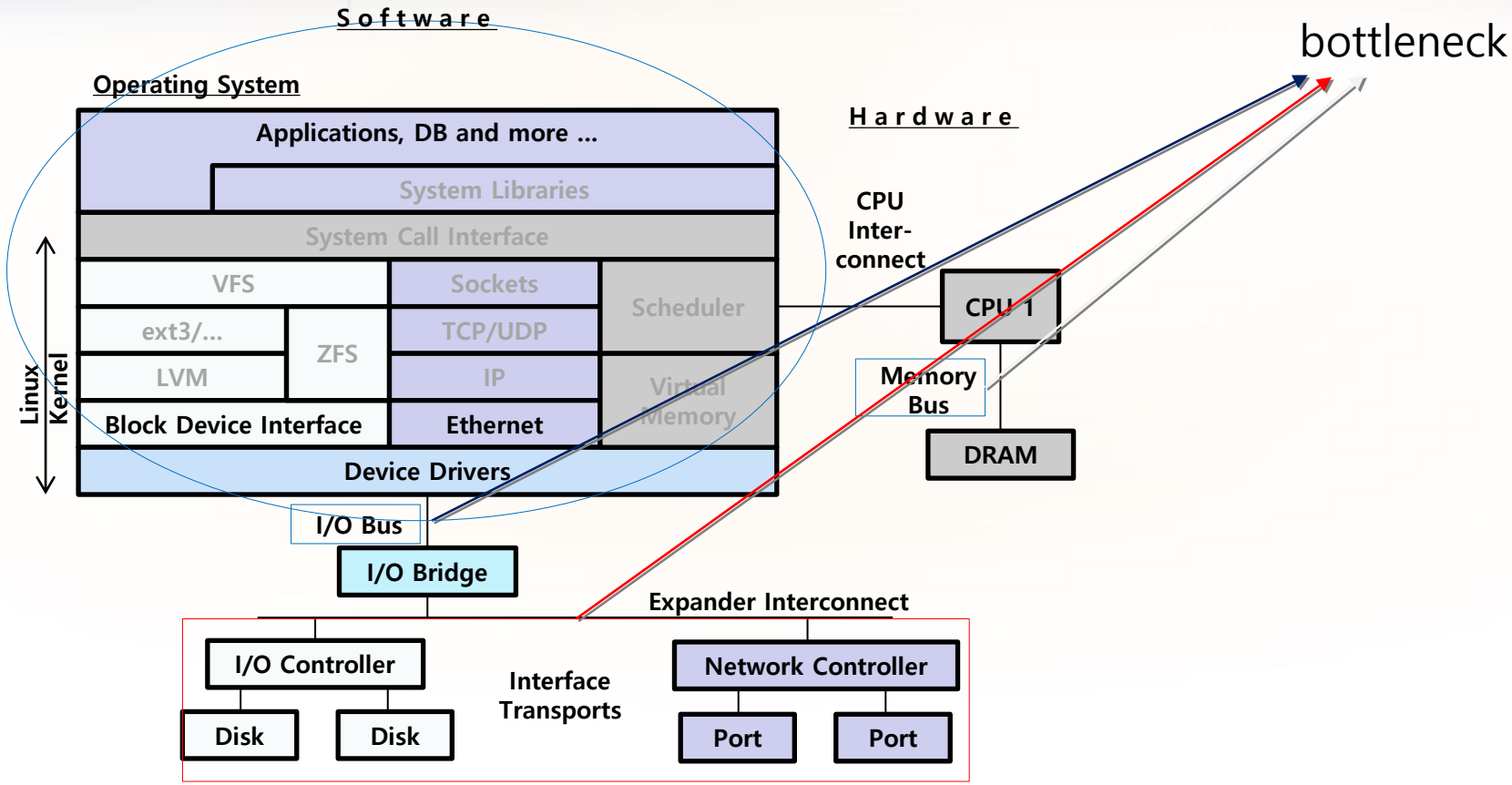
installing and managing OpenStack, just another component for managing

will release beta 'catstack'

script base, easy quickly deploy for single and multi node

https://docs.openstack.org/install-guide/get-started-logical-architecture.html

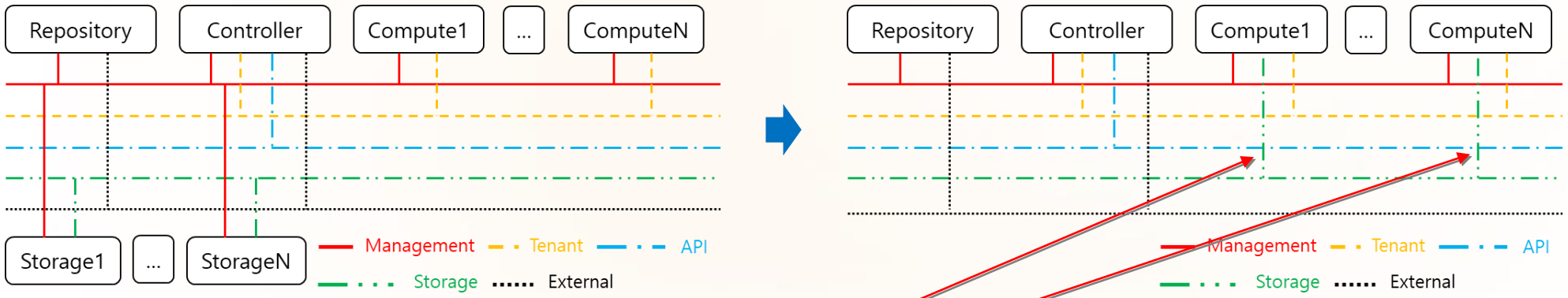
Tuning: Performance issue



http://ls.pwd.io/2013/06/linux-monitoring-tools/

Tuning: Performance issue

more Network IO Performance?



Management : Components management network
Tenant : communication between each Tenant
Storage : communication between each Ceph OSD

API : external access to OpenStack service
External : communication between Instance and external access

Tuning: Performance issue

more Storage Performance?

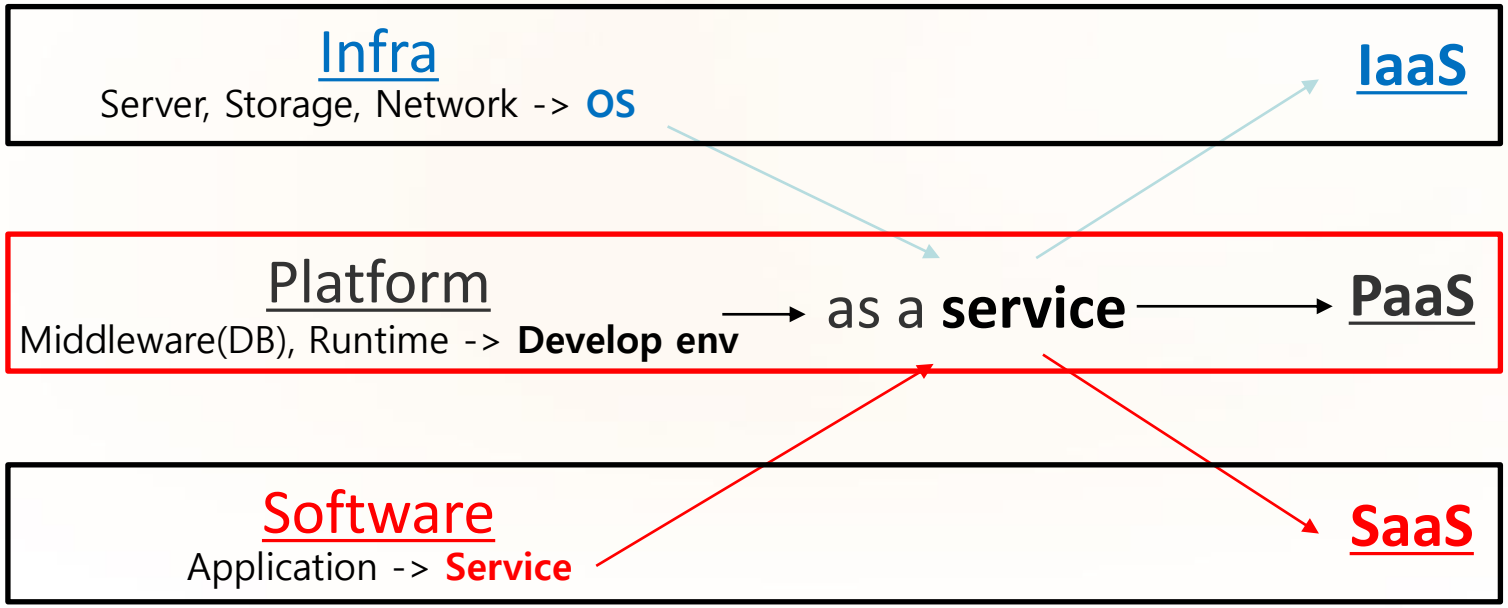
Swift = **Python**, is interpreter.

for more performance, change to "**PyPy**"
"**PyPy**" is faster is that it is a JIT(just-in-time compiler)

"**Ceph**", core = C++, and implements "object-, block- and file-level storage"

means replace Cinder(block storage) and Swift(object storage)

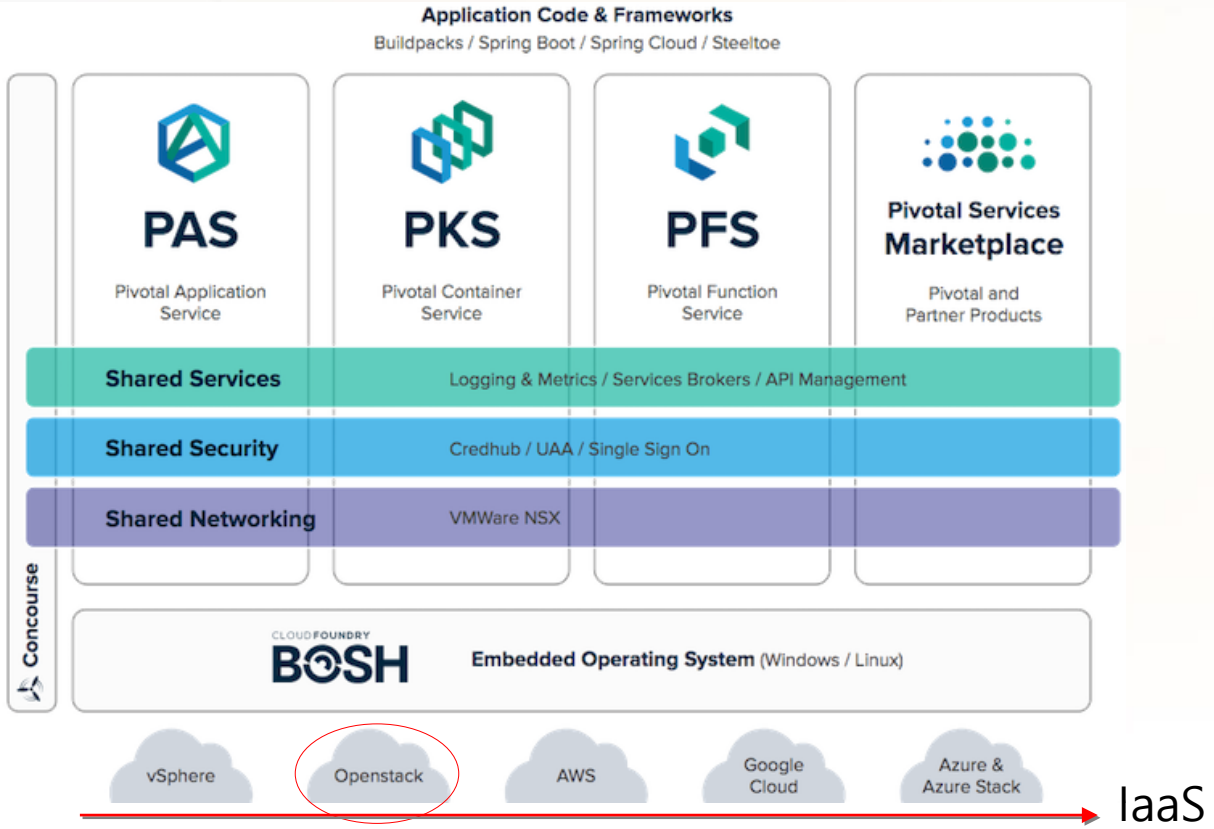
Deployment Cloud Infrastructure



PaaS : Pivotal Cloud Foundry

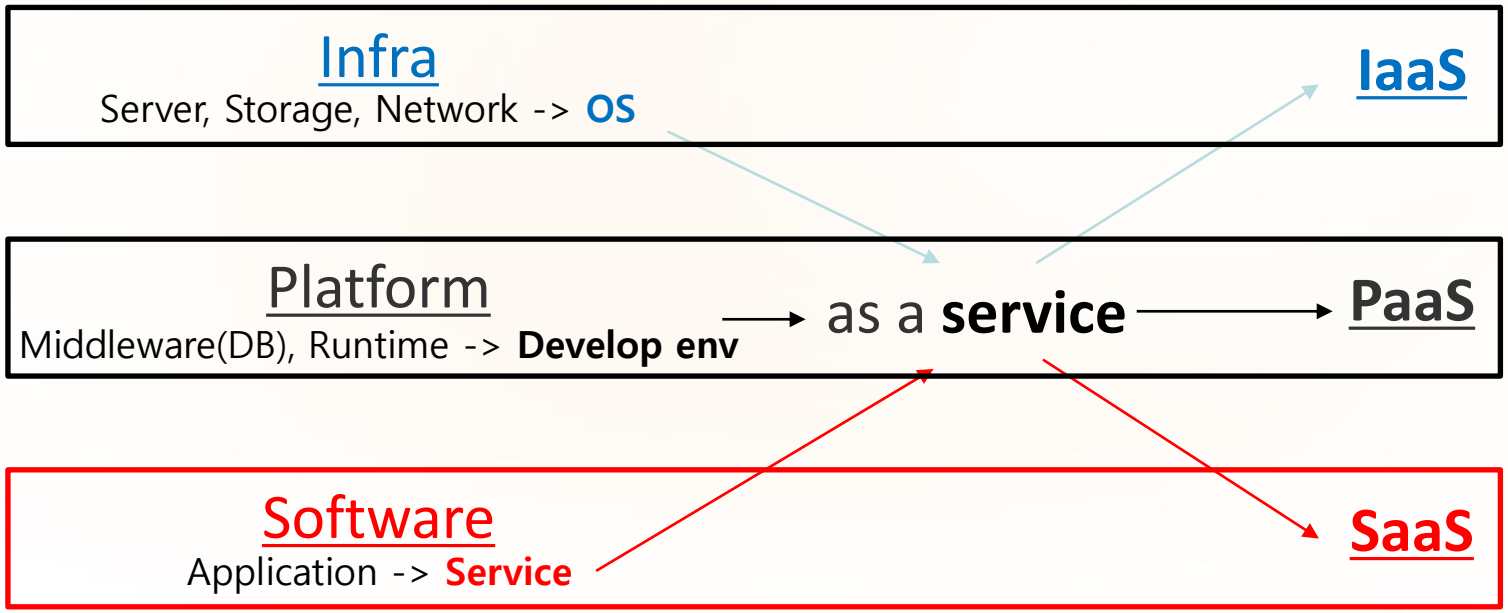
almost Project is **Opensource**

PAS: a runtime for apps, **PKS**: a runtime for containers, **PFS**: a runtime for functions



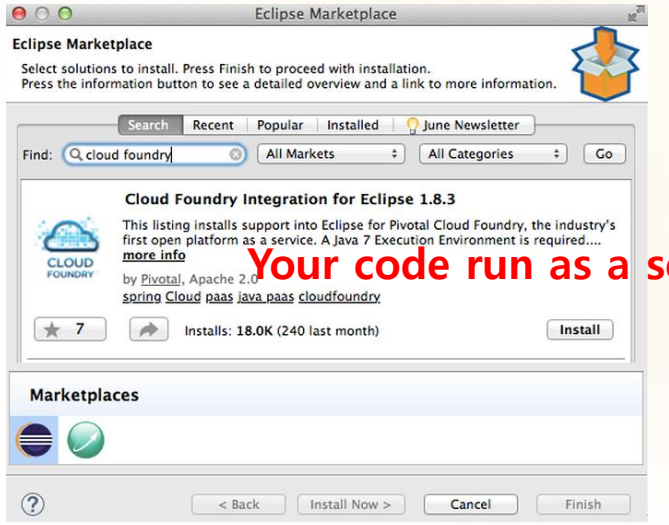
https://content.pivotal.io/blog/achieving-escape-velocity-with-pivotal-cloud-foundry-2-0

Deployment Cloud Infrastructure



SaaS (Developer)

Eclipse support Cloud Foundry(Pivotal) and IntelliJ also support PaaS



Your code run as a service immediately on the Cloud!

Q & A

Keep in touch

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youngjong@ssu.ac.kr, opensys@gmail.com