



**3S**

**TECHNOLOGY  
CITY**

# **Les architectures du cloud Computing, enjeu stratégique pour l'entreprise**

**3S**

Standard Sharing Software

**Ehsen Zayen**  
Dir. Delivery (3S)

# Who am I?



- IT Systems Engineer (3S)
- Datacenter & virtualization Specialist
- Linux & Open Source enthusiast
- Cloud computing evangelist





# What?





# Everyone is talking about cloud computing!

## What is it

## Let's google it





"cloud computing"



Web

News

Books

Images

Videos

More ▾

Search tools

About 113,000,000 results (0.43 seconds)

**Cloud computing - Wikipedia, the free encyclopedia**

[en.wikipedia.org/wiki/Cloud\\_computing](https://en.wikipedia.org/wiki/Cloud_computing) ▾ Wikipedia ▾

**Cloud computing** allows application software to be operated using internet-enabled devices. Clouds can be classified as public, private, and hybrid.

**Capital expenditure - Category:Cloud platforms - Cloud computing providers**

You visited this page on 5/20/15.



Oxymoron





... a model for enabling **ubiquitous**, convenient, **on-demand** network access to a **shared pool** of **CONFIGURABLE** computing resources (e.g., networks, servers, storage, applications and services) that can be **rapidly provisioned and released** with minimal management effort or service provider interaction.



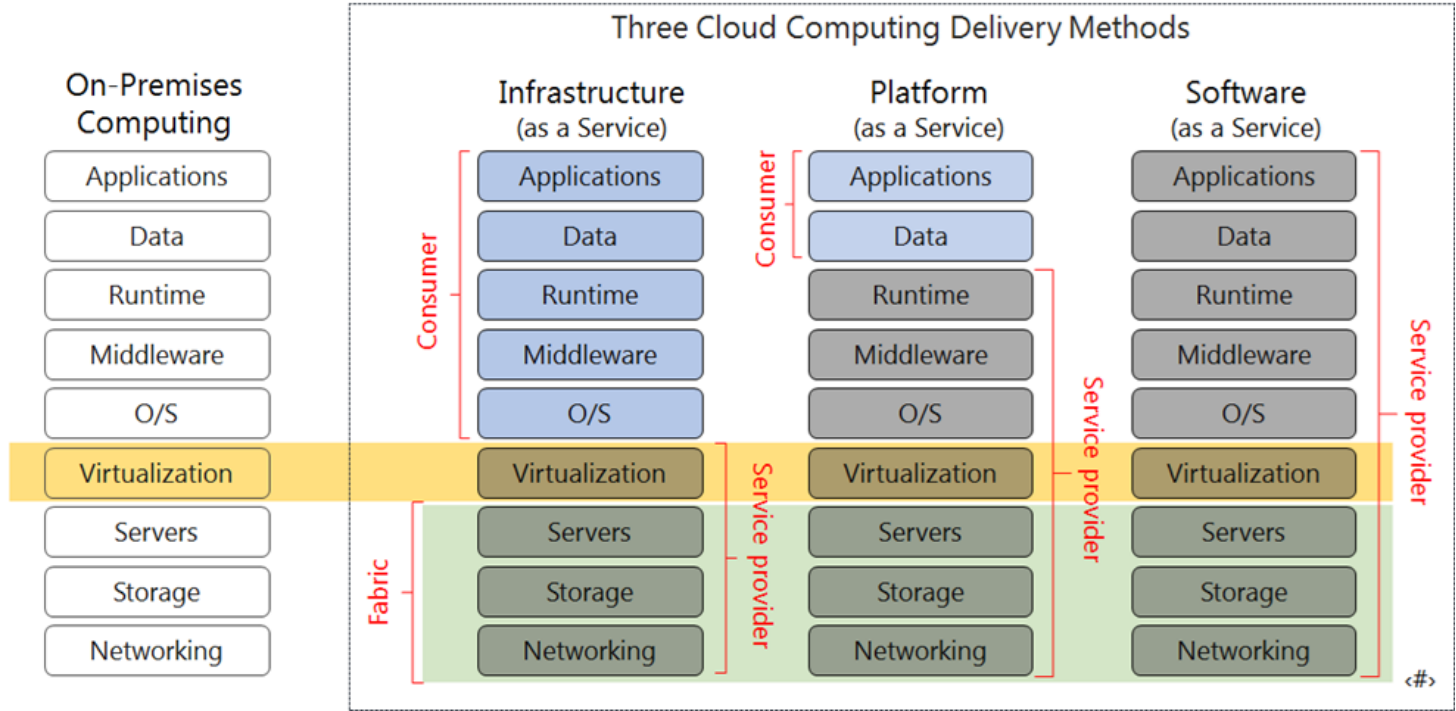
# Main characteristics



- Ubiquitous
- On demand
- Shared pool
- Configurable computing resources
- Rapidly provisioned and released



# Cloud Computing Service Models





# From Virtualization to Orchestration : the Path to the Cloud



- **Virtualization.**
  - The underpinning for the majority of clouds is a virtualized infrastructure.
  - Used to pool infrastructure resources
  - provides the basic building blocks for your cloud environment to enhance agility and flexibility.
- **Automation.**
  - to reduce manual processes via automation.
  - capabilities to provision, monitor, and report.
  - faster access to users and increases IT productivity for routine tasks.
- **Orchestration.**
  - enable policy-driven workload management and movements,
  - deliver capabilities for self-service and metering.
  - required for deploying software-defined networking, storage and infrastructure (SDN, SDS) and network function virtualization (NFV).
  - greater efficiency, agility, and security.





# Why?



# Automation benefits



EFFICIENCY



SPEED



DIGITAL  
DISRUPTION



IT COST REDUCTION

77%



ABILITY TO MEET SLAS

72%



TIME TO PROVISION  
IT SERVICES

99%



STRATEGIC ALLOCATION  
OF IT BUDGET

200%



REVENUE GROWTH

10%

Source: IDC InfoBrief, sponsored by Cisco, Don't Get Left Behind: The Business Benefits of Achieving Greater Cloud Adoption, Aug 2015.





# How?



# Building a Cloud



Self-Service Catalog & Portal



Orchestration and Automation

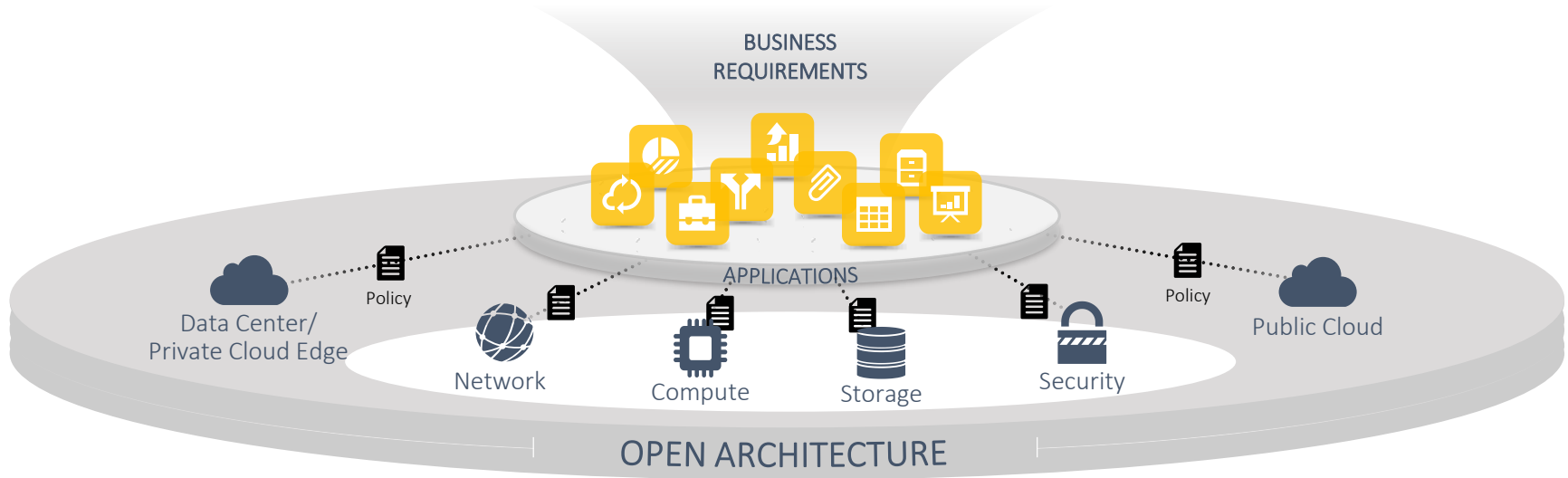


Infrastructure Management

Physical / Virtual



# Cisco Policy Driven Integrated Infrastructure



# Policy: Links Application Language to Infrastructure



## Application Language

- Application tier policy and dependencies
- Security requirements
- Service level agreement
- Application performance
- Compliance
- Geo dependencies



## Policy-Driven Infrastructure



Network Language



Compute/Storage  
Language



Security Language



# Cisco Data Center



## POLICY-DRIVEN DATA CENTER



### Edge Ready

Bring Your Data Center Closer to  
IoE/IoT, Remote Branches with  
Distributed Analytics



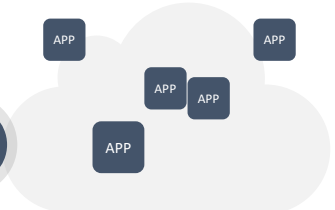
### Optimized for Efficiency and Speed

Automated | Simple | Secure



### Intercloud Ready

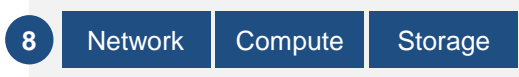
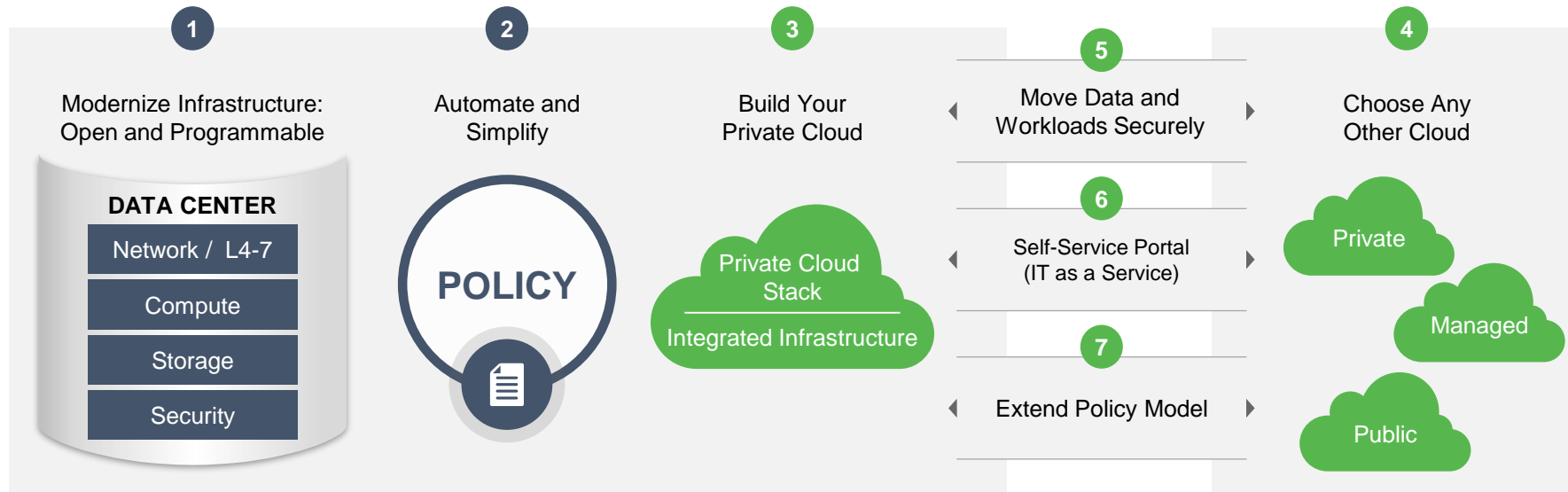
Get Secure Workload Mobility  
with Any Cloud



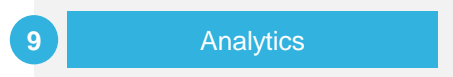
Accelerate Digital Transformation



# Policy Driven Integrated Infrastructure In Action



Deploy Edge with consistent policy and management as DC



Integrate Analytics Across Data Center and Edge

## SECURITY

**10**



# Data Center and Cloud Portfolio



SOFTWARE



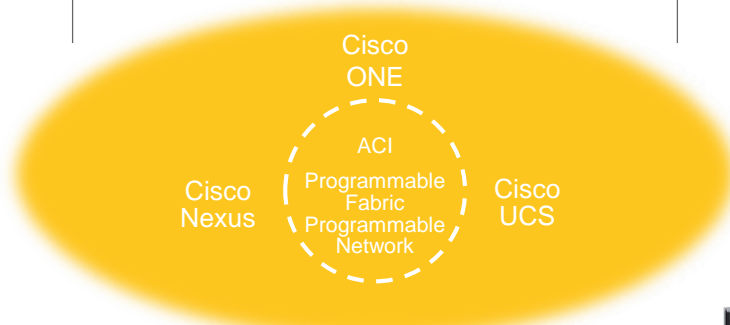
**Infrastructure Management**  
Eg. UCS Director—Policy Based  
Orchestration for Integrated  
Infrastructure



**Cisco ONE Enterprise Cloud Suite**  
Private Cloud Solutions



**Cloud and Systems Management**  
Eg. Application Policy Infrastructure Controller  
(APIC) for ACI



INFRASTRUCTURE



**Cisco Security Solutions**  
Physical /Virtual ASA with  
FirePOWER



**Nexus Switching**  
Physical and Virtual  
Switches for LAN/SAN  
Nexus 1000V—Nexus 9000  
on NX-OS



**UCS Integrated Infrastructure**  
Private Cloud Building Blocks  
UCS, Nexus



**UCS and UCS Manager**  
Compute, Network and  
Storage Access  
B-Series, M-Series,  
UCS Mini



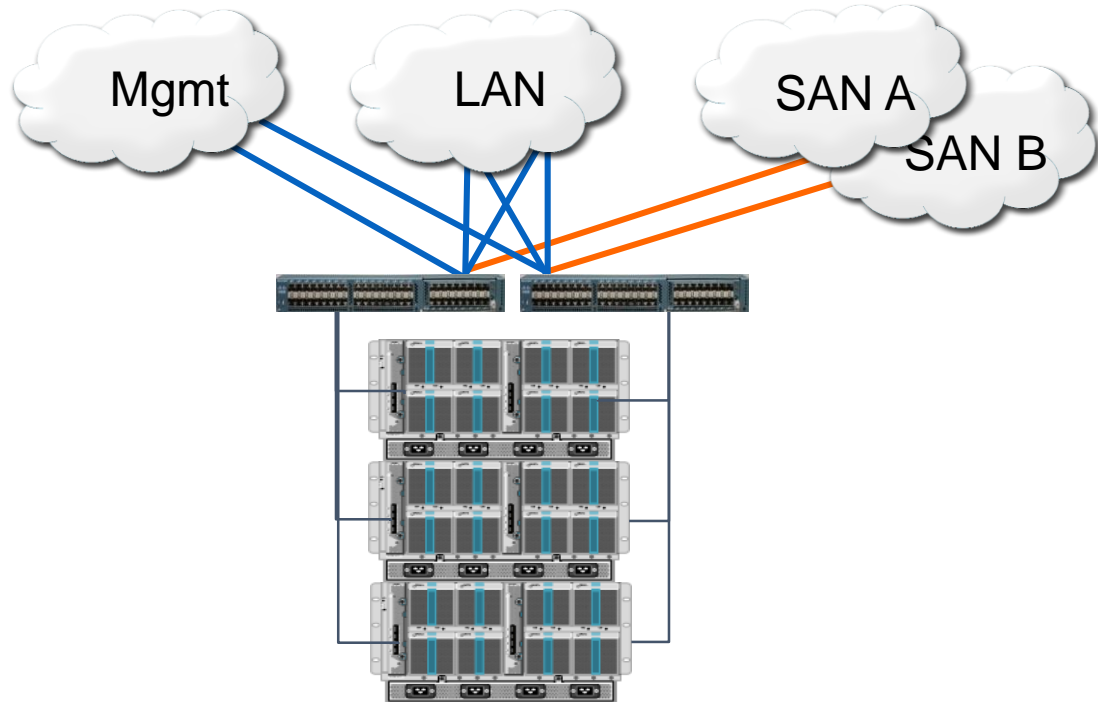
**MDS Solutions**  
Storage Networking  
on NX-OS  
MDS 9200—MDS 9700



# Unified Computing System



- Embed management
  - Remove unnecessary
    - Switches
    - Adapters
    - Management Modules
- Unify fabrics
- Power & Cooling
  - Less than 1/3rd the support infrastructure
  - 63% open design
  - Low power components
- Optimize virtualization
  - VIC 256 PCIe devices



# Elements of UCS



## UCS Manager

Embedded– manages entire system



## UCS Fabric Interconnect

48 Port 10Gb FCoE

96 FY 2012



## UCS Fabric Extender

Remote line card

4 or 8 port 10 Gb FCoE



## UCS Blade Server Chassis

Flexible bay configurations



## UCS Blade Server

Industry-standard architecture



## UCS Adapters

Choice of multiple adapters



# Stateless Computing: UCS Service Profiles



- RAID settings
- Disk scrub actions

- Number of vHBAs
- HBA WWN assignments
- FC Boot Parameters
- HBA firmware

- FC Fabric assignments for HBAs

- QoS settings
- Border port assignment per vNIC
- NIC Transmit/Receive Rate Limiting

- VLAN assignments for NICs
- VLAN tagging config for NICs

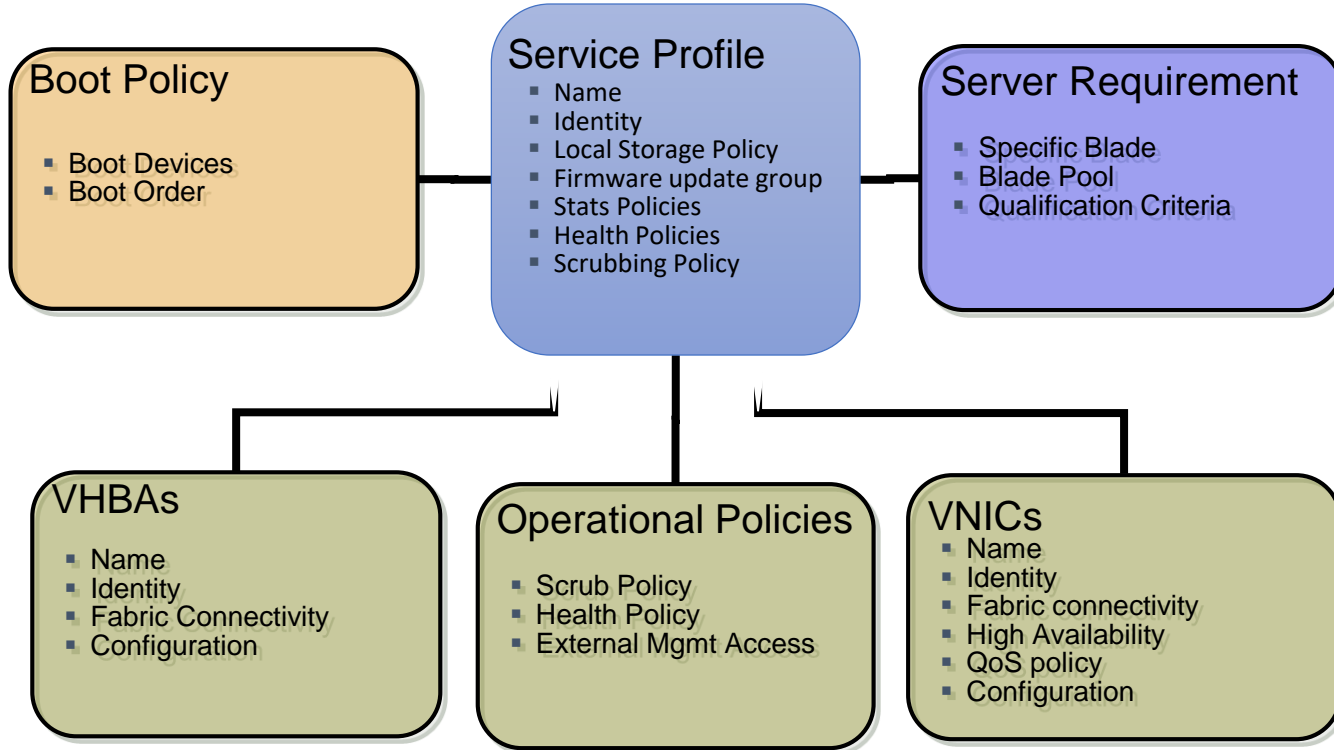
- Number of vNICs
- PXE settings\
- NIC firmware
- Advanced feature settings

- Remote KVM IP settings
- Call Home behavior
- Remote KVM firmware

- Server UUID
- Serial over LAN settings
- Boot order
- IPMI settings
- BIOS scrub actions
- BIOS firmware
- BIOS Settings



# Service Profile Components



# Cisco ACI : programmable network



## APPLICATION-CENTRIC INFRASTRUCTURE

NEXUS  
9000 SERIES



APPLICATION POLICY  
INFRASTRUCTURE  
CONTROLLER



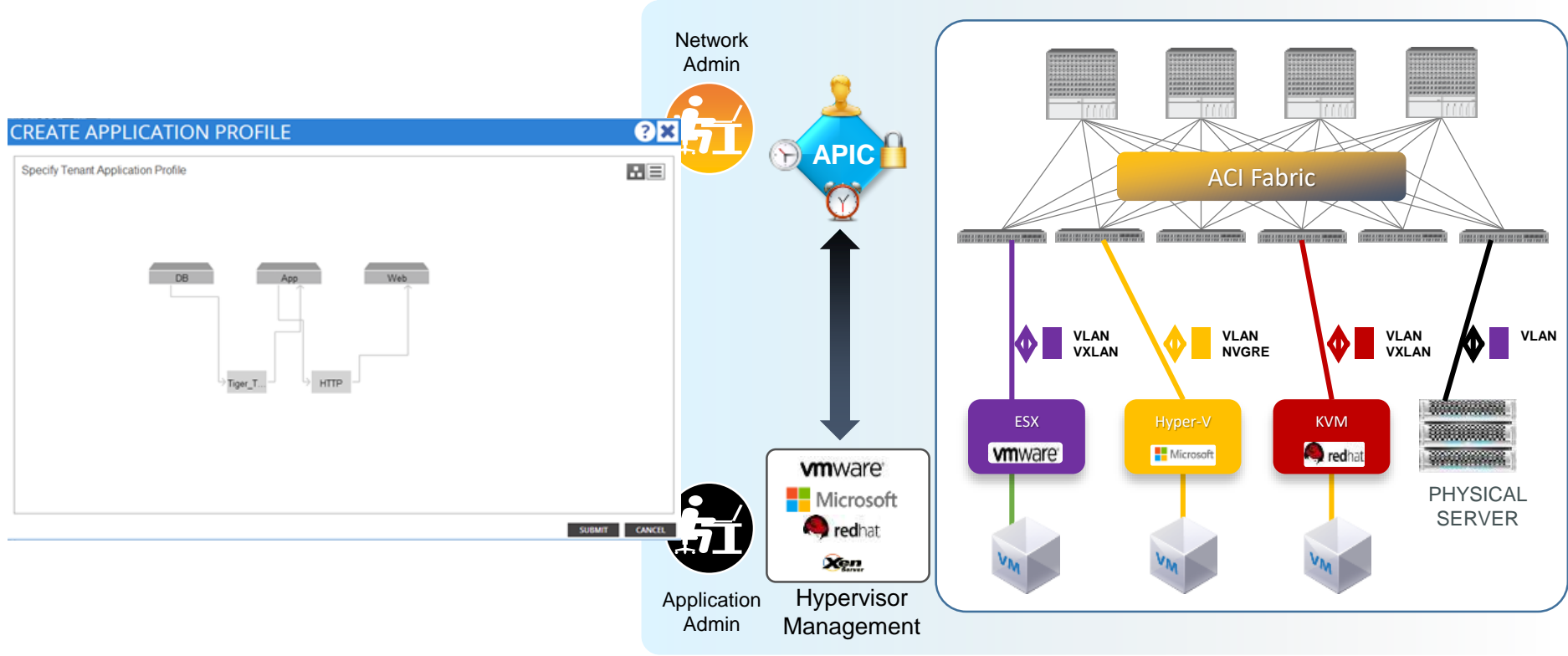
INDUSTRY LEADING  
ECOSYSTEM



OPEN STANDARDS OPEN SOURCE

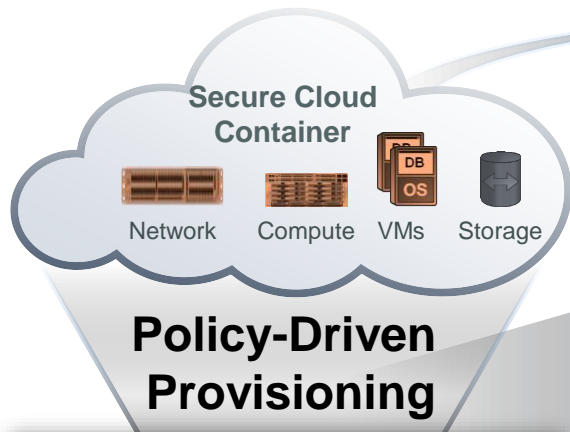


# Multi-Hypervisor-Ready Fabric





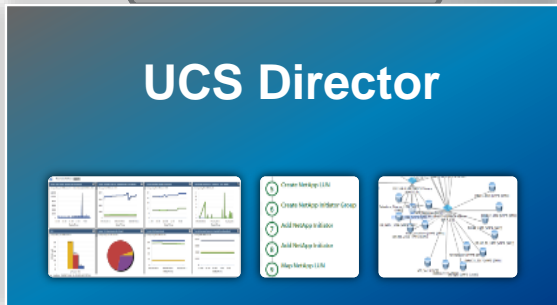
# Cisco UCS Director



**On-Demand  
Automated Delivery**

**Single Pane of Glass**

**End-to-End  
Infrastructure  
Automation and  
Lifecycle Management**



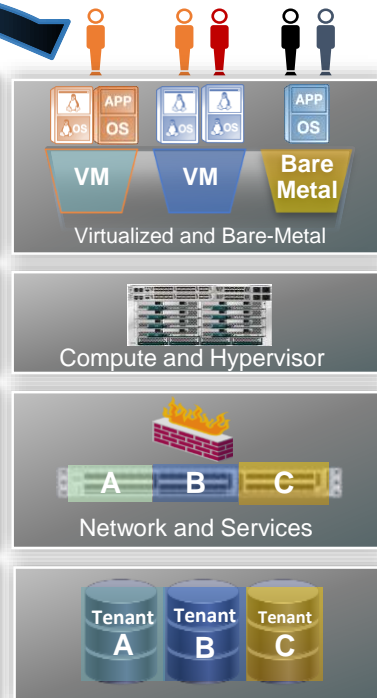
**Domain  
Managers**

OS and Virtual  
Machines

Compute

Network

Storage



# Broad Multi-Vendor Infrastructure Support



## UCS Director

### Converged



### VM



### L4-L7



### Compute



### Network



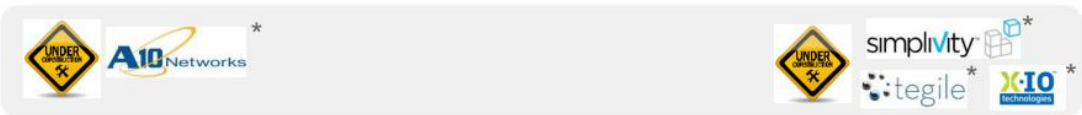
### Storage



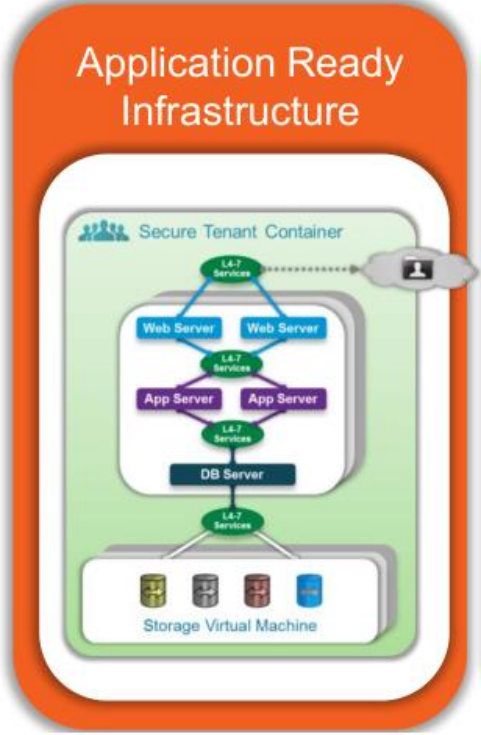
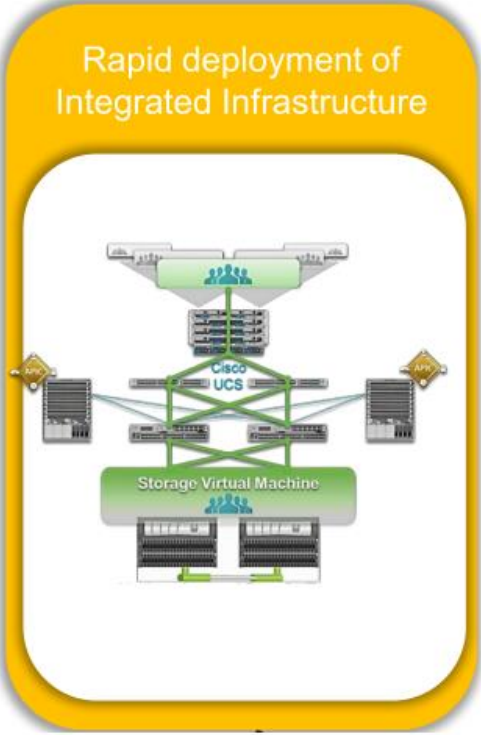
NEW

NEW

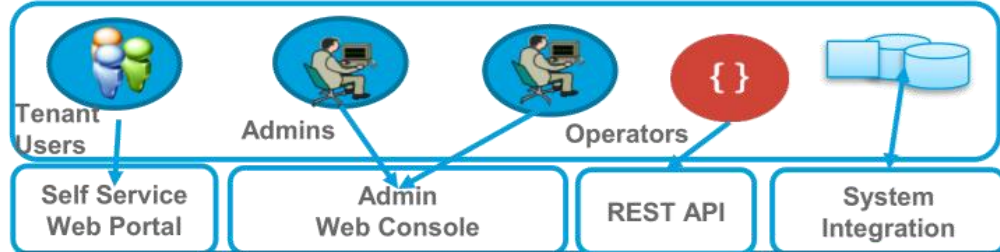
NEW



# UCSD : Key use cases



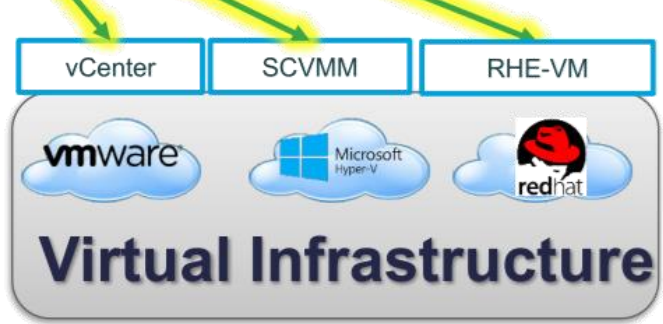
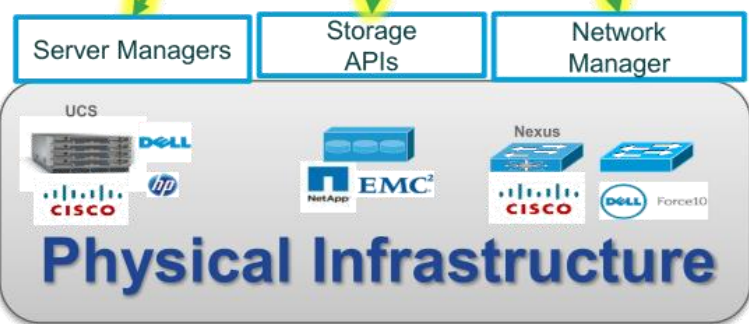
# UCSD : Solution overview



- ✓ LDAP, Active Directory
- ✓ RBAC
- ✓ IT Ticketing Systems
- ✓ CMDB
- ✓ Metering/Chargeback



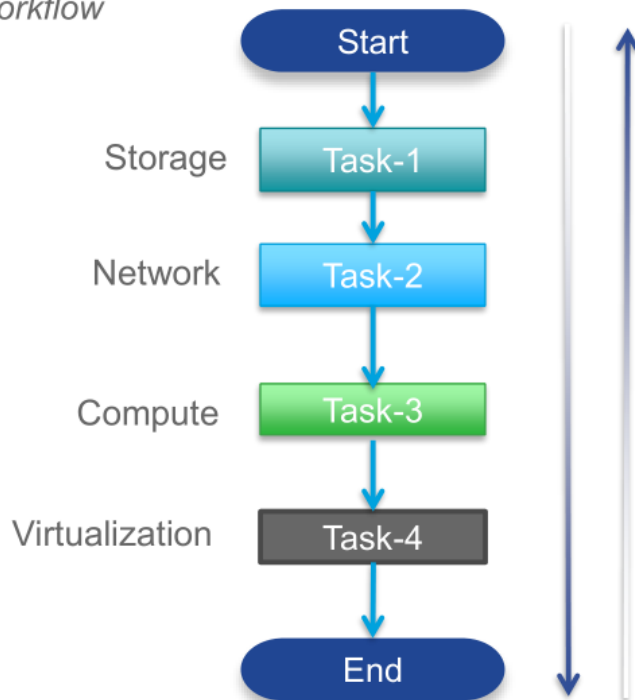
Open Automation Framework



# UCSD : Introducing Orchestration and Workflows



*my-workflow*



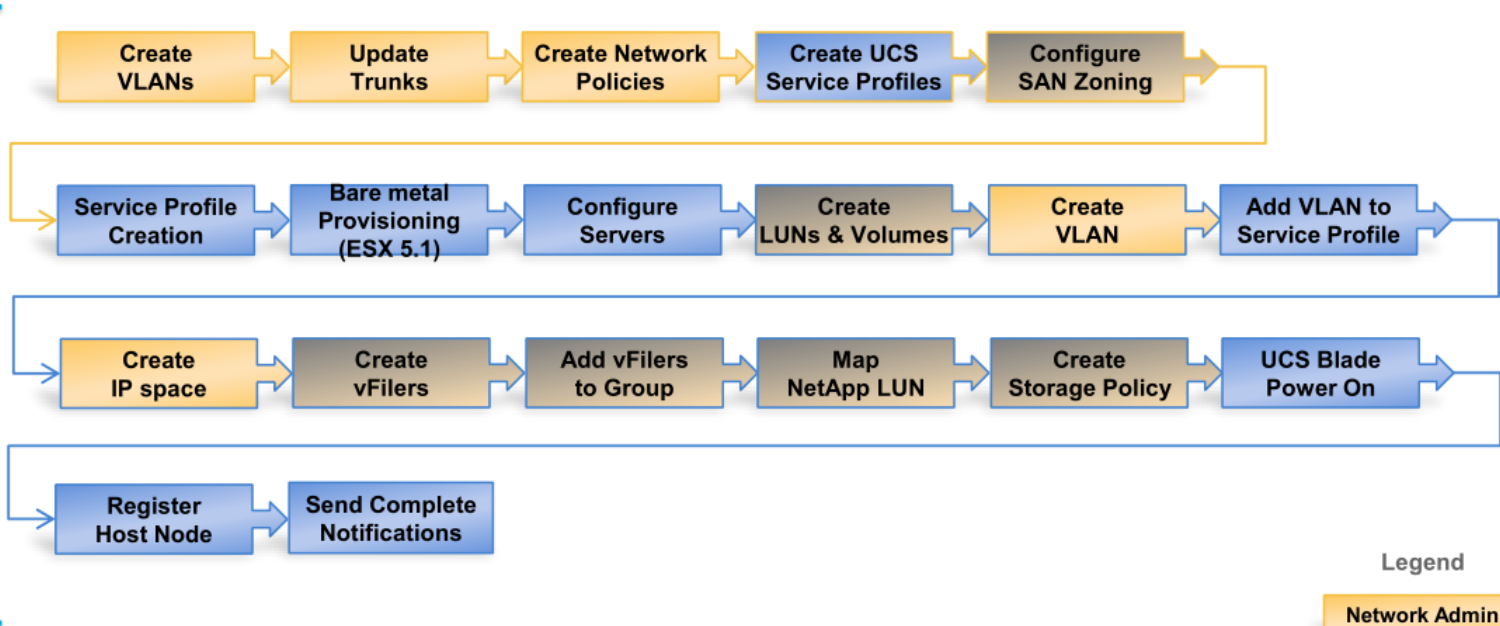
- ✓ Suspend/Resume Workflow
- ✓ **Rollback Workflow**
- ✓ Approvals
- ✓ Complex logic (loops, if-else)
- ✓ Import/Export, Versioning
- ✓ Schedules
- ✓ Custom Workflow Input Types
- ✓ **Publish to Catalog**



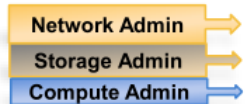
# UCSD : Sample workflow



Orchestrated  
Workflow



Legend



# UCSD : Workflow designer



## Workflow Designer - Create VLANs (61)

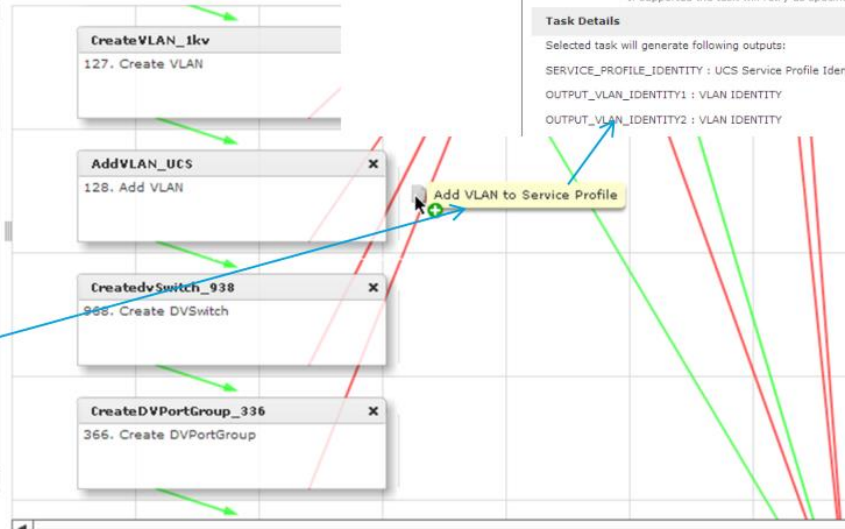
Available Tasks

Edit Workflow Properties Validate Workfl

Auto Layout  Compact View Mode

- ▶ Cloupia Tasks
- ▶ Compound Tasks
- ▶ Context Mapper Tasks
- ▶ Custom Approval Tasks
- ▶ Custom Tasks
- ▶ Physical Compute Tasks
  - ▶ CIMC Tasks
  - ▶ Cisco UCS Tasks
    - Add iSCSI vNIC to Service Profile
    - Add NTP Server to UCSM
    - Add Servers to UCS Server Pool
    - Add VLAN
    - Add VLAN to Service Profile**
    - Add VLAN to vNIC Template
    - Add vNIC to UCS Service Profile
    - Associate UCS Service Profile
    - Associate UCS Service Profile Tem

To add a new task, drag and drop a task item to design area.



### Add Task (Add VLAN to Service Profile)

Task Information

User Input Mapping

Task Inputs

Workflow Task Basic Information - Enter task name and comments.

Task Name

Task Category

Task Type

Comment

Retry Execution

If supported the task will retry as specified

#### Task Details

Selected task will generate following outputs:

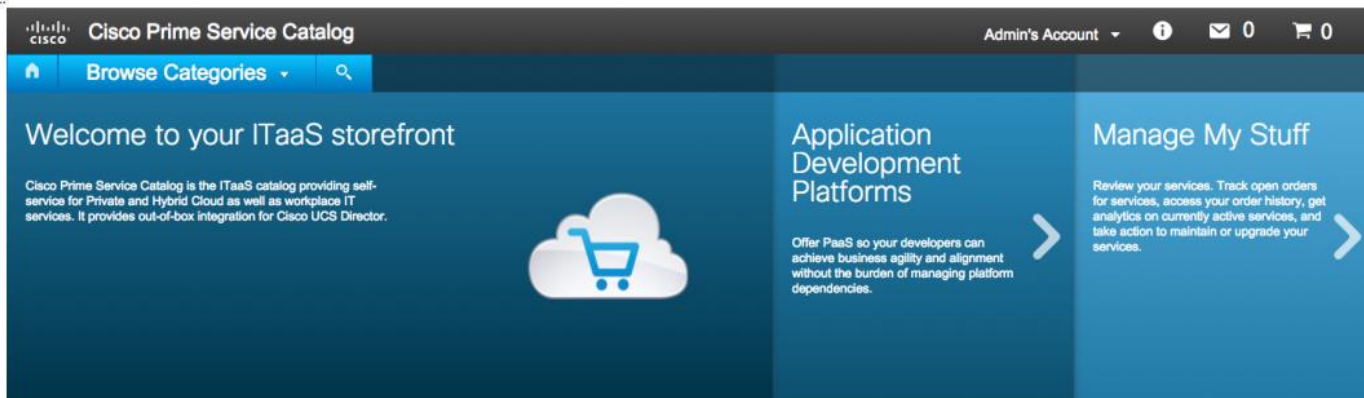
SERVICE\_PROFILE\_IDENTITY : UCS Service Profile Identity

OUTPUT\_VLAN\_IDENTITY1 : VLAN IDENTITY

OUTPUT\_VLAN\_IDENTITY2 : VLAN IDENTITY



# Cisco Prime Service Catalog



The screenshot shows the Cisco Prime Service Catalog interface. At the top, there is a navigation bar with the Cisco logo, the title "Cisco Prime Service Catalog", and user information "Admin's Account". Below the navigation bar is a search bar and a "Browse Categories" dropdown. The main content area is divided into three columns:

- Welcome to your ITaaS storefront:** A large blue section with a shopping cart icon inside a cloud. Text below reads: "Cisco Prime Service Catalog is the ITaaS catalog providing self-service for Private and Hybrid Cloud as well as workplace IT services. It provides out-of-box integration for Cisco UCS Director."
- Application Development Platforms:** A blue section with a right-pointing arrow. Text below reads: "Offer PaaS so your developers can achieve business agility and alignment without the burden of managing platform dependencies."
- Manage My Stuff:** A blue section with a right-pointing arrow. Text below reads: "Review your services. Track open orders for services, access your order history, get analytics on currently active services, and take action to maintain or upgrade your services."

## Enterprise IT Services

All of your personal services in one place.



## Cloud Computing Services

Fulfill your cloud computing needs with a full suite of virtual services.



## Private Cloud IaaS

Cisco Prime Service Catalog is the ITaaS catalog providing self-service for Private and Hybrid Cloud...

## Essential Workplace Services

Select the best tools for your role





# PSC-UCSD Integration

Cisco Prime Service Catalog admin admin ▾

**Manage Connections**

UCS Director Intercloud Fabric for Business Puppet

**Connections**

- ▶ Discovered Services
- ▶ Manage Workflows
- ▶ Discovered Objects

**Connections**

✎ ✕ + ↺ ⚙
Test Connection
Connect & Import
Show Log

Identifier	Name	Host Name or IP Address	Protocol	Port	Certificate	Username	Password	Sync User with IaaS	Enable Poller
1	UCSD-Csbi-Lao	10.113.89.126	http	80				<input type="checkbox"/>	<input type="checkbox"/>


- Discovered Groups(1)
- Discovered Catalog(3)
- Discovered vDCs(2)
- Discovered Images(1)
- Discovered Workflow(125)
- Discovered Virtual Machines(27)
- Imported Groups(1)
- Imported Images(1)



# PSC : End User UI

Cisco Prime Service Catalog Admin's Account 0 0

[Browse Categories](#)

 Private Cloud IaaS

**Narrow Your Results**

**RATINGS**

- ★★★★★ and up
- ★★★★☆ and up
- ★★★☆☆ and up
- ★★☆☆☆ and up
- No Rating

Service  
50 X 50px

### 3-Tier-App(1)

★★★★☆ (0)

[Order For Others](#) | [Order](#)



### Install your UCS Director services here

☆☆☆☆☆ (0)

Cisco UCS Director is the premier converged infrastructure as a service (IaaS) management solution for from Cisco.

[More...](#) |

Service  
50 X 50px

### Add Volume(1)

★★★★☆ (0)

[Order For Others](#) | [Order](#)

Service  
50 X 50px

### Ubuntu VM(1)

★★★★☆ (0)

[Order For Others](#) | [Order](#)



# Cisco Hybrid Cloud Architecture

## 'Any' Hypervisor, 'Any' Cloud with Security and Data Sovereignty



You



Consistent  
Operation  
Model



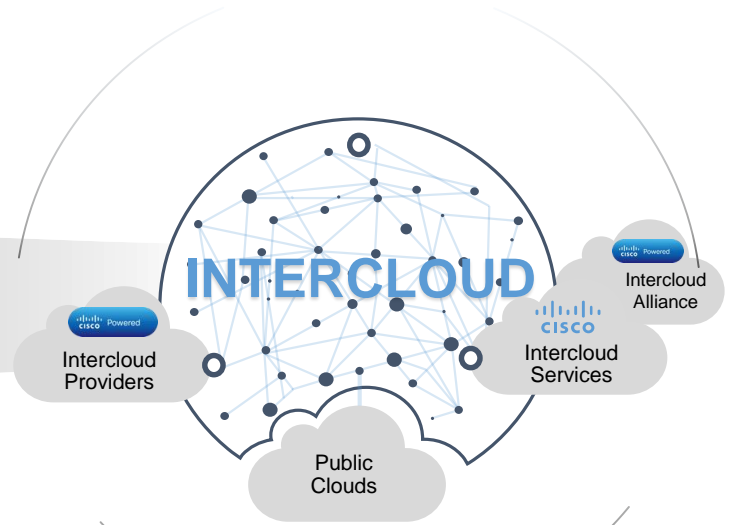
Enterprise Security



Flexible Bi-directional  
Workload Placement



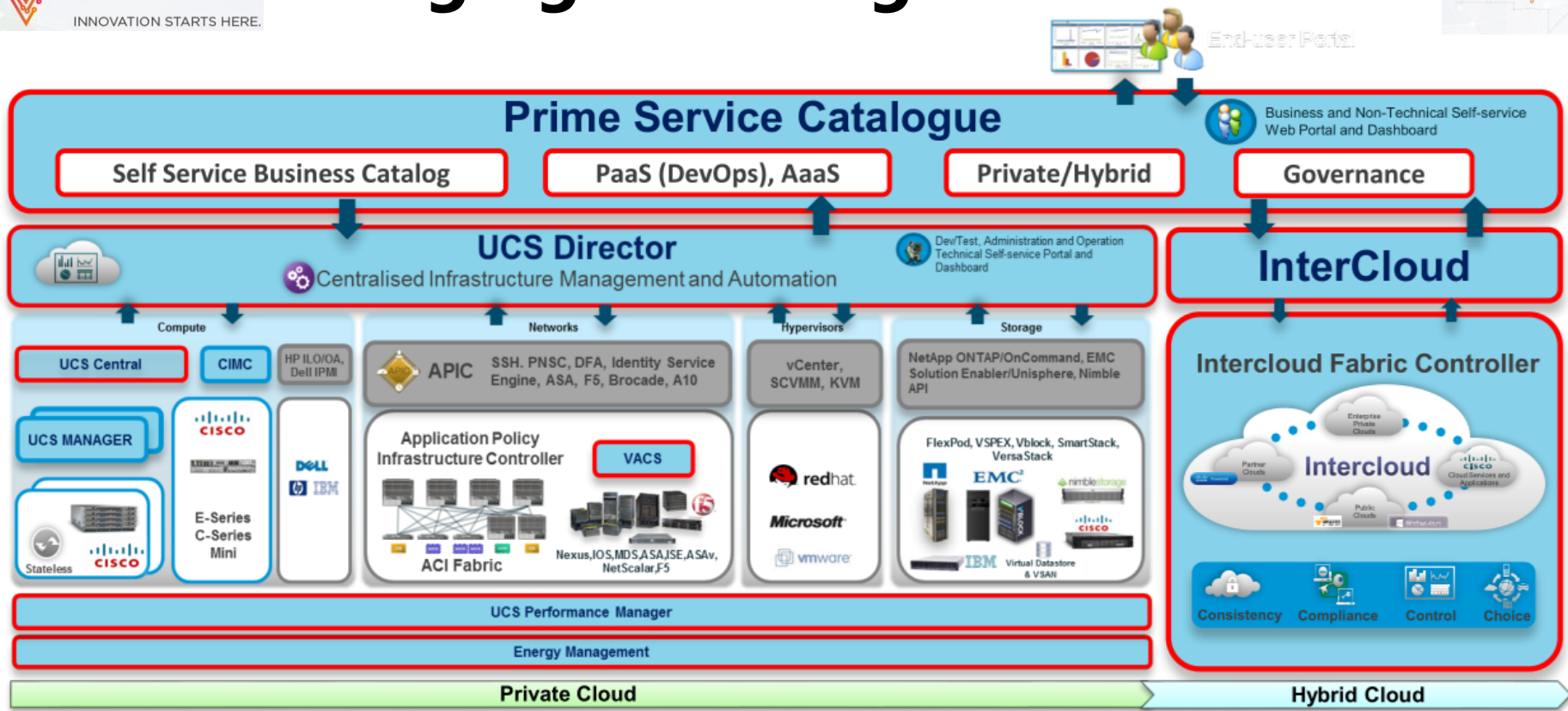
Infrastructure Extension



**350** Data Centers  
**65** Partners  
**50** Countries



# Bringing It All Together







**3S**

**TECHNOLOGY  
CITY**

INNOVATION STARTS HERE.