Digital IT Transformation Journey
"The truth is out there"

Philip Wong

Technical Solution Architect

Horizontal Solution Team, Greater China

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Abstract

- Enterprises are transforming their infrastructure to better fulfill the fast changing business requirements. Cloud, Automation, Machine Learning, Big Data Analytics are all the technologies every IT Architect concerns. This session summarizes our observations and learnings based on latest engagements with customers in Greater China region.

Legal Disclaimer

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From 3 perspectives

- Application

- Infrastructure

- Security & Performance

Applications in the Connected World

Traditional Applications
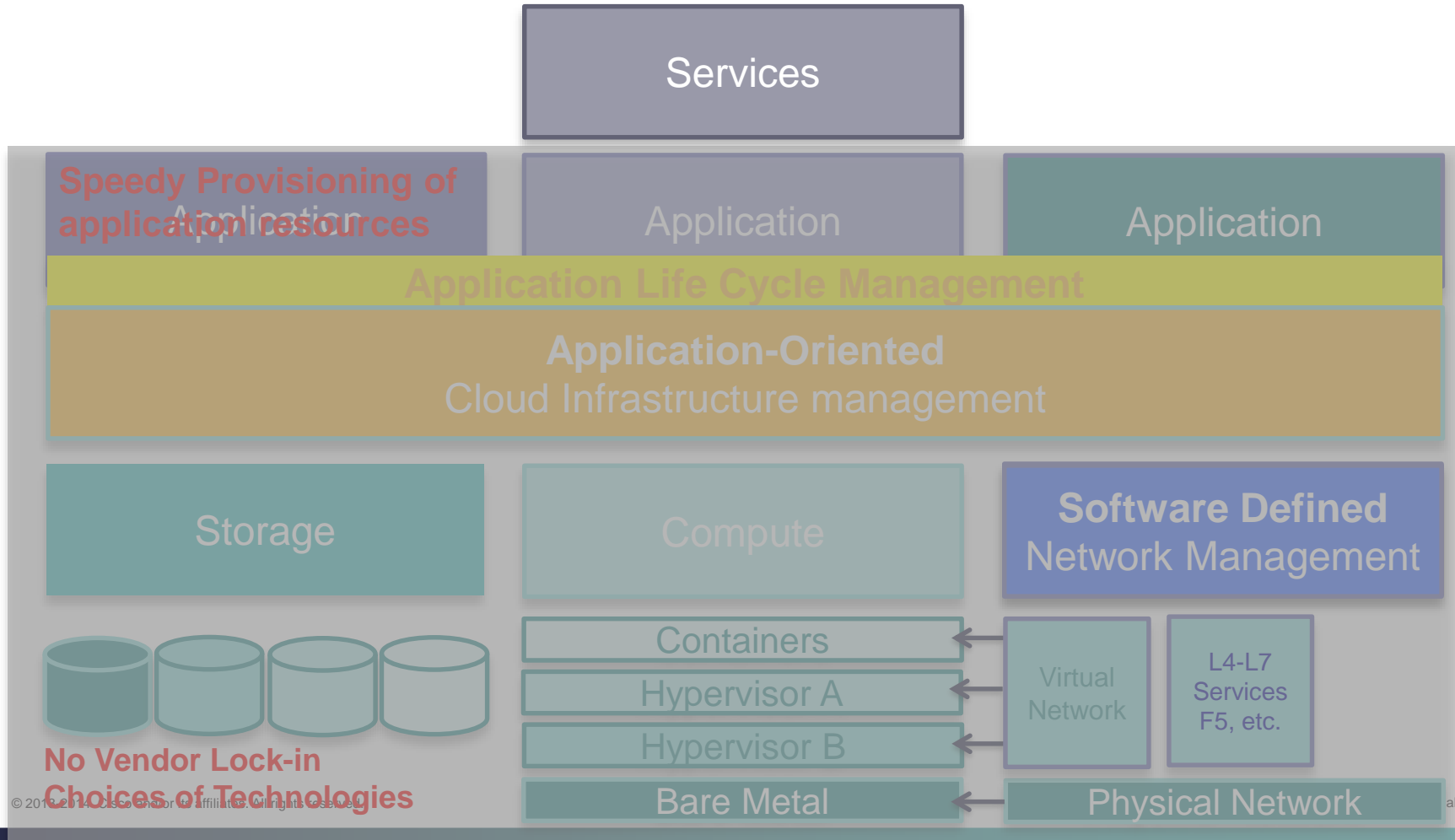
ERP, Financial, Client/Server, CRM, email, …

Cloud Native Applications

SaaS

IaaS

IoT, Big Data, Analytics, Containers, Blockchain, Gaming, ...

APP
APP
APP

Data Center

Edge / IoT

CISCO

Business only cares about providing fast and right services to clients

Services

Speedy Provisioning of application resources

Application

Application

Application

Application Life Cycle Management

Application-Oriented
Cloud Infrastructure management

Storage

Compute

Software Defined
Network Management

Containers

Hypervisor A

Hypervisor B

Bare Metal

Virtual Network

L4-L7 Services F5, etc.

Physical Network

No Vendor Lock-in Choices of Technologies

Application Evolution is the motor driving all gears

Boot-up time too slow!

Too much overhead!

VMs
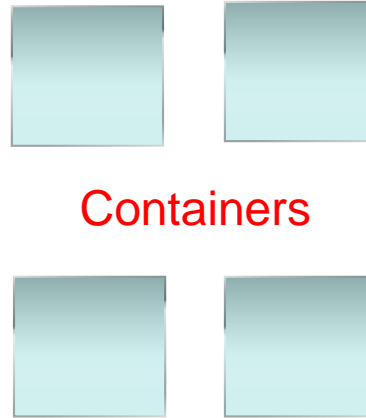
Containers

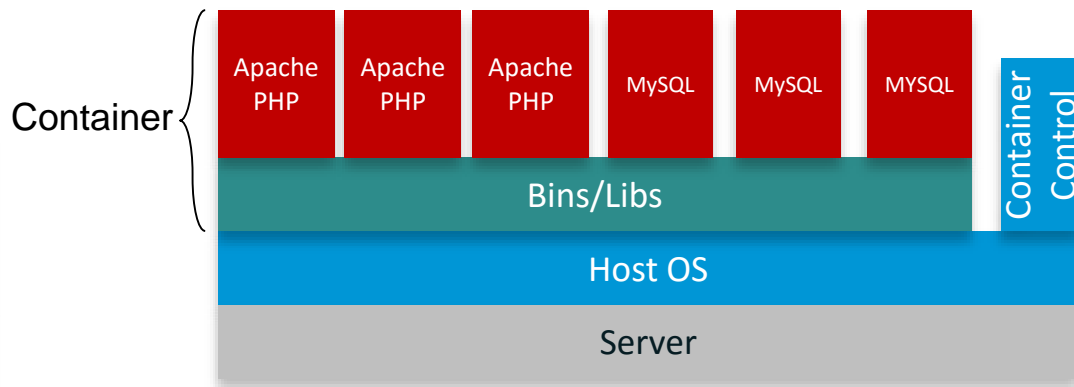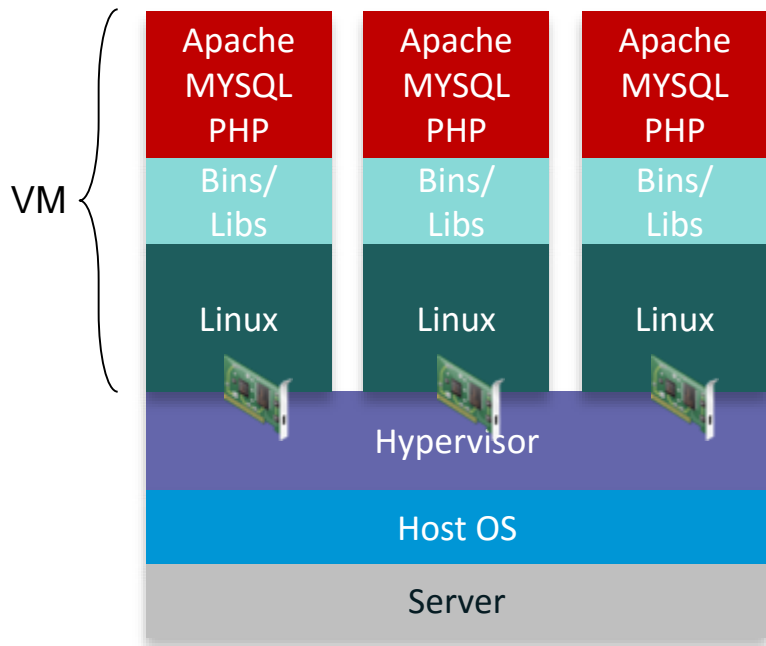Serverless

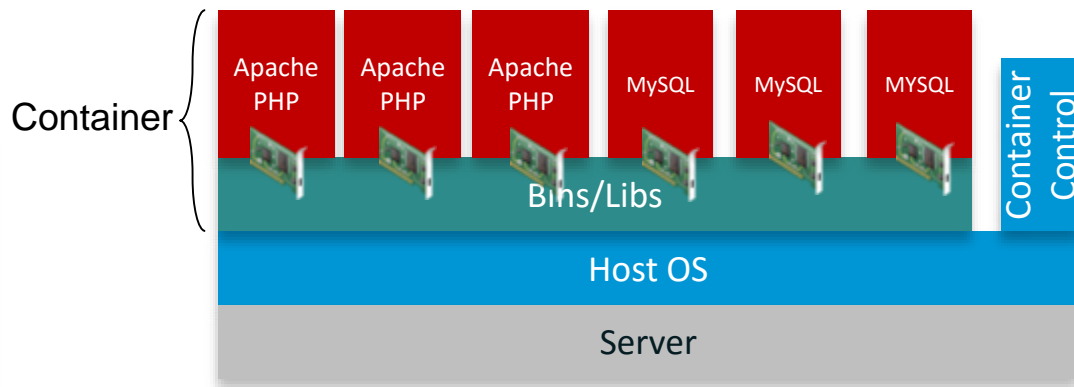High maintenance!

"Containerizing" a Simple Web App

VM

Apache MYSQL PHP	Apache MYSQL PHP	Apache MYSQL PHP
Bins/Libs	Bins/Libs	Bins/Libs
Linux	Linux	Linux

Hypervisor
Host OS
Server
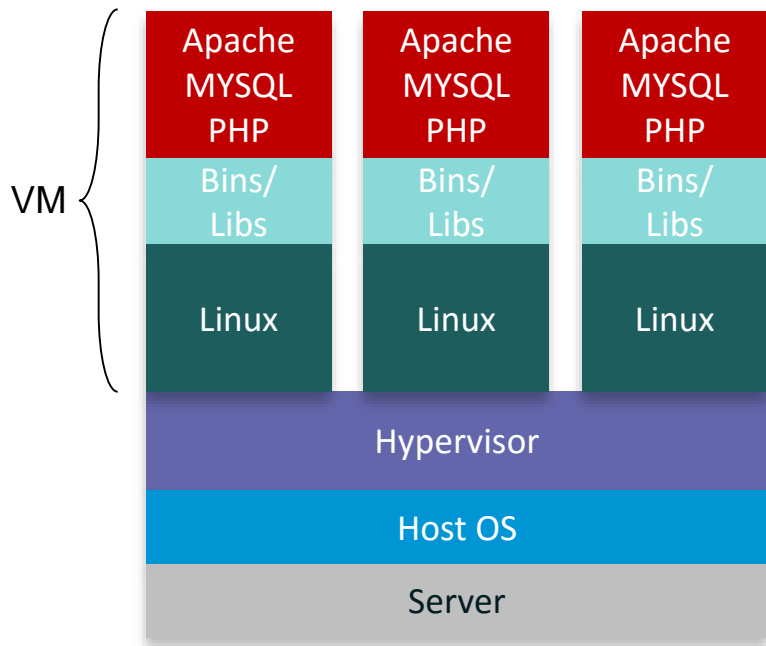
Containers are isolated but share OS and where appropriate bins/libraries

Container

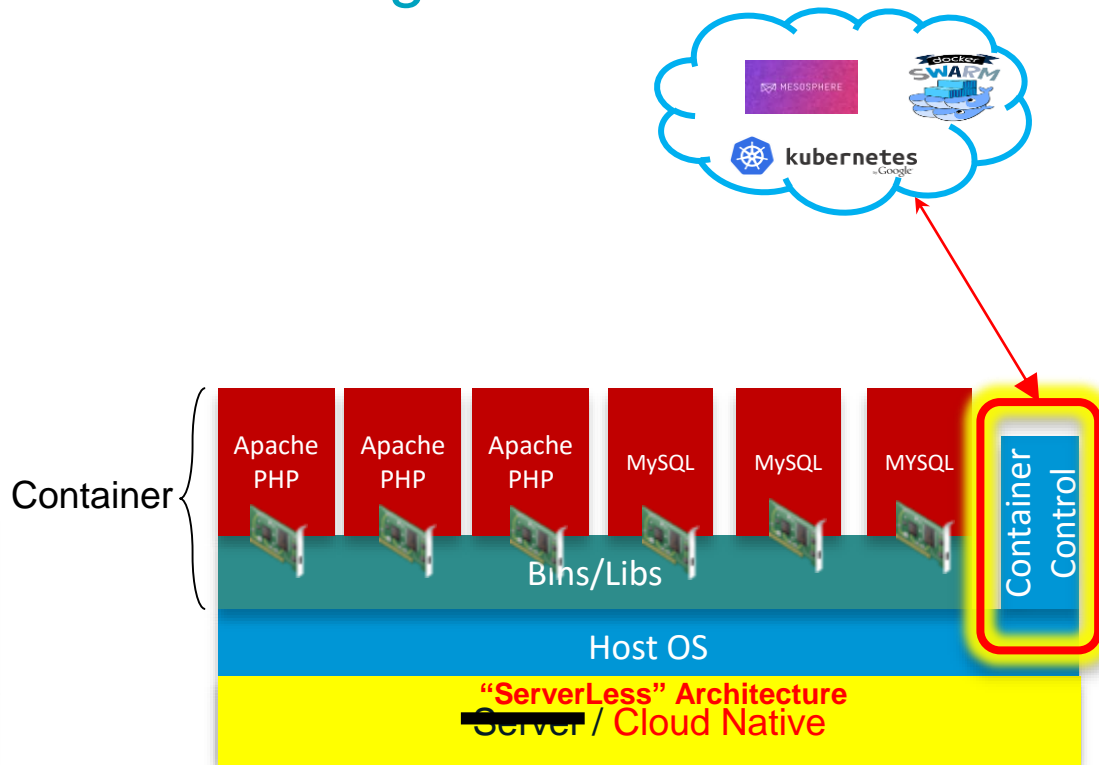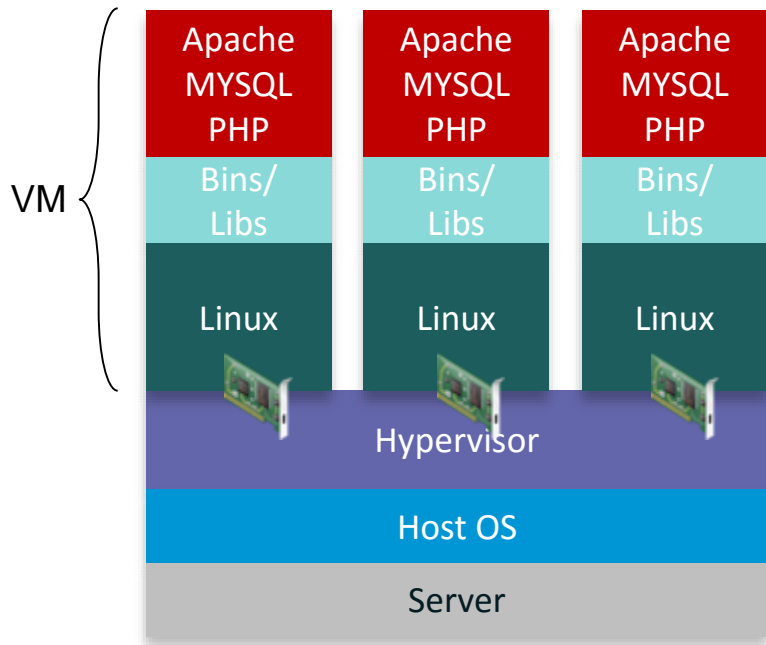| Apache PHP	Apache PHP	Apache PHP	MySQL	MySQL	MySQL	Container Control
Bins/Libs						

Host OS
Server

"Containerizing" a Simple Web App

Containers are isolated but share OS and where appropriate bins/libraries
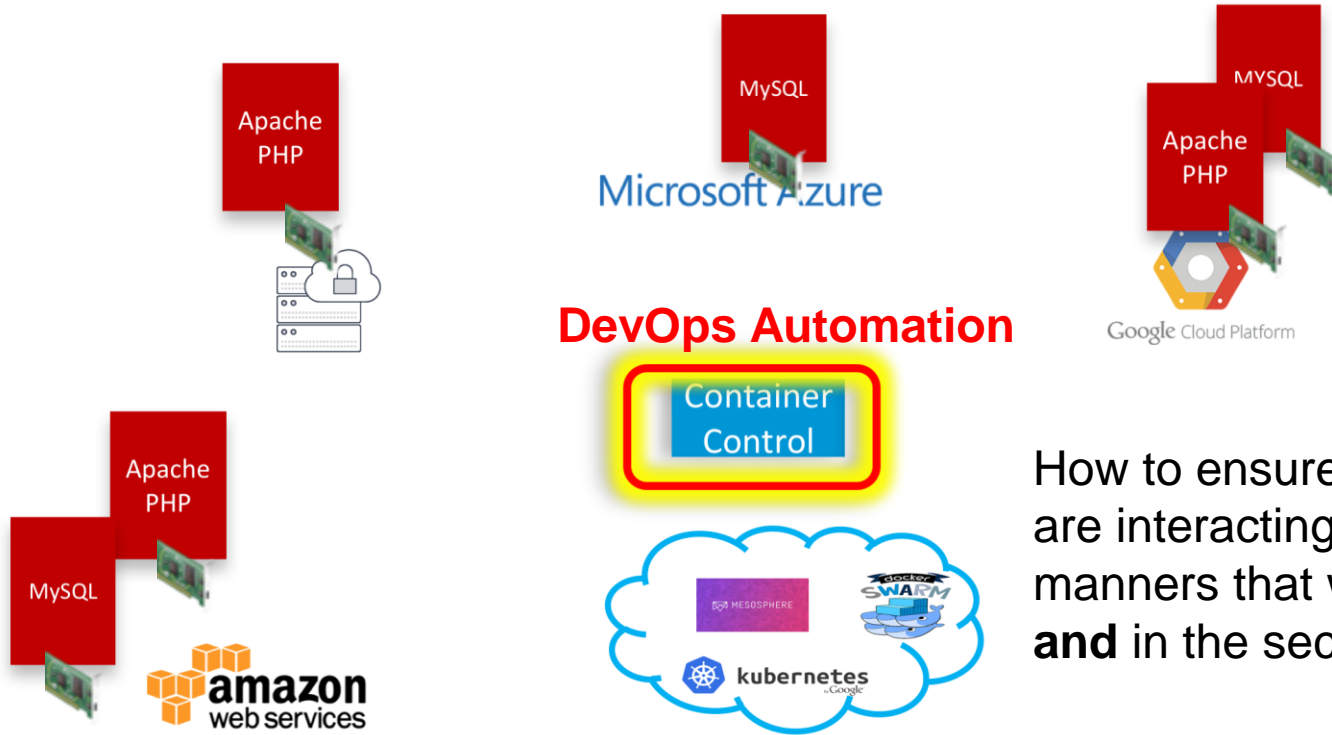
Transforming to "Server-less" without geo-boundaries

VM

Apache MYSQL PHP | Apache MYSQL PHP | Apache MYSQL PHP

Bins/Libs | Bins/Libs | Bins/Libs

Linux | Linux | Linux

Hypervisor

Host OS

Server

Container

Apache PHP | Apache PHP | Apache PHP | MySQL | MySQL | MySQL | Container Control

Bins/Libs

Host OS

"ServerLess" Architecture
~~Server~~ / Cloud Native

Microsoft Azure

amazon web services

Google Cloud Platform

Transforming to "Server-less" without geo-boundaries

Container

Apache PHP

Apache PHP

Apache PHP

MySQL

MySQL

MYSQL

Container Control

Bins/Libs

Host OS

"ServerLess" Architecture
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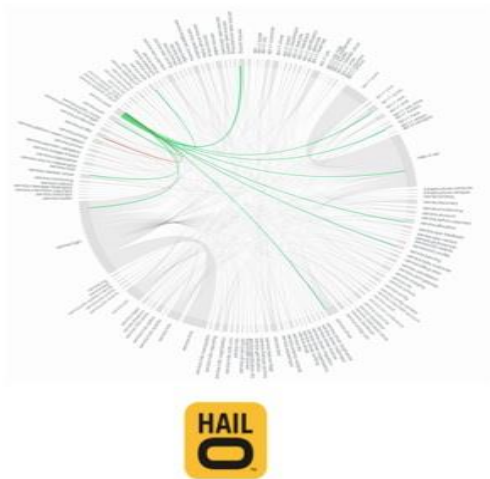
Transforming to "Server-less" without geo-boundaries

DevOps Automation

How to ensure these micro-services are interacting according to the manners that we want them to be **and** in the secured manners?

Micro-services = LOTS of east west traffic
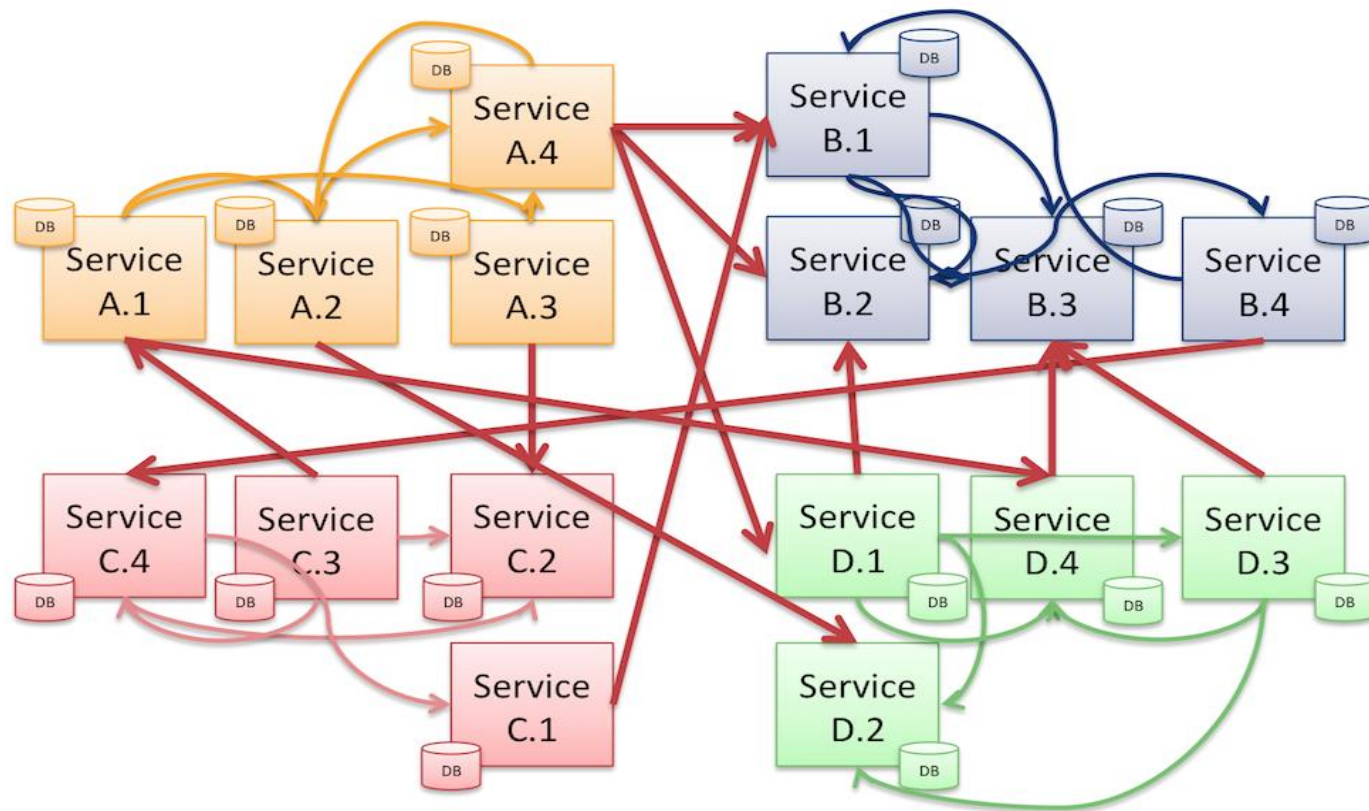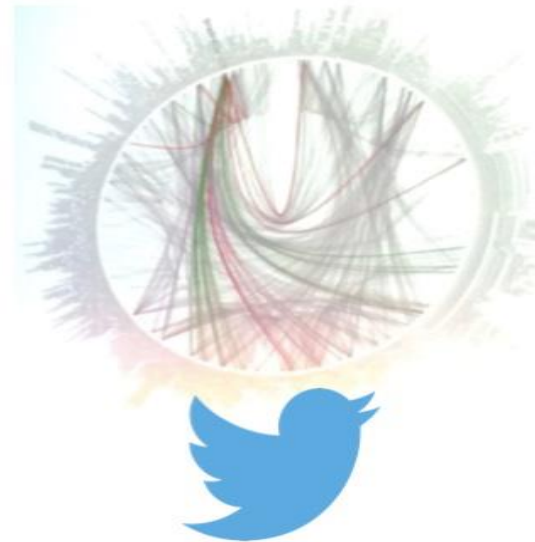
Operating the Death Star

450 microservices

500+ microservices
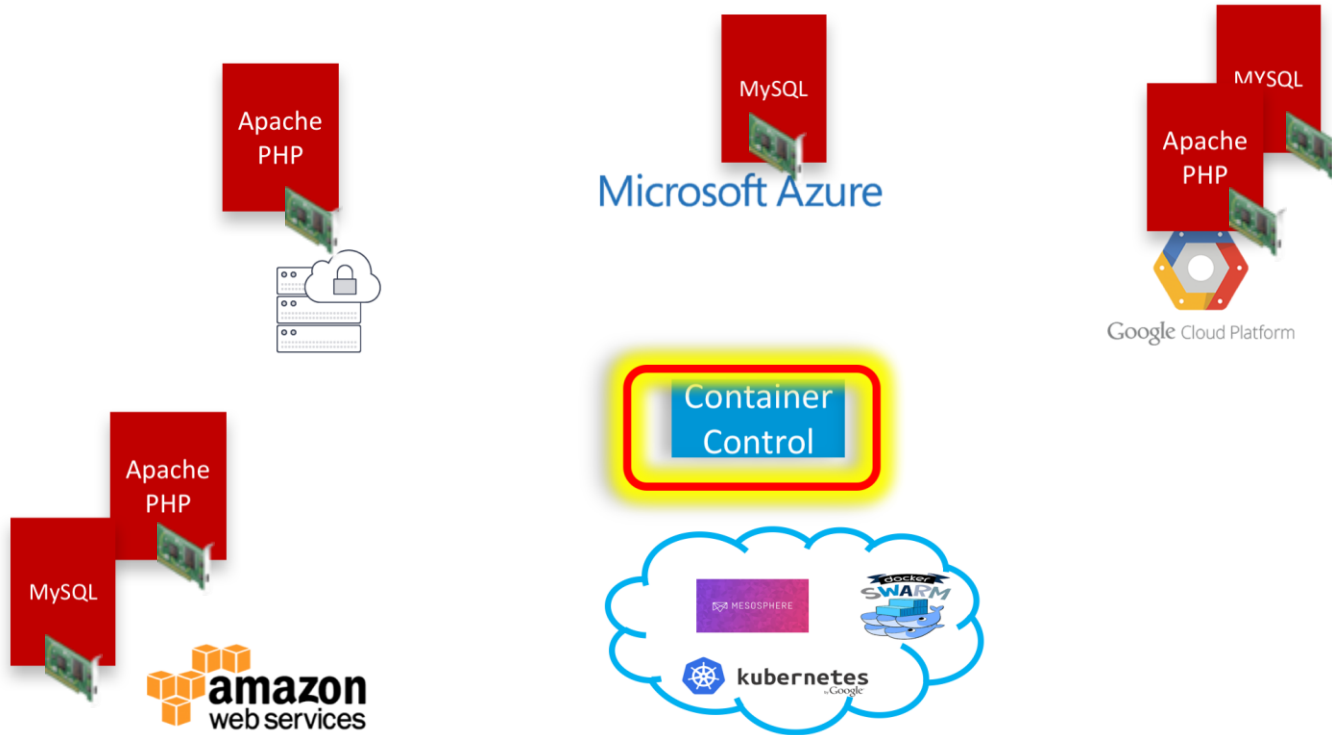
500+ microservices

HAIL
O

NETFLIX

Why Go Micro-services?

- Highly Scalable

- Cloud Native

- Highly Resilient
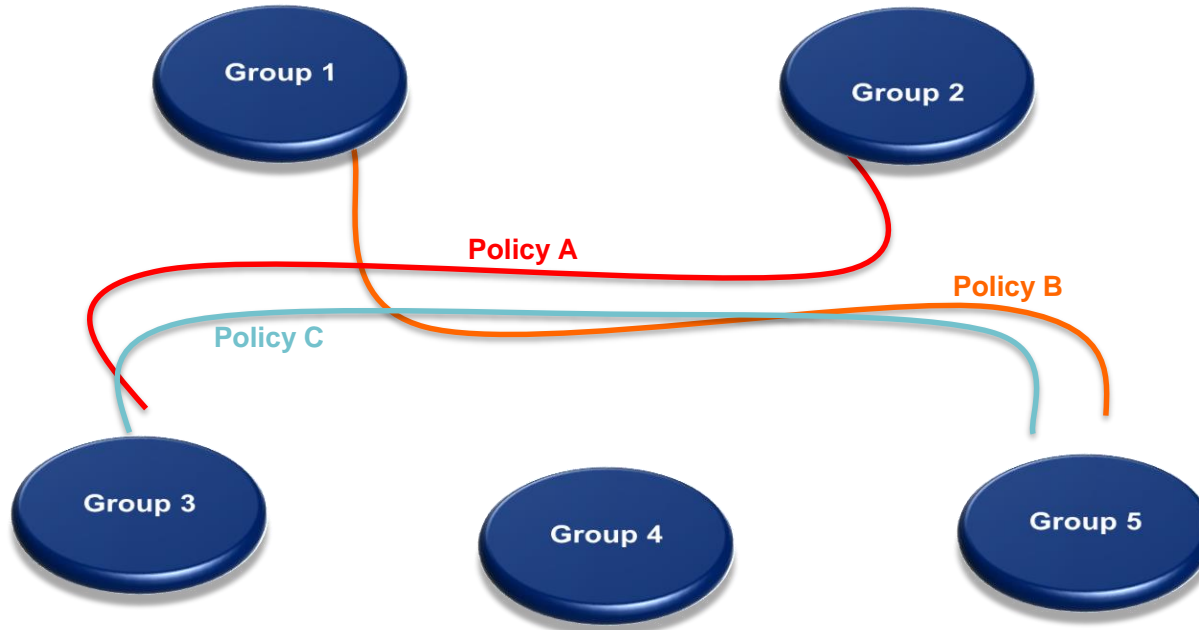
- Easy to maintain

- Basically unstoppable

What kinds of applications can go Micro-services?

- Basically ANY…

- Web ticketing or ordering system

- Online voting

- BLOCKCHAIN (e.g. HyperLedger Fabric)

- Big Data Analytics

- Distributed Apps (Unstoppable)

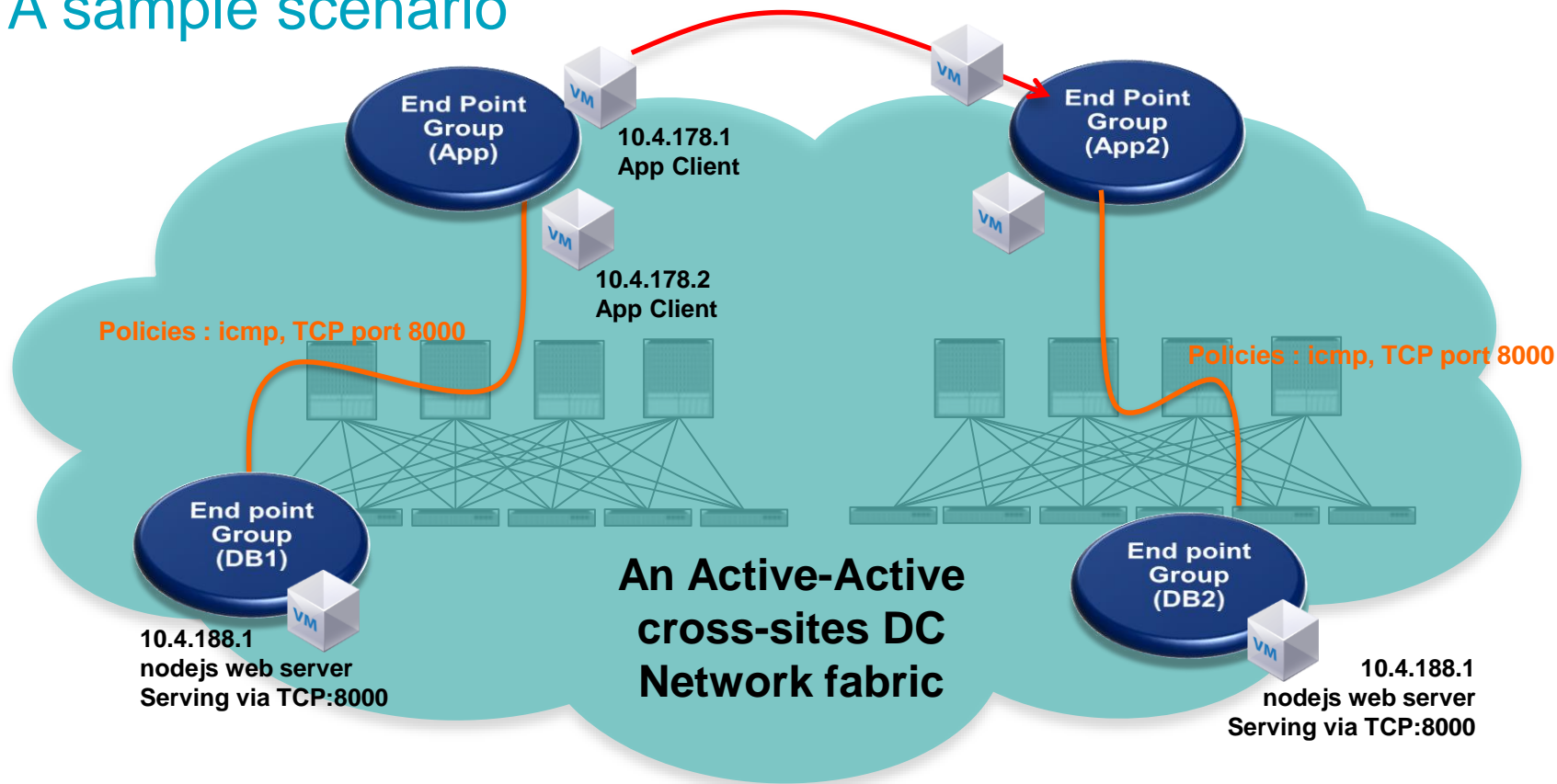# Transforming to "Server-less" without geo-boundaries

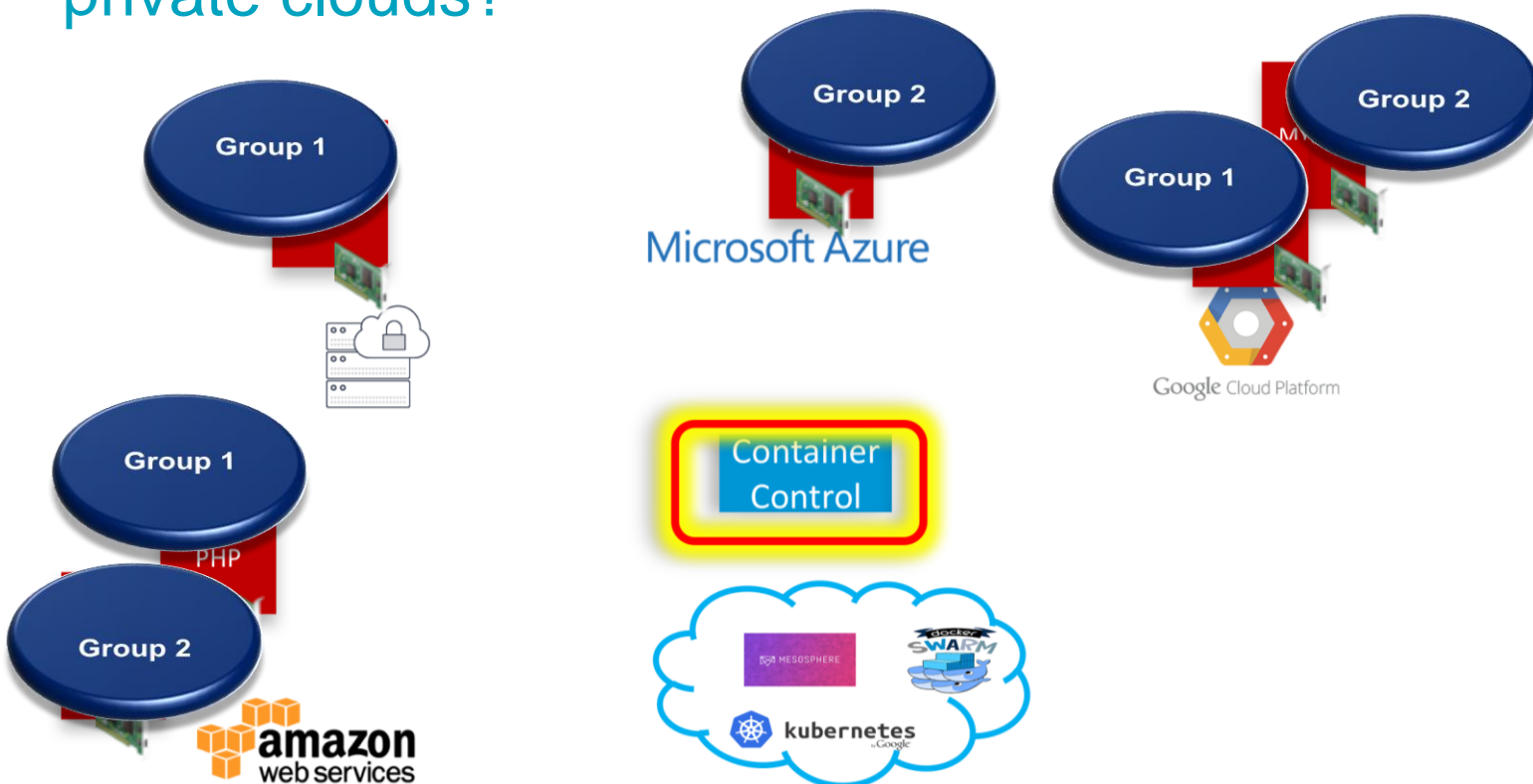# Policy-based DC Networking Model has gained traction…

Group 1

Group 2

Policy A

Policy B

Policy C

Group 3

Group 4

Group 5

App A
Group 2,3,5
Policy A
Policy C

App B
Group 1,5
Policy B

A sample scenario

End Point Group (App)

10.4.178.1
App Client

10.4.178.2
App Client

End Point Group (App2)

Policies : icmp, TCP port 8000

Policies : icmp, TCP port 8000

End point Group (DB1)

10.4.188.1
nodejs web server
Serving via TCP:8000

End point Group (DB2)

10.4.188.1
nodejs web server
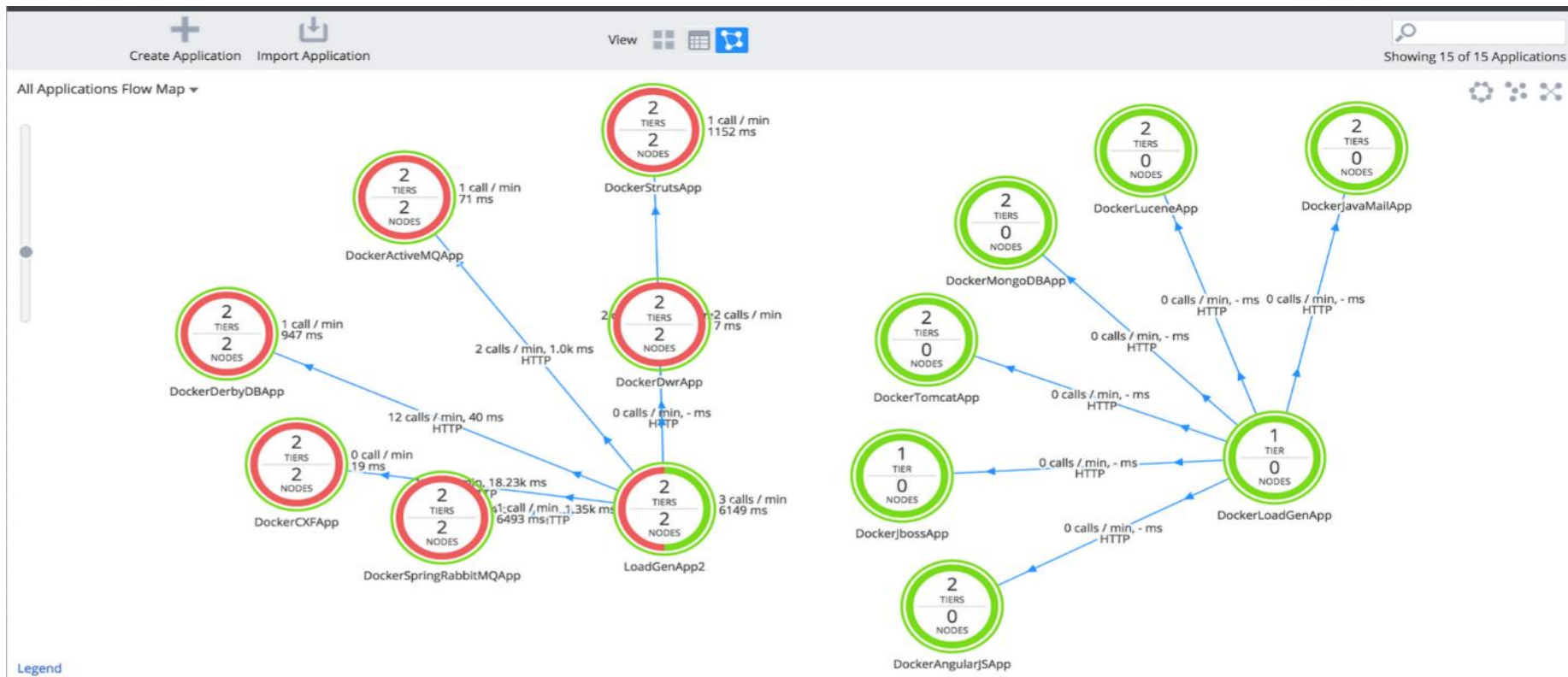Serving via TCP:8000

An Active-Active cross-sites DC Network fabric

What if such policy model can extend beyond and across private clouds?

# Operating Microservice Apps is Not Easy. Why?

Microservices Visibilities

- ML, Big Data; and Agents are inevitable

- Interaction intent
  - Permitted Traffic, Escaped Traffic, Mis-Dropped Traffic

- Be able to identify where latency is induced

- Network Latency vs Application latency

Key Use Cases for Container and Microservices

Cloud

Microservices

DevOps

Cloud Migration
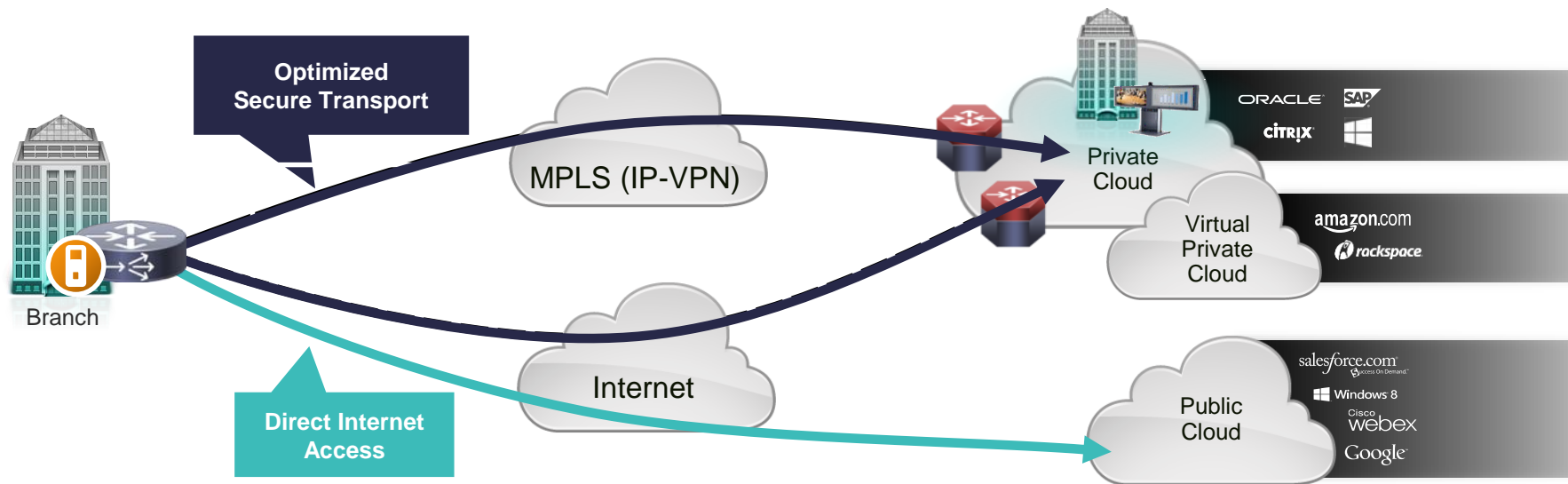
Hybrid Cloud

Multi-Cloud
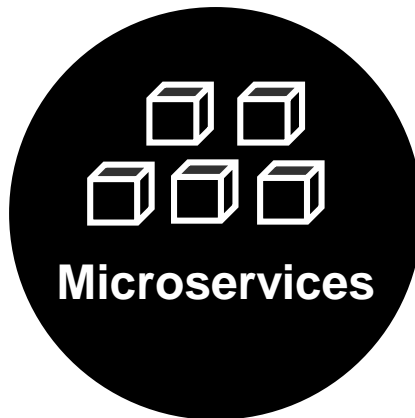
Containerization

Microservices

App Modernization

DevOps

CI/CD

Self Service

Those happen at the DC, what about the access from edges…

Software Defined WAN

Optimized Secure Transport

MPLS (IP-VPN)

Direct Internet Access

Internet

Private Cloud

ORACLE SAP
CITRIX ⊞

Virtual Private Cloud

amazon.com
rackspace

Public Cloud

salesforce.com
Access On Demand
⊞ Windows 8
Cisco webex
Google

- Increase WAN transport capacity and app performance cost effectively!

- Improve application performance (right flows to right places)

For further reading…

docker

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For Developers   For Production   For The Enterprise

A Better Way to Build Apps

Open-source container networking platform (contiv.io)

Thank you.