

The App Architecture Revolution: Microservices, Containers and Automation

Scott H. Davis
EVP of Engineering & CTO
SHD@embotics.com

Welcome!

Scott H. Davis

- Embotics EVP of Engineering & CTO
- Former VMware EUC CTO & Chief Data Center/Storage Architect
- Founder, President, CTO of Virtual Iron Software
- 17 Patents for Virtualization, Storage, Clustering, and EUC technologies
- vExpert 2015, 2016, 2017

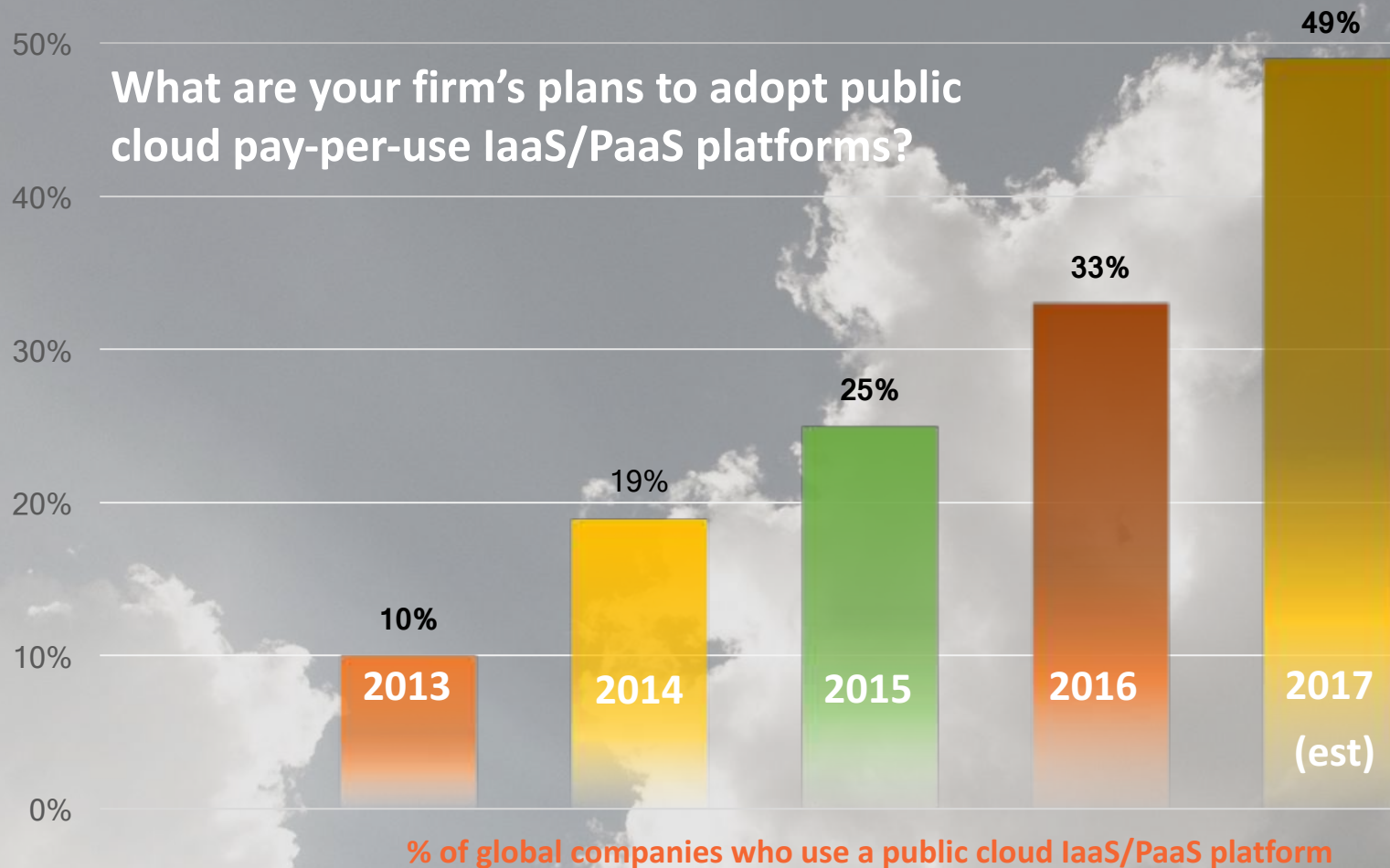


www.TalkingTechwithSHD.com



@shd_9

Public cloud adoption is in hypergrowth



Sources: Forrester's Forrsights Hardware Survey, Q3 2013 (n=1253);
Forrester's Global Business Technographics Infrastructure Surveys [2014, N=3190; 2015, N=3592; 2016, N=3503].

The 5 broad trends that will shape cloud in 2017

1. Modernization of **complex enterprise apps**

2. **Containers everywhere** shake up platform foundations

3. Serving **two masters**: cloud-native *and* digital transformers

4. Cloud Service Providers find **app, geo or industry niches**

5. **Hybrid IT is here today** and someone's got to manage it

Modernizing Complex Apps

Traditional business ops move to SaaS

- Reasons to Move to SaaS:
 - Save Costs:
 - Maintenance
 - People
 - Datacenter Facilities
 - Datacenter Hardware
 - Time
- Reasons Not to Move to SaaS:
 - Strategic Investments
 - Competitive differentiation
 - Service you sell

Containers Dominate Cloud Native Landscape

Shake up cloud platform and management strategies.



Frictionless
Application
Portability



Microservices &
Cloud Native
Synergy



Better suited than
VMs to application
building blocks &
PaaS

Serving 2 masters - “bi-modal” IT

Traditional Apps		Cloud Native Apps
Reliability	Goal	Agility
Price for performance	Value	Revenue, brand, customer experience
Waterfall	Approach	Agile
Plan-driven, approval-based	Governance	Empirical, continuous, process-based
Enterprise suppliers, long-term deals	Sourcing	Small, new vendors, short-term deals
Good at conventional process, projects	Talent	Good at new and uncertain projects
IT-centric, removed from customer	Culture	Business-centric, close to customer
Long (months)	Cycle Times	Short (days, weeks)

Think
Marathon
Runner

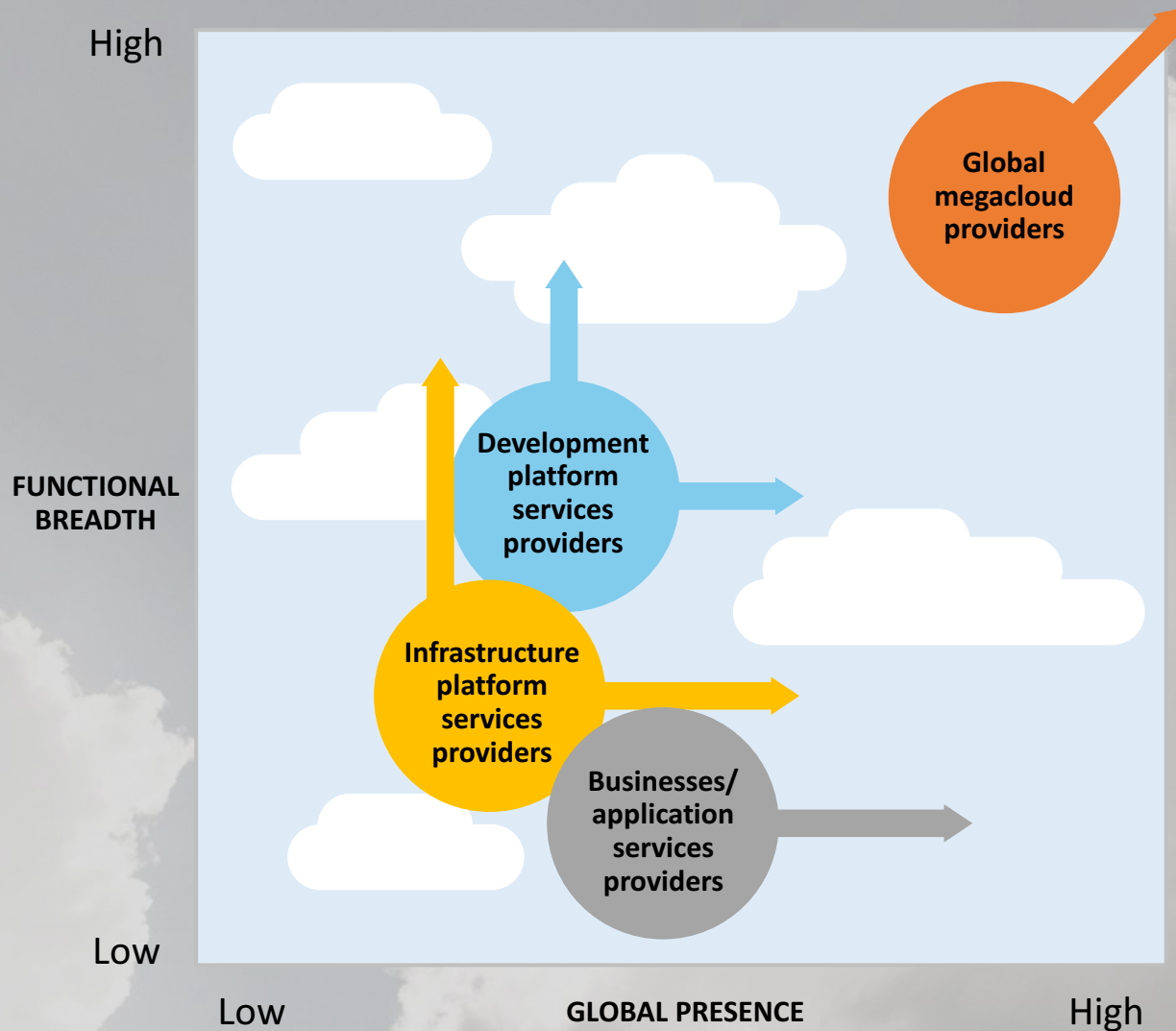


Think
Sprinter

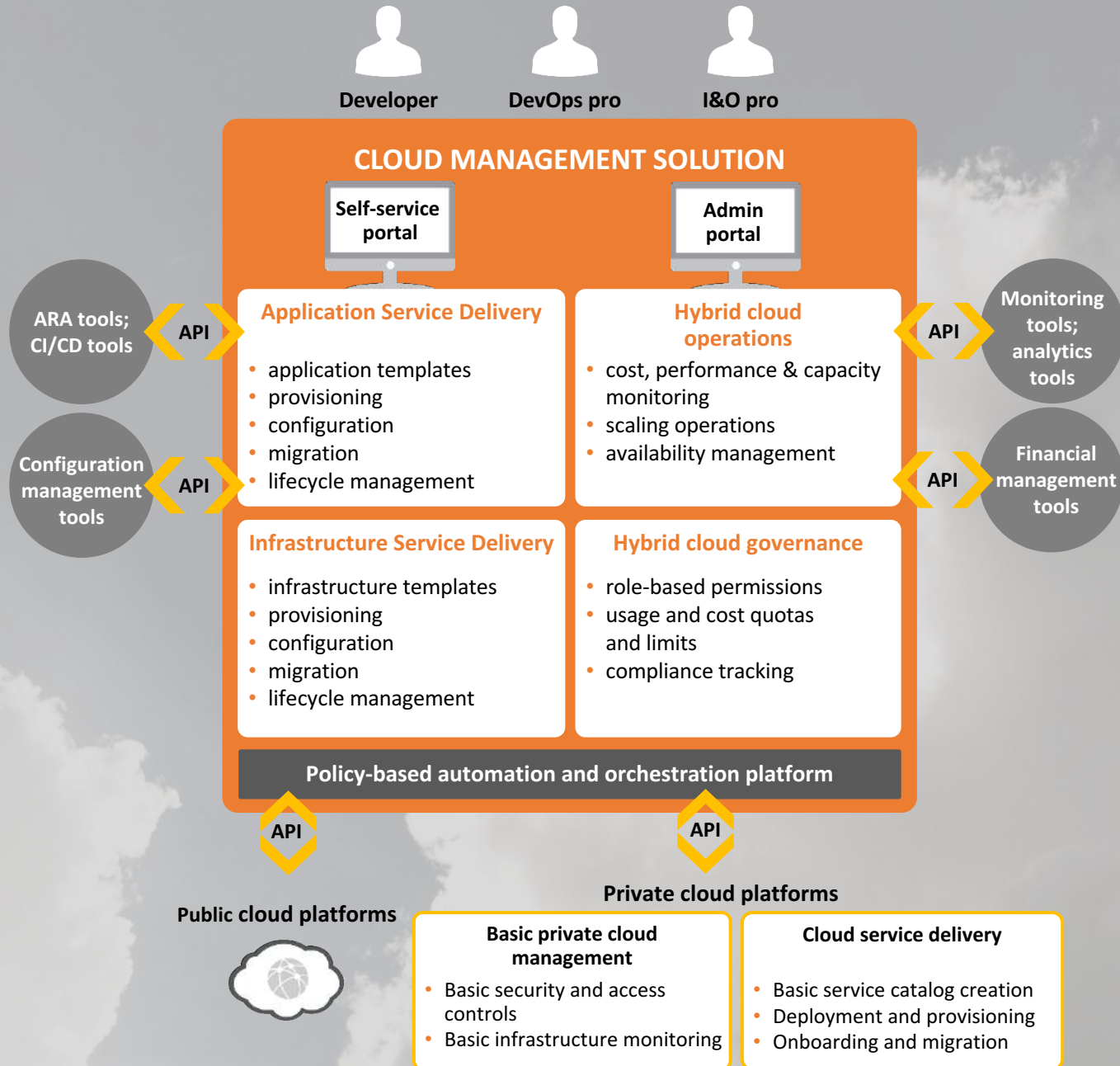


Cloud Service Provider Landscape

Differentiated Niches



Hybrid IT Management Landscape



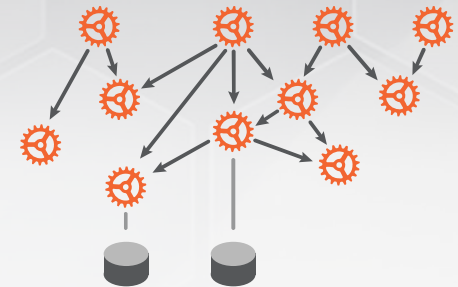
The world of applications is changing dramatically !



1990s
Pre-SOA (monolithic)
Tight Coupling



2000s
Traditional SOA
Loose Coupling

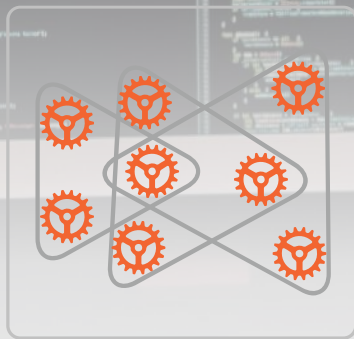


2010s
Microservices
Decoupled

Innovation & Standardization



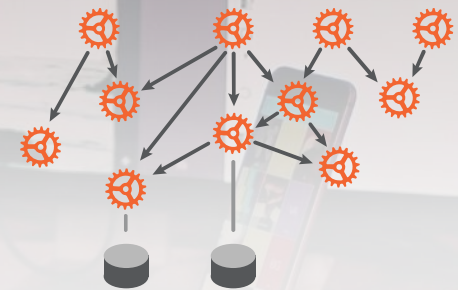
Microservices and Cloud Native Applications



1990s
Pre-SOA (monolithic)
Tight Coupling



2000s
Traditional SOA
Loose Coupling



2010s
Microservices
Decoupled



History Lesson

- Value of Virtualization

- Capex
- Business agility

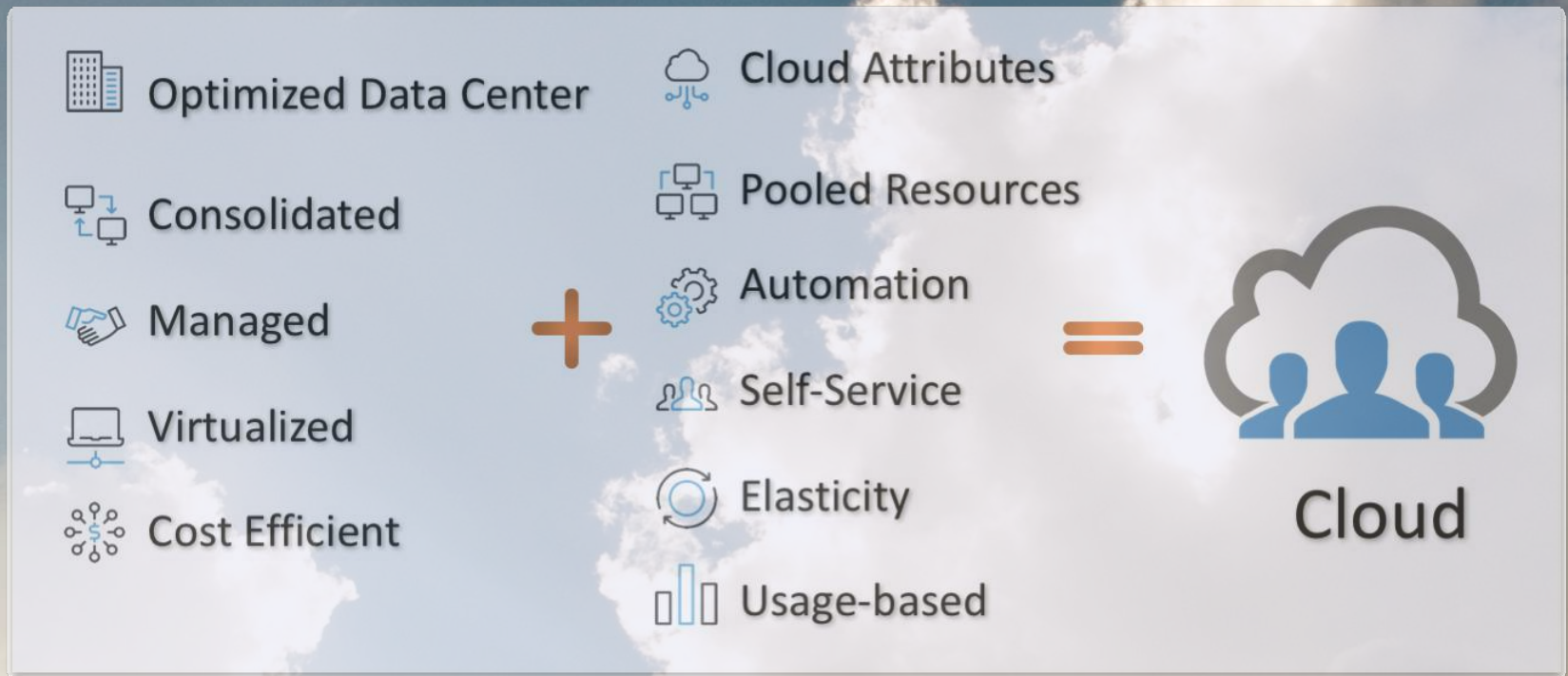
- SDDC

- Virtualize Everything

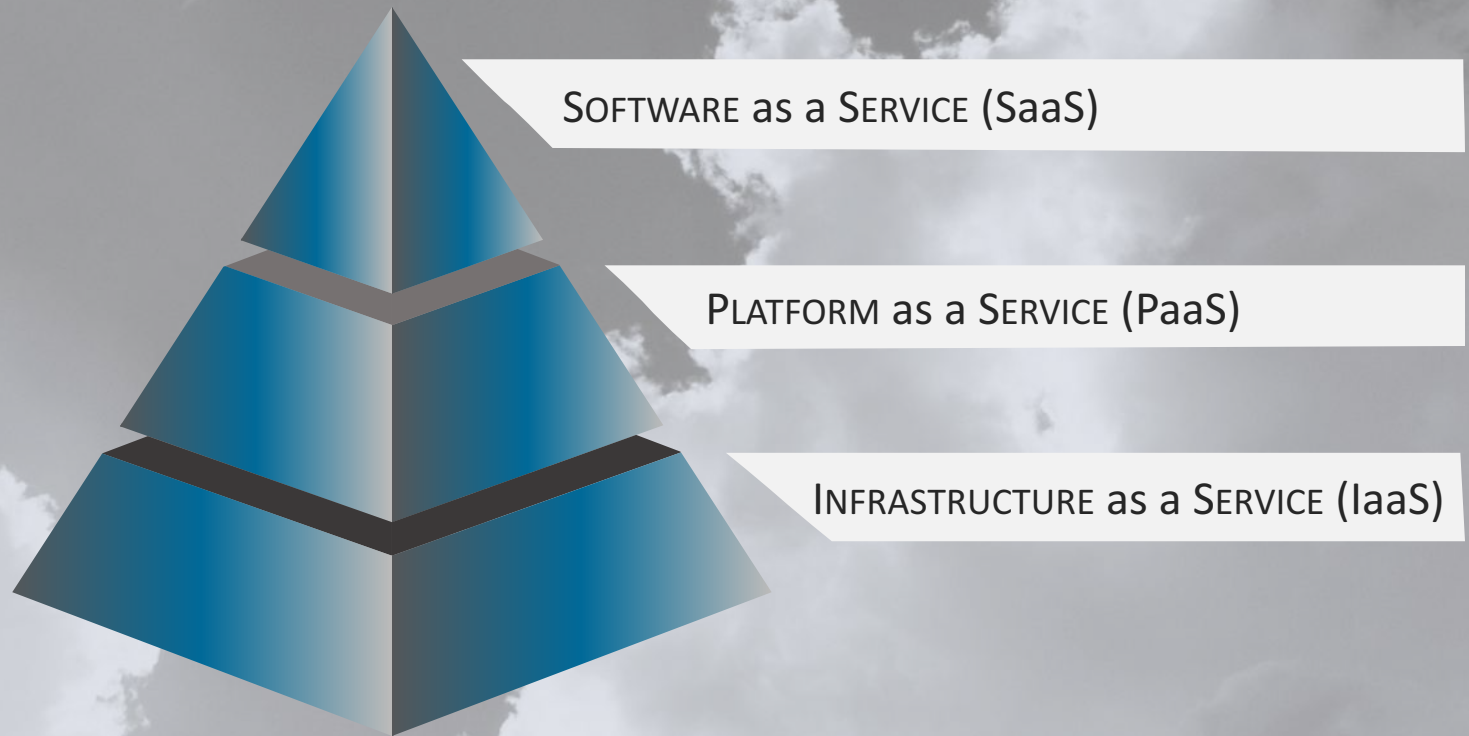
- Public Cloud

- Outsource Everything

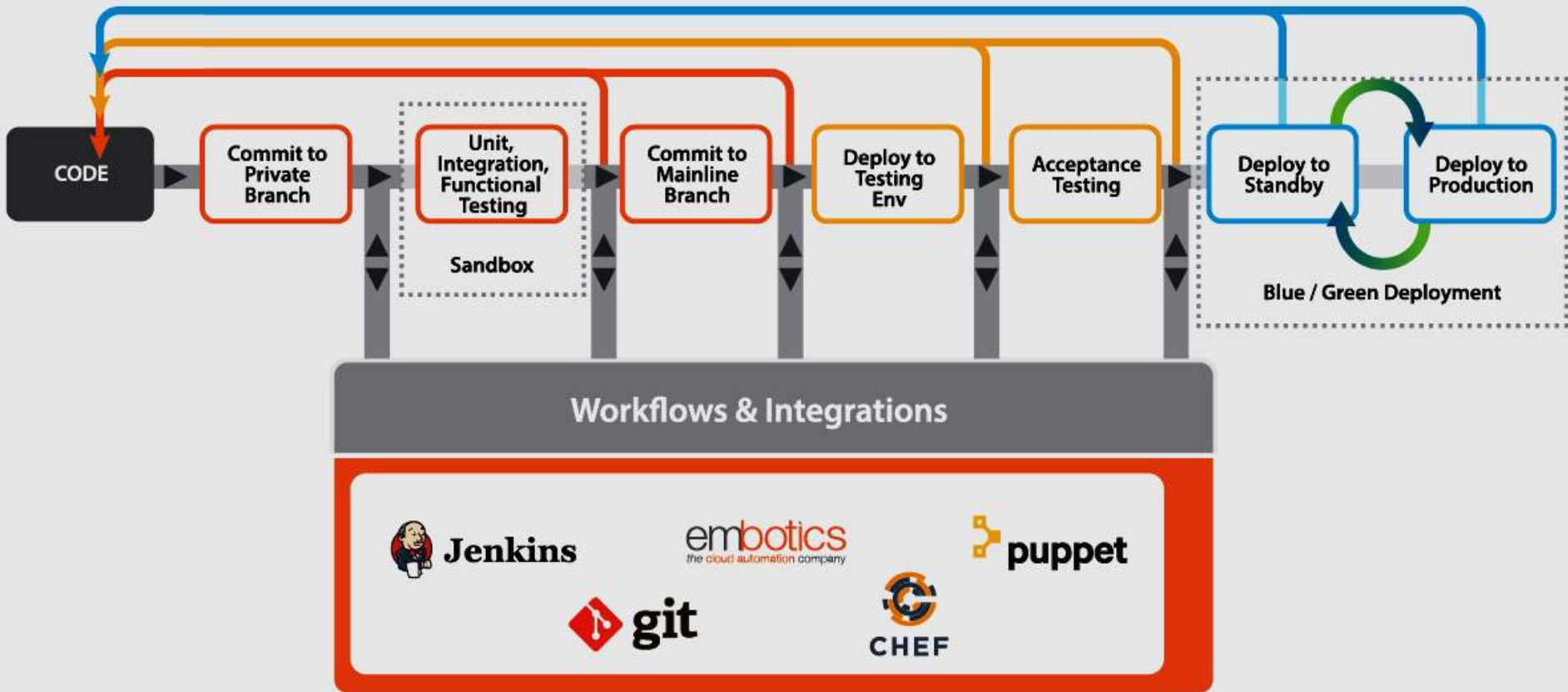
Cloud is more than virtualization



Cloud Stacks



The DevOps Pipeline



Microservices Architecture

Traditional Approach

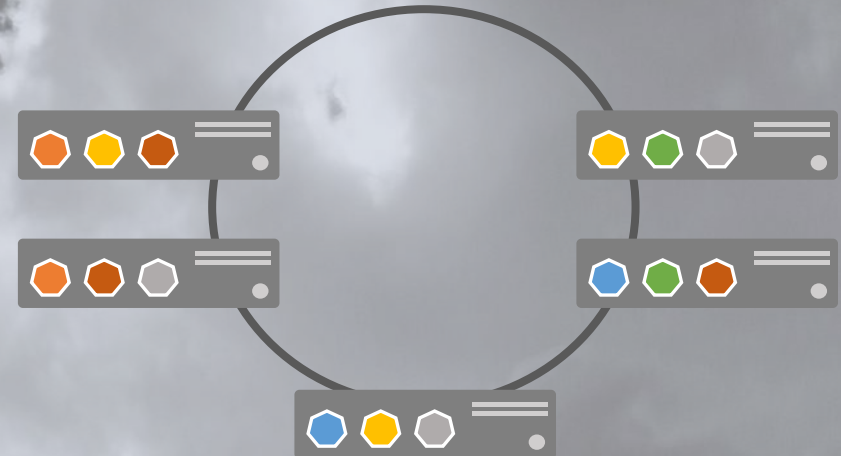
- A traditional application made up of a few monolithic components (web app or 3-tier service)
- Each component has many interrelated functions within a single process
- Scales up by re-hosting the app on larger servers/VMs



VS

Microservices Approach

- Segregates functionality into small autonomous services
- Scales out by deploying independently and replicating these services across servers/VMs/containers



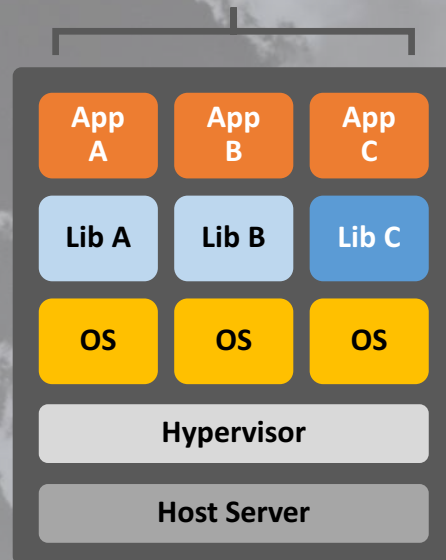
Source: Microsoft MSDN Magazine - December 2015

Microservices are symbiotic with Containers

- Enable small, self-contained teams
- Small, functional building blocks as output of development process
 - Well-managed, versioned interfaces
 - Enforced execution and data isolation
 - Immutable
- Reduce dependencies & complexity of their management

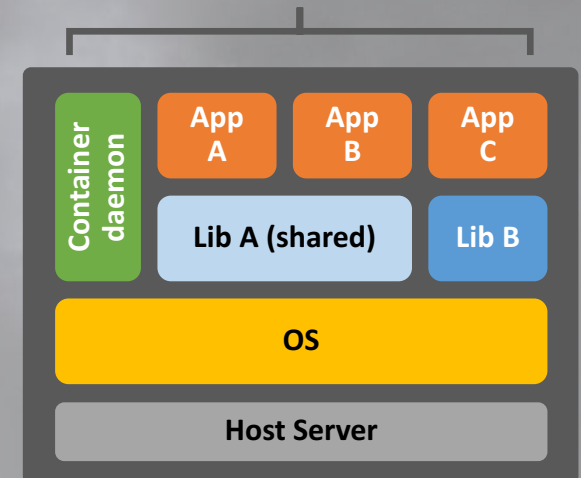
Virtual Machines

- Self-contained
- Isolated / secure
- IT/Admin.-focused



Containers

- Lightweight
- High density
- Developer-focused



Some signs you are not at Microservices level yet

- Different services do coordinated deployments
- A change in one service has unexpected consequences in other services
- Services share a persistent store
- You cannot change your service's persistent store without anyone caring
- Engineers need intimate knowledge of the design of other team's services

¹Tom Killalea "The Hidden Dividends of Microservices" ACM Queue 2016

Which brings us to... Serverless Computing

“No server is easier to manage than not having a server at all...”

— W. Vogels

- aka Function as a Service
- Ephemeral containers per API call
- Offloads container management, scaling, HA to the Cloud provider



Code



Versioning



Single-threaded
Single-task




Microseconds
to Seconds



Per Memory/Second
Per Request Free Tier

Containers & Serverless: Well suited to Microservices

Technology	Time to Deploy	Average Life Span
Physical Servers	1-3 Months	3-5 Years
Virtual Machines	Minutes to days	Weeks to Months
Containers	Milliseconds to seconds	Minutes to days
Serverless	Millisecond to seconds	Seconds

A hand is shown from the wrist up, reaching upwards with the index finger pointing towards a stylized white cloud. The cloud is positioned in the upper center of the frame. Inside the cloud, the word "embotics" is written in a sans-serif font, with "em" in black and "botics" in red. Below "embotics", the tagline "the cloud automation company" is written in a smaller, black, lowercase sans-serif font. The background is a soft-focus bokeh of colorful lights in shades of blue, green, and yellow, creating a dreamy, technological atmosphere.

embotics
the cloud automation company

Current IT Environment

Today's IT Reality

VMs, applications, changes, clouds

IT Resources

Time



[illegible]

Self-Service Portal

vCommander™ marketing@embotics.com is logged in as Superuser **embotics**

Views Configuration Tools Reports Help Home Service Requests Search Solve Logout

Self Service

[Back to Solutions Overview](#)

Service Portal

Configure Service Portal roles
Assign users and groups to Service Portal roles
Configure the Service Portal

Ownership must be assigned to VMs in order for individuals to be granted Service Portal access to their VMs

Users Currently Logged in to Service Portal:

User Id	Connected Since
llee@embotics.com	2016/04/07 10:34:40

Service Portal User Activity

Portal Activity During Last 7 Days

Logins Power ON/OFF Snapshots Open Remote Session Manage Reconfigure Resources

Service Portal User Activity View Service Portal user audit log

Ownership

Find VMs owned by

VMs without owners Find VMs that do not have ownership assigned

Service Requests

Configure Service Requests

Service Requests During Last 7 Days

New Service Requests Change Requests

Recently Completed requests
Service Requests completed in the last 7 days

Recently Rejected requests
Service Requests rejected in the last 7 days

Approved not assigned requests
Service Requests that have been approved, but not assigned

Find Service Requests that have been in this state:
 for more than

New VMs

New VMs 250 500 750 1,000 498

Time	VM Name	User
2016/04/07 10:34:33	TEST.10.18.03.592	EMBOTICSpsauton
2016/04/07 10:33:48	TEST.10.18.16.762	EMBOTICSpsauton
2016/04/07 10:06:34	jason.ig01	EMBOTICSydowler
2016/04/07 09:56:45	jason.ig01	EMBOTICSydowler

New VMs VMs created in the last 7 days

Rightsizing Recommendations



Service Catalog

Service
PORTAL

You are logged in as colin in Engineering

empowered by
embotics
vCommander™

ViewsTools

Home+Request New ServiceService RequestsSearchLogoutHelp


Services


Filter


21 unfiltered rows


12


Page 1 of 2



Apache
\$525



AWS Ruby on Rails Dev Env.
\$375



AWS S3 Website (Requires a R
\$125



AWS Simple LAMP Stack
\$125



Development Environment
\$510



HighJump
\$990



Linux
\$324


Linux w Puppet
\$355


SQL Server
\$525


Test
\$843


Ubuntu
\$170

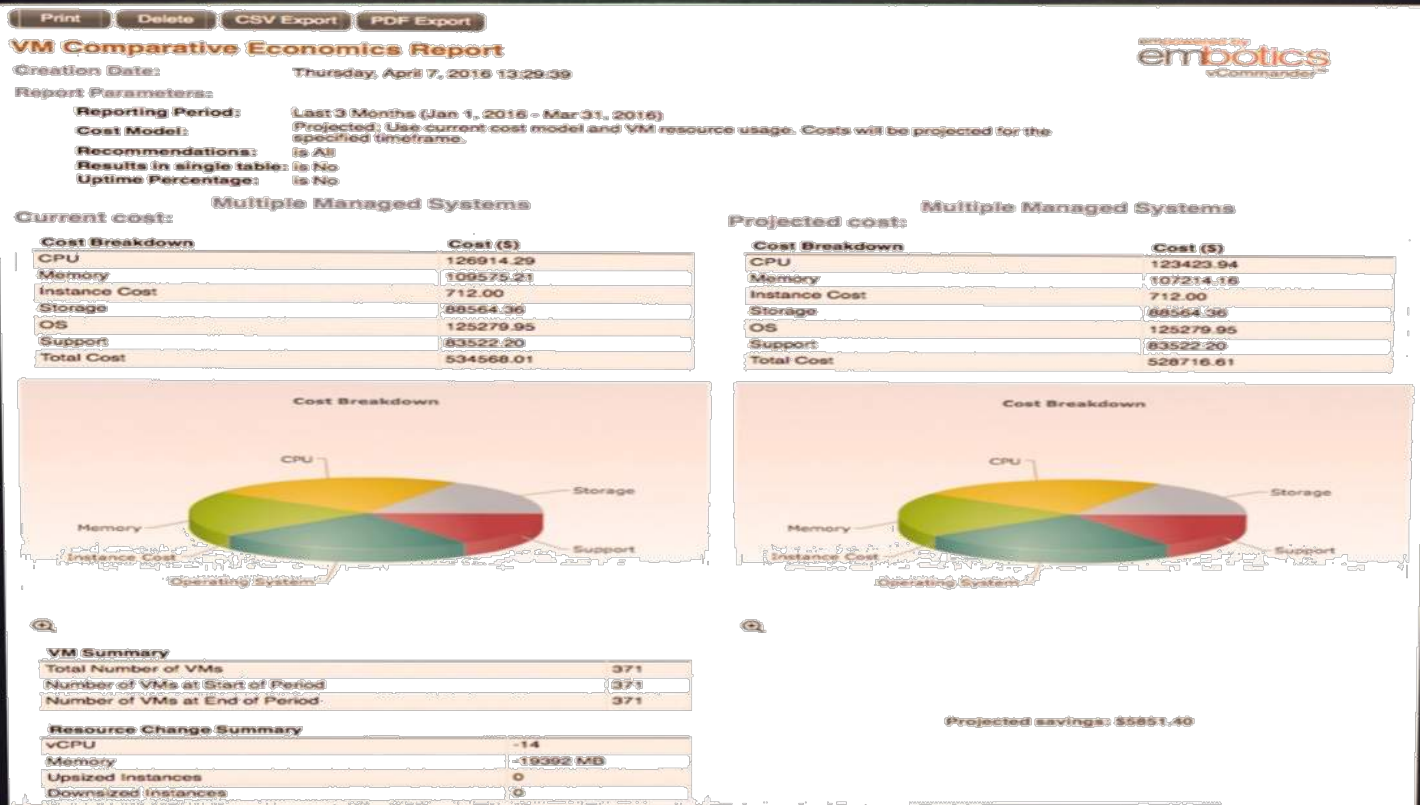

Ubuntu Development
\$411

Request

Service	Qty	Cost
AWS Ruby on Rails Dev Env.	1	\$375
AWS Simple LAMP Stack	1	\$125
Estimated Quarterly Cost :		\$500

HelpSubmit RequestCancel

Comparative Costing Reports





NORDSTROM



careerbuilder®

Bell



SUNGARD®



fiserv.

SMART



JABIL



ROPES & GRAY



Embotics vCommander – Product Capabilities



Multi-cloud and multi-hypervisor management



Complexity free installation and configuration



Provisioning automation and orchestration



Infrastructure cost visibility - Chargeback / Showback



Economic comparisons & intelligent placement



Extensive out-of-the-box reporting & analytics



End-user IT self-service portal delivery



Resource planning and rightsizing analysis

VM Comparative Economics Report

Creation Date: Thursday, April 7, 2016 13:29:39

Report Parameters:

Reporting Period: Last 3 Months (Jan 1, 2016 - Mar 31, 2016)

Cost Model: Projected; Use current cost model and VM resource usage. Costs will be projected for the specified timeframe.

Recommendations: Is All

Results in single table: Is No

Uptime Percentage: Is No

Current cost: Multiple Managed Systems

Cost Breakdown

	Cost (\$)
CPU	126914.29
Memory	109675.21
Storage	712.00
Instance	9564.36
OS	52779.95
Support	83522.20
Total Cost	534568.01

Projected cost: Multiple Managed Systems

Cost Breakdown

	Cost (\$)
CPU	126914.29
Memory	109675.21
Storage	712.00
Instance	9564.36
OS	52779.95
Support	83522.20
Total Cost	528716.61

VM Summary

Number of VMs	371
Number of VMs in state of 'on'	371
Number of VMs in state of 'off'	371
Memory	-14
Memory	-19392 MB
Upsized Instances	0
Downsized Instances	0



Overlays seamlessly across your
existing infrastructure

The lasting value of the cloud



Q & A