Private Cloud Management

Speaker
Systems Engineer
Unified Data Center & Cloud Team Germany

Juni 2016
Agenda

• Cisco Enterprise Cloud Suite
• Two Speeds of Applications
• DevOps – Starting Point into PaaS
• Cloud Management Focus - Mode 2
Enterprise Cloud Suite
Changing Customer Expectations

**Speed**
IT Services Delivered in Minutes, Not Days or Weeks

**Open**
Portability and Interoperability Across Diverse Technologies

**Self Service**
Control Shifting to the Customer
IT Challenges in Datacenter

Manual

- OPERATIONS MANAGER
- CHANGE MANAGER

Siloed

- NETWORK ADMIN
- VIRTUALIZATION ADMIN

Ticket Based

- SERVER ADMIN
- STORAGE ADMIN

7 weeks, 136 service tickets
Capabilities Needed to build Private Clouds

**INFRASTRUCTURE AUTOMATION**
Remove error-prone manual process and silos

**SECURE APP SEGMENTATION**
Policy based deployment and isolation of application tiers and tenants

**SELF-SERVICE USER EXPERIENCE**
Empowers developers and IT to order and manage lifecycle of applications

**HYBRID EXTENSION**
Secure data center extension into public cloud
Cisco ONE Enterprise Cloud Suite
Comprehensive Cloud Automation for Hybrid IT

End User/Developer or Consumer

IT App Designer

Infrastructure Admin

Extensible with 3rd Party Integration

IT Catalog (PSC, Service-now, Remedy etc.)

Application-centric Private and Hybrid Mgmt, Cloud Center(CliQr)
Applications | Policies | DevOps | Services

Policy Driven Datacenter Infrastructure Automation (UCSD)
Heterogeneous IT | Policies | Orchestration | Segmentation | Services | ACI (VACS) (ICF)

UCS Integrated Infrastructure
UCS Management
Compute | Network | Storage | Multi-site | DC Virtualization

Public Clouds

Private Clouds

Ecosystem of Service Providers

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Comprehensive Cloud Automation for Hybrid IT

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Public Clouds

Private Clouds

Ecosystem of Service Providers
Multi Cloud Management Platform
Cisco CloudCenter

Business (ITSM)
Prime Service Catalog, ServiceNow, Custom

Development (DevOps)
CliQr, Jenkins

Application-Centric Lifecycle Management
Model - Benchmark
Deploy - Manage

Application Profiles

Datacenter
UCS Director
ACI
UCS, Storage, Nexus Switching

Private Cloud
Public Cloud

VMware, Azure Pack, Hyper-V
openstack, MetaPod
SoftLayer, Azure Government
Two Speed of Applications
Data Center Exists for Data and Applications

Traditional vs Cloud-Scale

Traditional Systems of Record

- Getting IT Right
  - Efficient
  - Stable
  - Resilient

Cloud-Scale Systems of Engagement

- Getting IT Fast
  - Agile / TTM / BU focused
  - Experimental
  - Rapid Application Evolution
Data Center Stack Evolution

Virtualized / Cloud Stack (2003–Today)
- Workloads
- Configuration Management
- Orchestration and Mgmt
- Virtual Machine
  - ‘vApps’
  - Operating System
- Hypervisor
- Compute, Network, Storage

Cloud Native, Container Stack (Now)
- APIs - Microservices
- Workflow / Management
- Cluster Managers
- Container
  - ‘containerized Apps’
- HDFS
- Lightweight Linux
- Scale Out Infra
# Cisco Infrastructure Stacks

## Type of Workloads

- Bare Metal / Virtual
- Cloud-Enabled
- Cloud-Native

## Cisco Hybrid Cloud Orchestration & Management

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<th>Traditional / Converged</th>
<th>Hyper Converged Infrastructure</th>
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<th>Streaming Data &amp; Analytics</th>
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DevOps

Starting Point into PaaS
Why does it matter?

Business Agility due to faster application development and deployment

Traditional “Water fall” deployment workflow

Agiler deployment workflow (CI/CD)
(not necessarily Microservices, that’s software architecture)
PaaS != Containers and Microservices

Your code
Your startup scripts
Code Dependencies

Container

Should deploy with exactly the same behavior on any Host/VM that can run containers.

Microservice

Orders
Wishlist
Payment
The Power of a Platform

Traditional IT
- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

IaaS
- You Manage
- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Platform
- You Manage
- Applications
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Cloud Enablement

Agility and Cost Savings
Cisco Platform as a Service Solutions

**Cisco Container Stack**
- Container Management with K8S or MESOS
- Infrastructure affinity through Contiv
- OpenSource Project

**Eco Partnerships PaaS**
- Legacy Application and .Net Support with Apprenda
- Cloud Native Development with Apprenda

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Cisco Strategy - Container and Microservice

- Fully functional, portable, container-based service at the push of a button
- Deploys apps consistently across internal/private, public, or hybrid IT and cloud environments
- No lock-in

- Open source project defining infrastructure operational policies for container-based application deployment
Datacenter and solution today

- Configuration and management of separate clusters
- Resources provisioned independently for each cluster
- Need to move data between clusters for each service
Shared Cluster

- Security
- Service Discovery & Linking
- Logging and Monitoring
- Deployment Orchestration

AWS/Metapod/UCS...

- MESOS
- VM1
- VM2
- VM3
- VM4
- VM5

- docker
- StreamSets
- cassandra
- elasticsearch
- kafka
- Spark
- HDFS
Architecture

SUPPORT APPS
Marathon
Vault
Docker
mesos-consul
marathon-consul

INFRASTRUCTURE SERVICES
Consul
collectd
ELK stack
Monitoring

CLUSTER MANAGEMENT & SCHEDULING
Mesos & Kubernetes

PROVISIONING OF VMs
Terraform
Mantl.io – Consists of… Terraform

• Infrastructure as Code

• Execution Plans

• Resource Graph

• Change Automation
Architecture

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CLUSTER MANAGEMENT & SCHEDULING
Mesos & Kubernetes

PROVISIONING OF VMs
Terraform
Mantl.io – Consists of… Mesos

- Distributed Systems Kernel
- Scaling across entire DC
- Scalability up to 10,000 nodes
- Multi-resource scheduling
Mantl.io – Consists of... Consul

- Service Discovery
- Health Checking
- Key/Value Store
- Multi Datacenter
Architecture

**SUPPORT APPS**
- Marathon
- Vault
- Docker
  - mesos-consul
  - marathon-consul

**INFRASTRUCTURE SERVICES**
- Consul
- collectd
- ELK stack
- Monitoring

**CLUSTER MANAGEMENT & SCHEDULING**
- Mesos & Kubernetes

**PROVISIONING OF VMs**
- Terraform
Mantl.io – Consists of… Marathon

- Container orchestration platform for Mesos and DCOS
- Multiple container Runtimes
- High Availability
- Constraints
- Load Balancing
Mantl.io – Consists of... many many more!
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Where does Contiv Fit in the Stack?

DevOps
SysAdmin

Ops Orchestration/PaaS (Provides Roles/Multi-tenancy/Visibility/GUI), Contiv Plugins

Container Cluster Scheduler | Contiv Cluster-wide Intent Manager

Container Runtime (Docker, etc.)
Contiv Networking/Volume Agents

Container Optimized OS

Optimized Infrastructure/ Cisco Integrated Infrastructure
Cisco Hardware: UCS Compute, Nexus 9k, ACI

Host-1

Host-n
ACI Policy Extended to Docker Containers
Project Contiv Offers Open Source Docker Integration for APIC

**Project Contiv**
- Open source project for defining operational policies for container deployment
- Includes Docker networking plugin and APIC API integration

**Solution Highlights**
- ACI policies can be extended across physical, virtual machines, and Docker containers
- Open source Project Contiv can be used to integrate Docker containers with ACI
Vernetzen.
Gestalten.
Werte schaffen.
Mit Sicherheit!