TOMORROW
starts here.

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Comprehensive Data Centre and Cloud Management with UCS Director

BRKVIR-2602

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#clmel

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Agenda

- Market Dynamics

- Private Cloud Architecture

- Data Centre Complexities

- Cisco UCS Director

- Cisco UCS Director - Demo

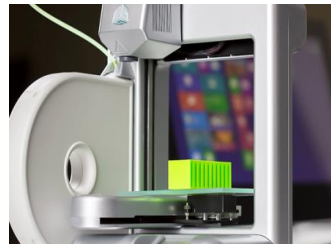- Foundation of Private Cloud

- Conclusion

Market Dynamics
Lines of business are driving Cloud and Data Centre Transformation

Competitive advantage is being driven through new apps & services

Speed & Agility are key requirements of Fast IT

Rapid prototyping and lowering the time and cost of failure underpin this


Business is looking to the Cloud for solutions

Cloud has changed the perception of what is possible with the power of IT Shadow IT is becoming an increasing reality when traditional IT is too slow IT has the opportunity to step up with private, hybrid and public offerings

Your Strategy Starts with Applications
Categorise Application Requirements based on Business Needs
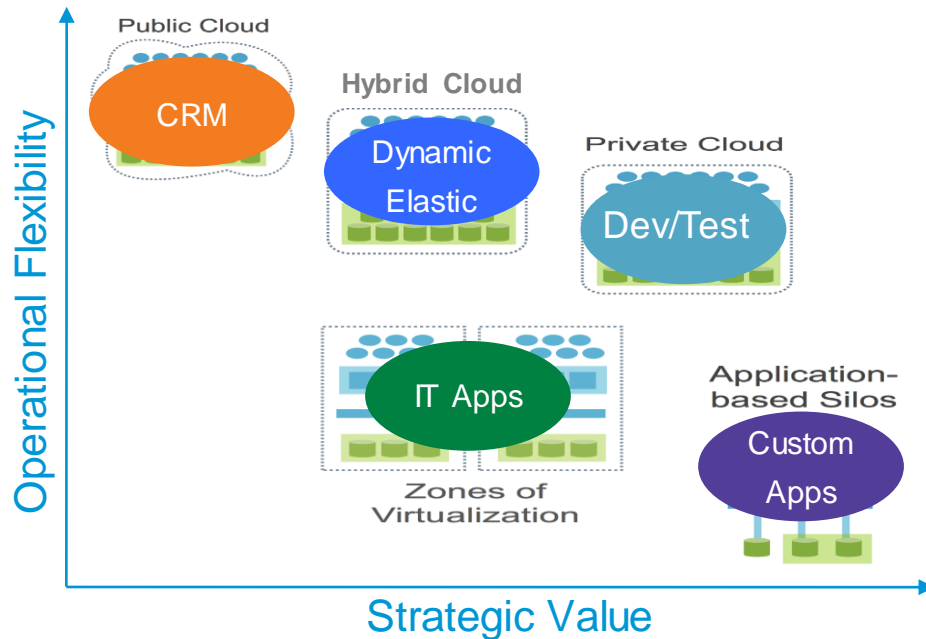
Zones of Virtualisation
- Core IT application consolidation
- Moderately dynamic
- No self-service requirements

Private Cloud
- Core-defined services
- Highly dynamic
- Self-service and metering

Hybrid Cloud
- Applications that require dynamic infrastructure
- Dev-test workloads requiring parallel testing
- Web scale workloads with Enterprise requirements

Public Cloud
- Context applications
- Adapt to dynamic demands
- Self-service and pay as you go
- Readily available cloud services

Private Cloud Architecture

Private Cloud Architecture Requirements

Modular Stateless Computing Elements

UNIFIED COMPUTING

- Unite computing, network, storage access, and virtualisation
- Deliver cohesive system that reduces TCO and increases business agility

Highly Scalable, Secure Network Fabric

UNIFIED FABRIC

- Deliver architectural flexibility for all Data Centres
- Provides consistent networking across physical, virtual and cloud

Automated Resource Management (Physical and Virtual)

UNIFIED MANAGEMENT

- Simplify and automate IT provisioning with policy-based management
- Deliver physical and virtual resources on-demand for greater flexibility and agility

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Data Centre Complexities

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Converged Infrastructure Overview

Build Your Own or Buy it pre-Integrated & Tested

VS

What are the characteristics of converged Infrastructure stacks?
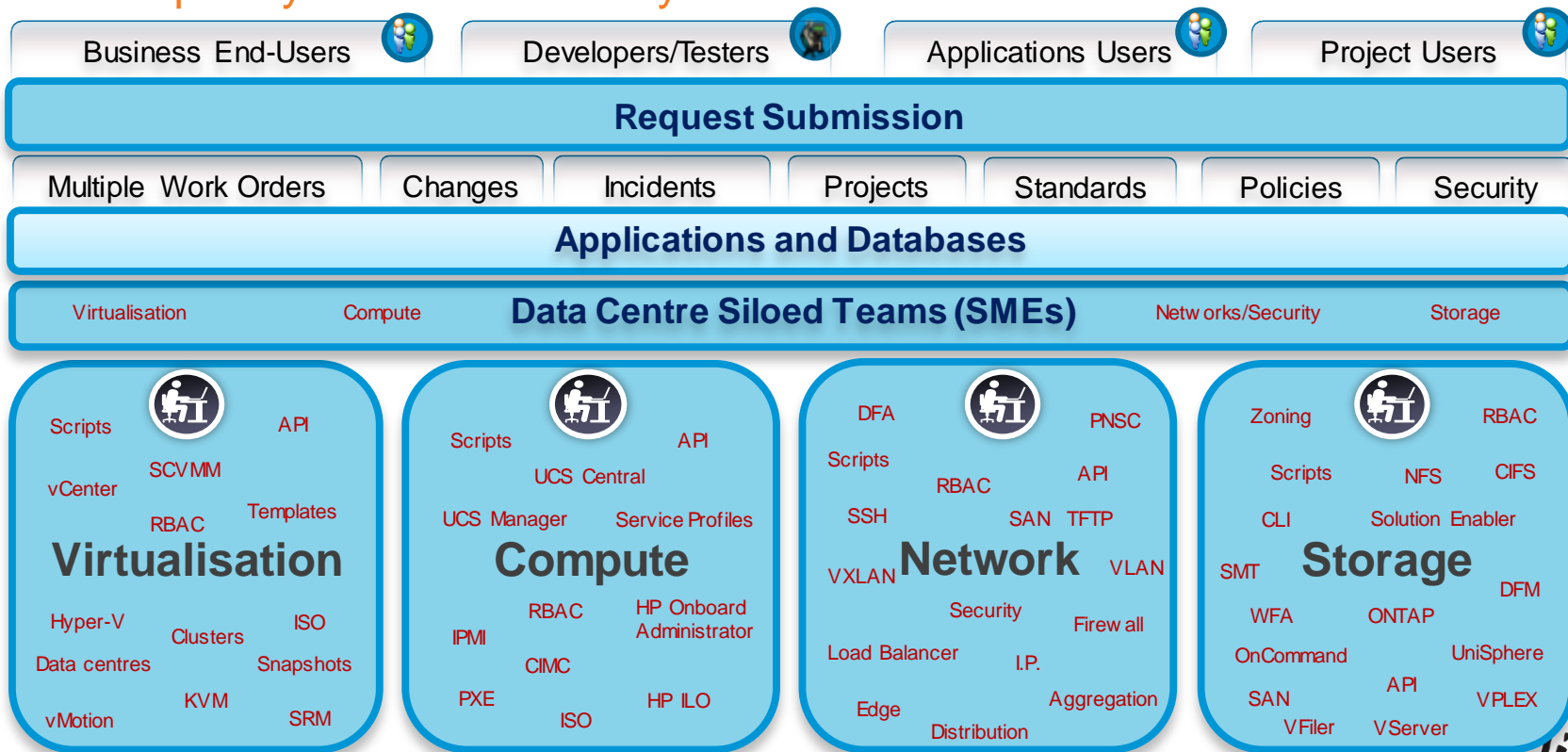
- Integrated and easy to deploy
- Pre-engineered & validated
- Policy driven and programmable
- Simple to scale & manage

Why are converged Infrastructure stacks the fastest growing IT segment (38%)?

- Delivers agile pools of infrastructure that can easily be automated
- Built-in security meets regulatory needs
- Proven reduction for CAPEX and OPEX

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Data Centre Reality
I.T. Complexity and Inconsistency

Business End-Users	Developers/Testers	Applications Users	Project Users

Request Submission

Multiple Work Orders	Changes	Incidents	Projects	Standards	Policies	Security

Applications and Databases

Virtualisation   Compute   **Data Centre Siloed Teams (SMEs)**   Networks/Security   Storage

Virtualisation
- Scripts
- API
- SCVMM
- vCenter
- RBAC
- Templates
- Hyper-V
- ISO
- Clusters
- Data centres
- Snapshots
- KVM
- vMotion
- SRM

Compute
- Scripts
- API
- UCS Central
- UCS Manager
- Service Profiles
- RBAC
- HP Onboard Administrator
- IPMI
- CIMC
- PXE
- HP ILO
- ISO

Network
- DFA
- PNSC
- Scripts
- RBAC
- API
- SSH
- SAN
- TFTP
- VXLAN
- VLAN
- Security
- Firewall
- Load Balancer
- I.P.
- Edge
- Aggregation
- Distribution

Storage
- Zoning
- RBAC
- Scripts
- NFS
- CIFS
- CLI
- Solution Enabler
- SMT
- DFM
- WFA
- ONTAP
- OnCommand
- UniSphere
- SAN
- API
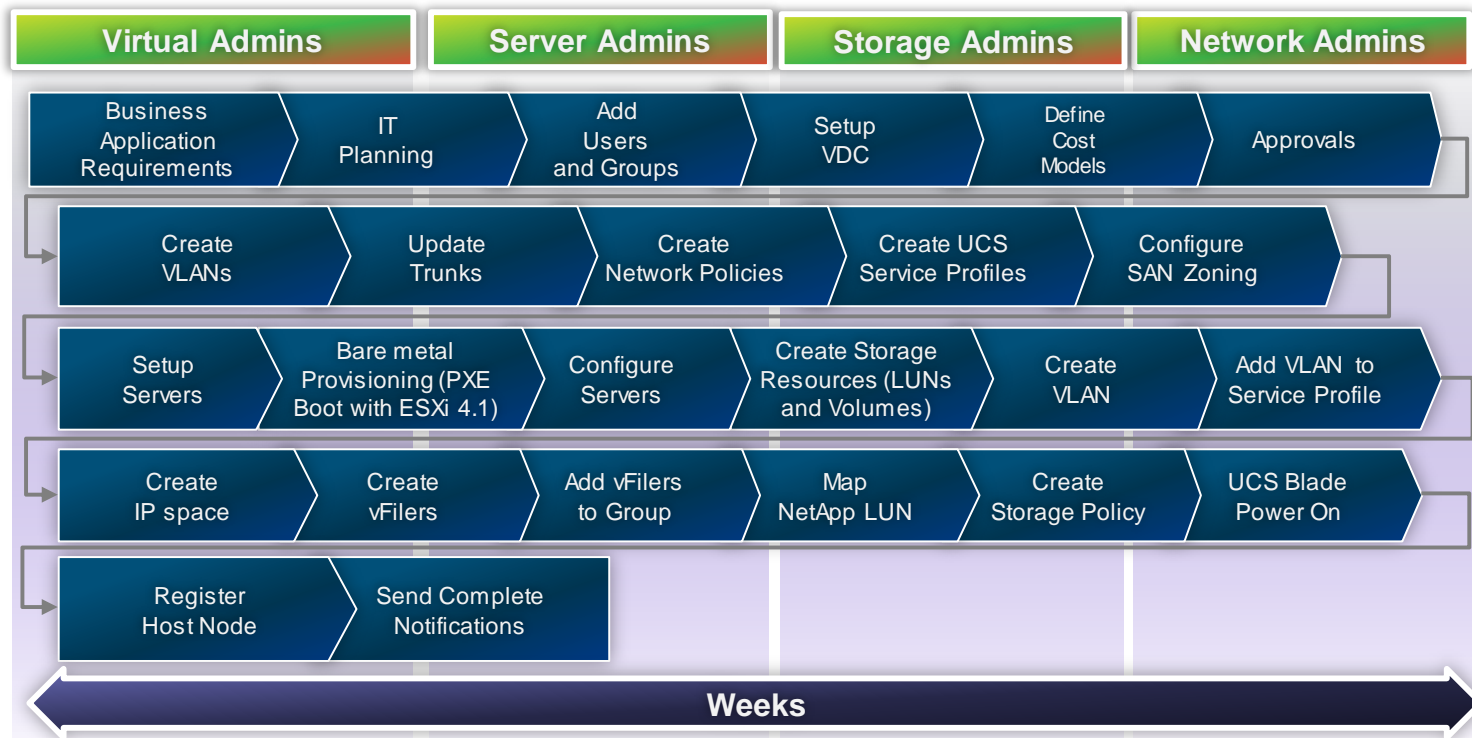- VPLEX
- VFiler
- VServer

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Cisco UCS Director

How are We Managing Converged Infrastructure?

Challenges:

- Many groups
- Many human interfaces
- Manual steps

Result:
High latency

Virtual Admins		Server Admins		Storage Admins		Network Admins
Business Application Requirements	IT Planning	Add Users and Groups	Setup VDC	Define Cost Models	Approvals	
Create VLANs	Update Trunks	Create Network Policies	Create UCS Service Profiles	Configure SAN Zoning		
Setup Servers	Bare metal Provisioning (PXE Boot with ESXi 4.1)	Configure Servers	Create Storage Resources (LUNs and Volumes)	Create VLAN	Add VLAN to Service Profile	
Create IP space	Create vFilers	Add vFilers to Group	Map NetApp LUN	Create Storage Policy	UCS Blade Power On	
Register Host Node	Send Complete Notifications					

Weeks

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UCS Director Overview

End-User Self Service Portal and Orchestration

FlexPod   Vblock   VSPEX   Adhoc

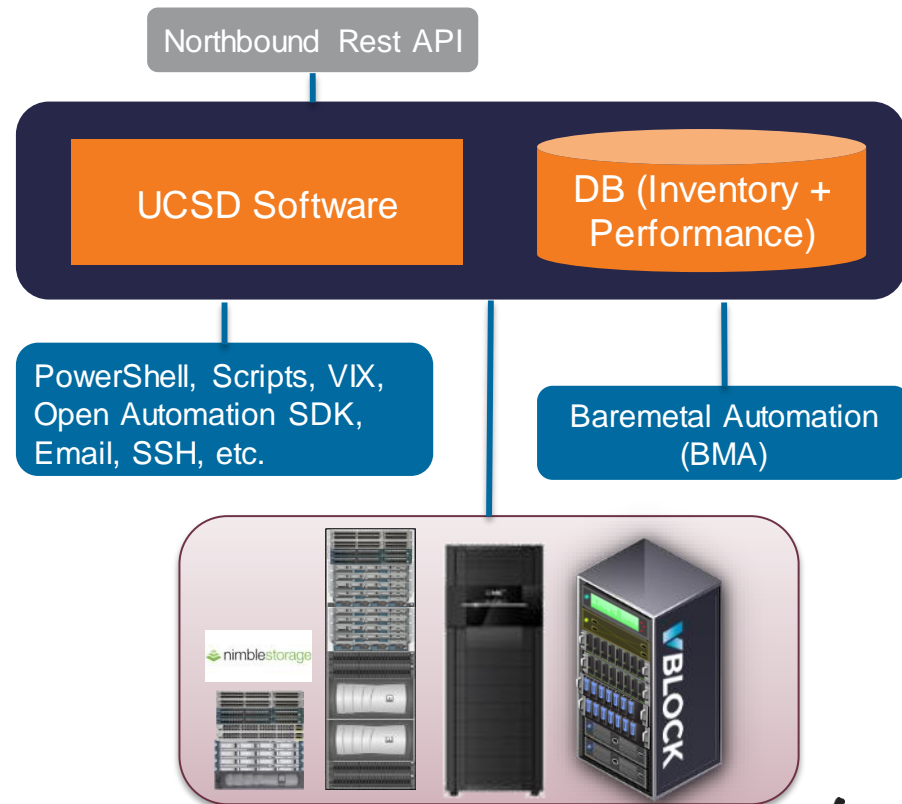**UCS Director provides the automation and orchestration foundation for Private Cloud**

- Provisioning of physical/virtual compute, network, storage and hypervisor resources

- Enables self service in compliance with IT policies and approvals

- Provides chargeback or show-back of cost

Improves IT operational efficiency

- Replacing managing each layer individually with automated workflows

- Removes silos by allowing IT to manage infrastructure through a single pane of glass

- Reduces manual activities to allow resources to focus on value-add services for business

UCS Director Scalability

- Environment Support
  - Up to **5000** element Managers or end-points
  - **50,000** managed virtual machines

- Minimum System Requirements
  - 64 Bit (VMware or Hyper-V) appliance
  - 4 x vCPU, 8 GB Memory (Reserved)
  - Disk: 100 Gig

- Horizontal Scalability Support

Northbound Rest API

UCSD Software

DB (Inventory + Performance)

PowerShell, Scripts, VIX, Open Automation SDK, Email, SSH, etc.

Baremetal Automation (BMA)

nimblestorage

VBLOCK

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How Does UCS Director Work
Administrators → Policy Makers → Automation → Self-service Catalogue
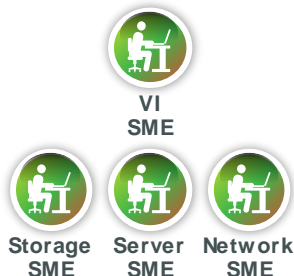
Access configuration, VLAN, VSAN, Security, and Hardening

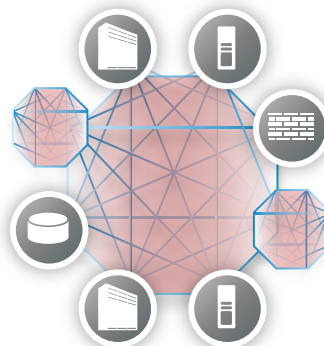Operating System Configuration OS Type, Patch Level, Settings

Network interface card (NIC) configuration: MAC address, VLAN, and QoS settings; host bus adapter HBA configuration: worldwide names (WWNs), VSANs, and bandwidth constraints; and firmware revisions

Unique service ID, Application revisions, and Storage settings

Application resources: Server, Storage, Network Security, OS

VI SME

Storage SME **Server SME** **Network SME**

① Subject matter experts define policies
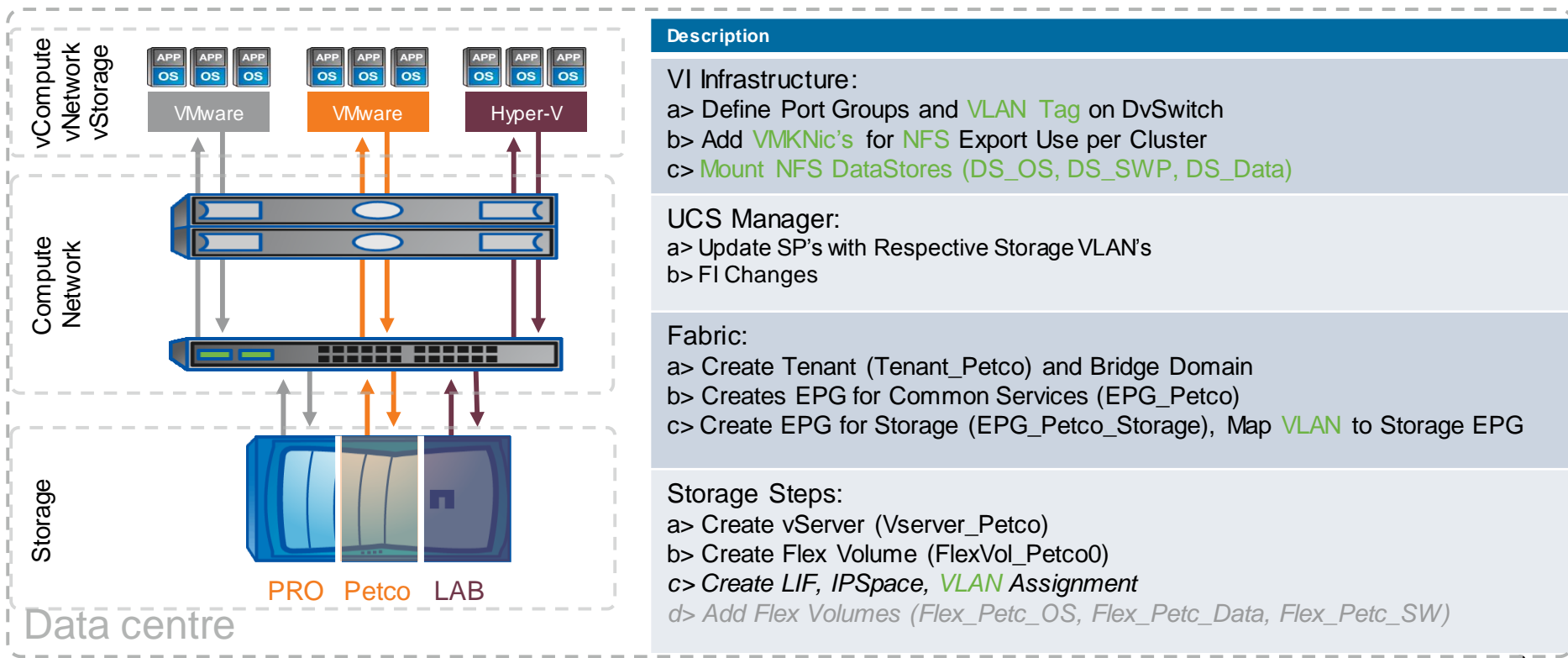
② Policies used to create Infrastructure

③ Pools, policies, templates are used to Infrastructure from templates

④ Associating application profiles with fabric configures all needed application resources automatically

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Bringing Infrastructure Together

Description
VI Infrastructure: a> Define Port Groups and VLAN Tag on DvSwitch b> Add VMKNic's for NFS Export Use per Cluster c> Mount NFS DataStores (DS_OS, DS_SWP, DS_Data)
UCS Manager: a> Update SP's with Respective Storage VLAN's b> FI Changes
Fabric: a> Create Tenant (Tenant_Petco) and Bridge Domain b> Creates EPG for Common Services (EPG_Petco) c> Create EPG for Storage (EPG_Petco_Storage), Map VLAN to Storage EPG
Storage Steps: a> Create vServer (Vserver_Petco) b> Create Flex Volume (FlexVol_Petco0) c> Create LIF, IPSpace, VLAN Assignment d> Add Flex Volumes (Flex_Petc_OS, Flex_Petc_Data, Flex_Petc_SW)

vCompute vNetwork vStorage

APP OS APP OS APP OS   VMware
APP OS APP OS APP OS   VMware
APP OS APP OS APP OS   Hyper-V

Compute Network

Storage

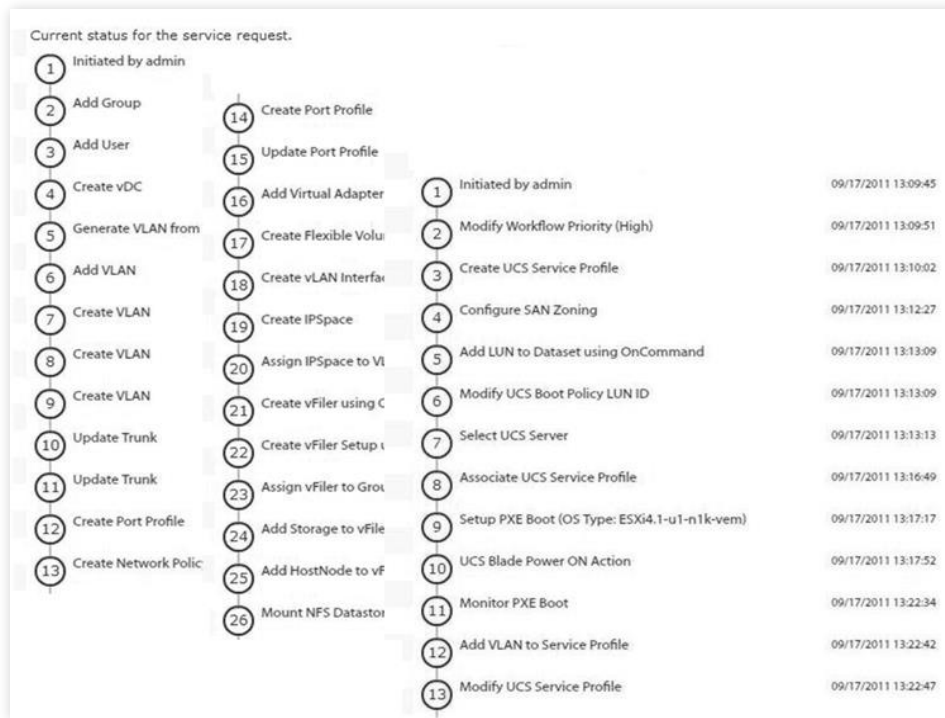PRO   Petco   LAB

Data centre

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UCS Director
End-to-End Operations and Provisioning

- Single-click provisioning

- Intelligent resource allocation

- Automated, controlled delivery

Result:
Improved delivery time

Current status for the service request.

1. Initiated by admin
2. Add Group
3. Add User
4. Create vDC
5. Generate VLAN from
6. Add VLAN
7. Create VLAN
8. Create VLAN
9. Create VLAN
10. Update Trunk
11. Update Trunk
12. Create Port Profile
13. Create Network Polic

14. Create Port Profile
15. Update Port Profile
16. Add Virtual Adapter
17. Create Flexible Volu
18. Create vLAN Interfa
19. Create IPSpace
20. Assign IPSpace to VI
21. Create vFiler using C
22. Create vFiler Setup
23. Assign vFiler to Grou
24. Add Storage to vFile
25. Add HostNode to vF
26. Mount NFS Datastor

1	Initiated by admin	09/17/2011 13:09:45
2	Modify Workflow Priority (High)	09/17/2011 13:09:51
3	Create UCS Service Profile	09/17/2011 13:10:02
4	Configure SAN Zoning	09/17/2011 13:12:27
5	Add LUN to Dataset using OnCommand	09/17/2011 13:13:09
6	Modify UCS Boot Policy LUN ID	09/17/2011 13:13:09
7	Select UCS Server	09/17/2011 13:13:13
8	Associate UCS Service Profile	09/17/2011 13:16:49
9	Setup PXE Boot (OS Type: ESXi4.1-u1-n1k-vem)	09/17/2011 13:17:17
10	UCS Blade Power ON Action	09/17/2011 13:17:52
11	Monitor PXE Boot	09/17/2011 13:22:34
12	Add VLAN to Service Profile	09/17/2011 13:22:42
13	Modify UCS Service Profile	09/17/2011 13:22:47

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UCS Director Extensive Task Library

Rapid Creation of Orchestration Workflows

- Over 1,300 converged tasks across heterogeneous devices (Continuous Dev.)

- Drag 'n drop creation

- Rollback built-in (auto de-provision)

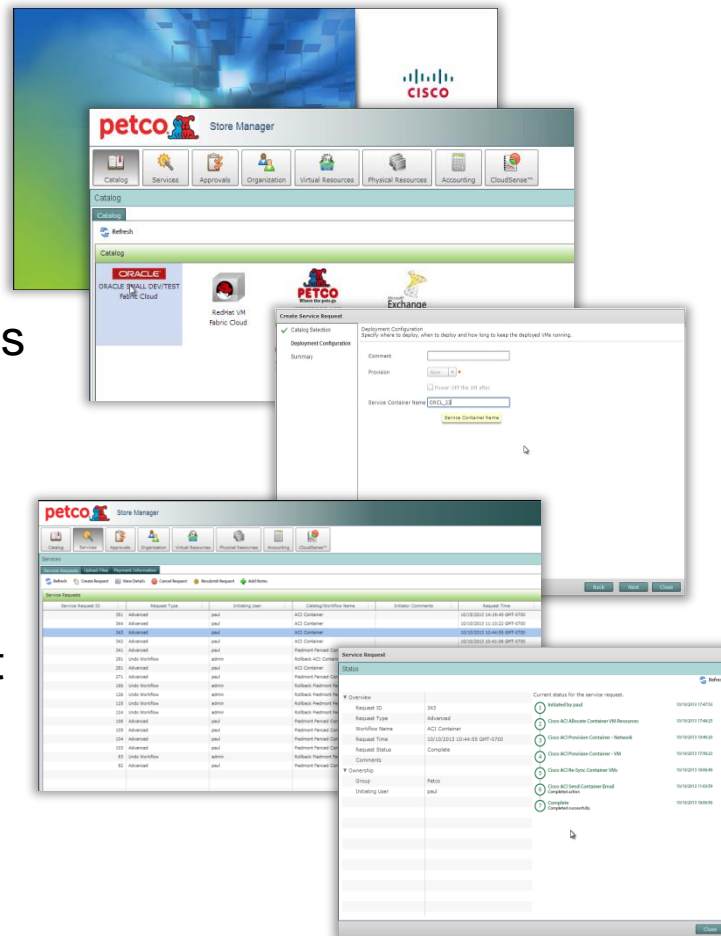- Cisco Support Communities (Workflows)

UCS Tasks

- Select UCS Server
- Reset UCS Server
- Power On UCS Server
- Power Off UCS Server
- Create UCS Service Profile from Template
- Create UCS Service Profile
- Select UCS Service Profile
- Modify UCS Service Profile Boot Policy
- Delete UCS Service Profile
- Associate UCS Service Profile
- Disassociate UCS Service Profile
- Create UCS Boot Policy

- Modify UCS Boot Policy LUN ID
- Clone UCS Boot Policy
- Modify UCS Boot Policy WWPN
- Add VLAN
- Delete UCS Boot Policy
- Delete UCS VLAN
- Add VLAN to Service Profile
- Add iSCSI vNIC to Service Profile
- Add vNIC to Service Profile
- Delete vNIC from Service Profile
- Create Service Profile iSCSI Boot Policy
- Modify Service Profile Boot Policy to Boot from iSCSI
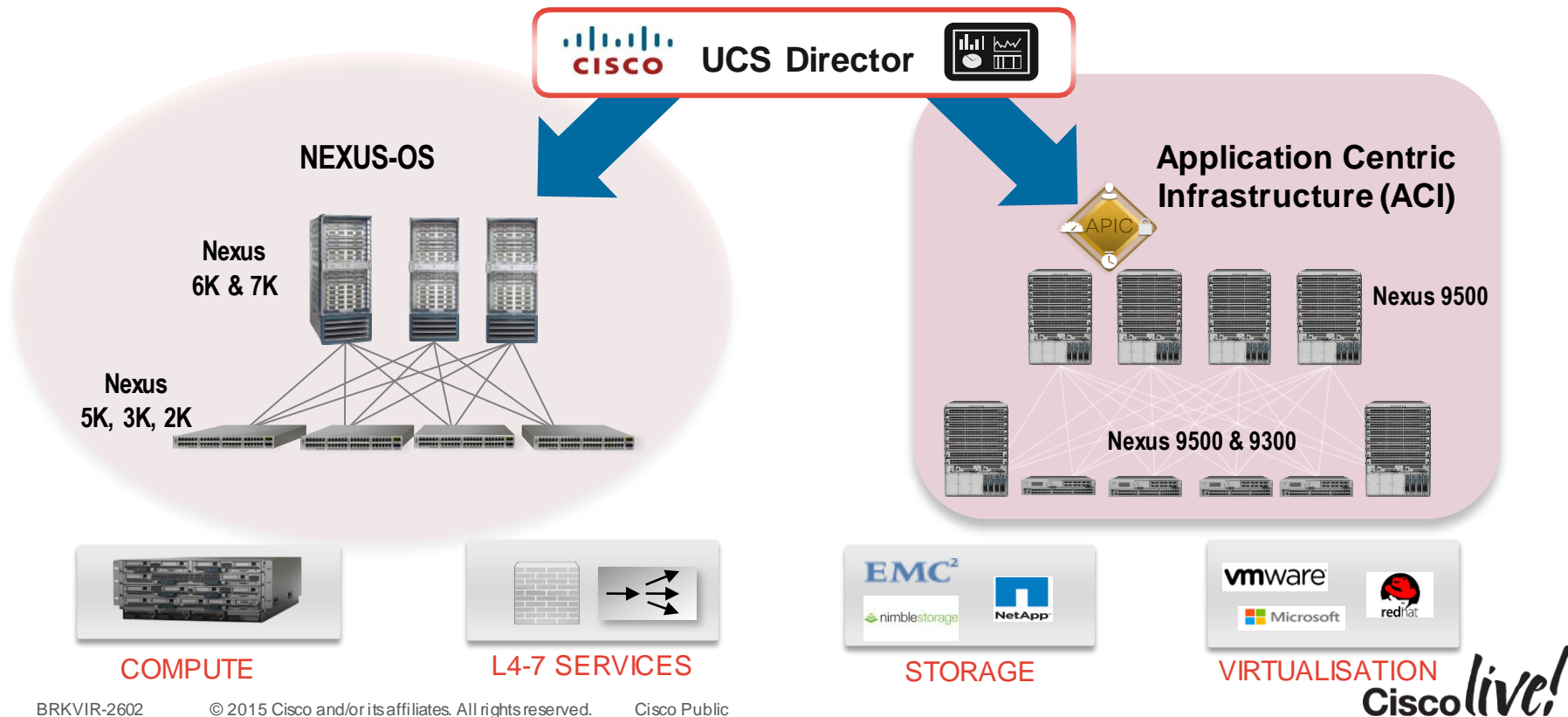
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UCS Director
Self-service Portal

- Log in to the self-service portal and select among the ACI Application Profiles published by the service provider

- Provide custom information for this instance and request deployment

- Within the portal, review the status of all application services and the deployment progress of application components
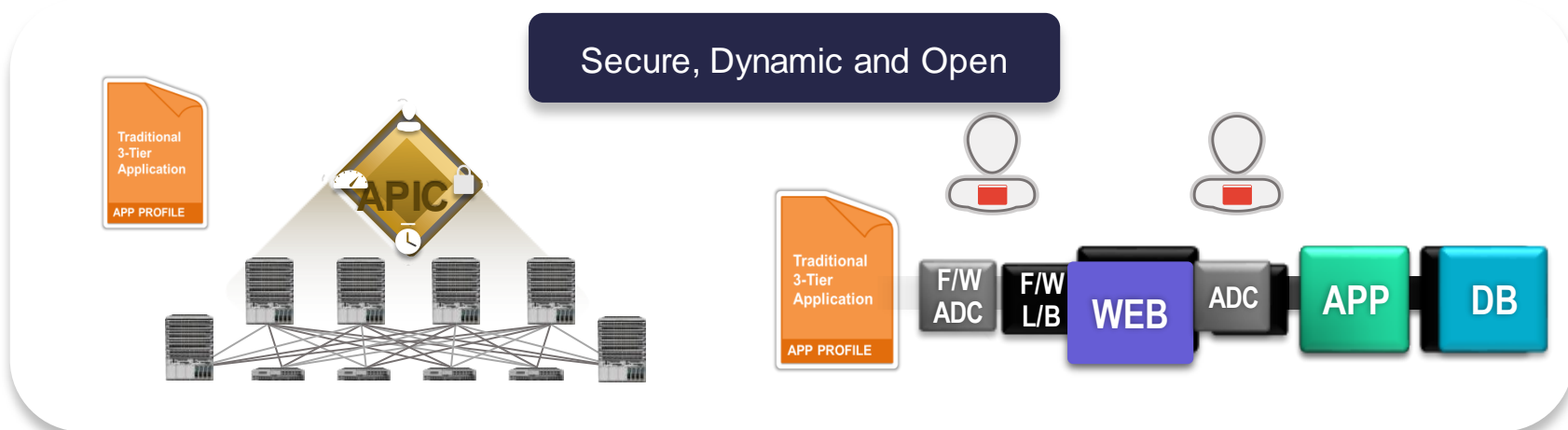
UCS Director
Manage Mixed Container Environments

CISCO **UCS Director**

NEXUS-OS

Nexus 6K & 7K

Nexus 5K, 3K, 2K

Application Centric Infrastructure (ACI)

APIC

Nexus 9500

Nexus 9500 & 9300

COMPUTE

L4-7 SERVICES

STORAGE

EMC²
nimblestorage
NetApp

VIRTUALISATION

vmware
Microsoft
redhat

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UCS Director ACI Support Overview

Secure, Dynamic and Open

Traditional 3-Tier Application — APP PROFILE

APIC

F/W ADC | F/W L/B | WEB | ADC | APP | DB

ACI translates the requirements of Applications into Infrastructure policies

- Applications guide the network – not vice versa

- Policies provision the application network (L4-7)

- End-to-end visibility with programmability

- Provides investment protection for installed base

With ACI IT infrastructure teams can:

- Can respond to developer's demands for dynamic location of applications.

- Support dynamic application instantiation/ removal.

- Provide scale-out models that require greater network performance and scalability

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UCS Director and ACI

- ACI delivers automated network services designed for each application

- UCS Director binds network services with compute, storage & virtualisation

- Simple-to-use wizards establish policies across all layers

- Infrastructure containers delivered from single API, on-demand

- Accelerated deployment of infrastructure supporting applications
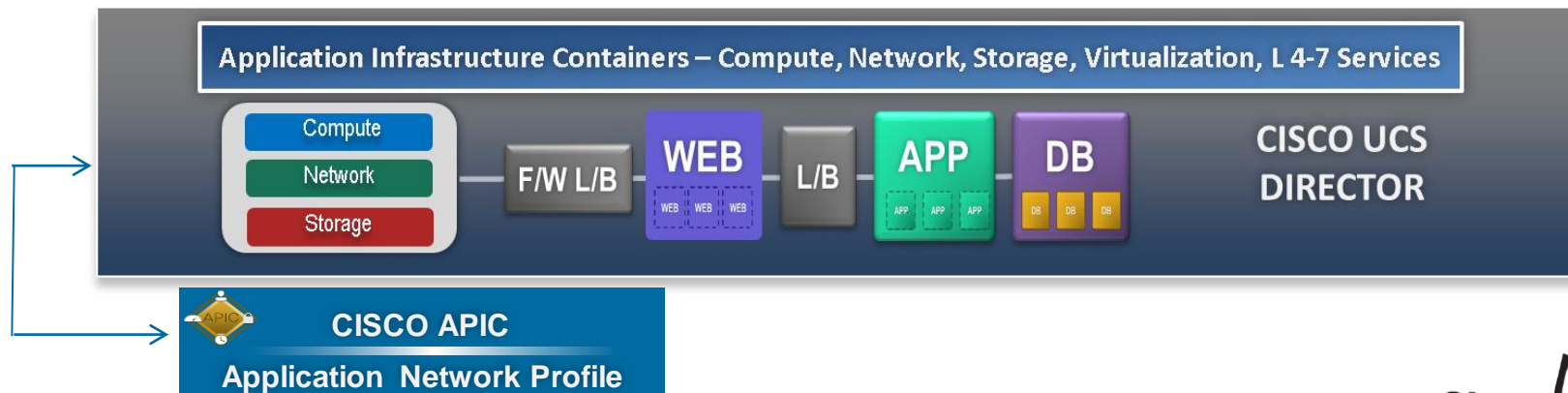
Cisco ACI Application Profile Definition

Creating an Application Profile with UCS Director:

- Define ACI Network Tiers for delivering application resources within a secure tenant container

- Define the suitable capacity and quality of UCS physical and virtual compute and NetApp storage resources for each application component

- Define the Cisco ACI network services required to deliver the appropriate service quality and security for the application
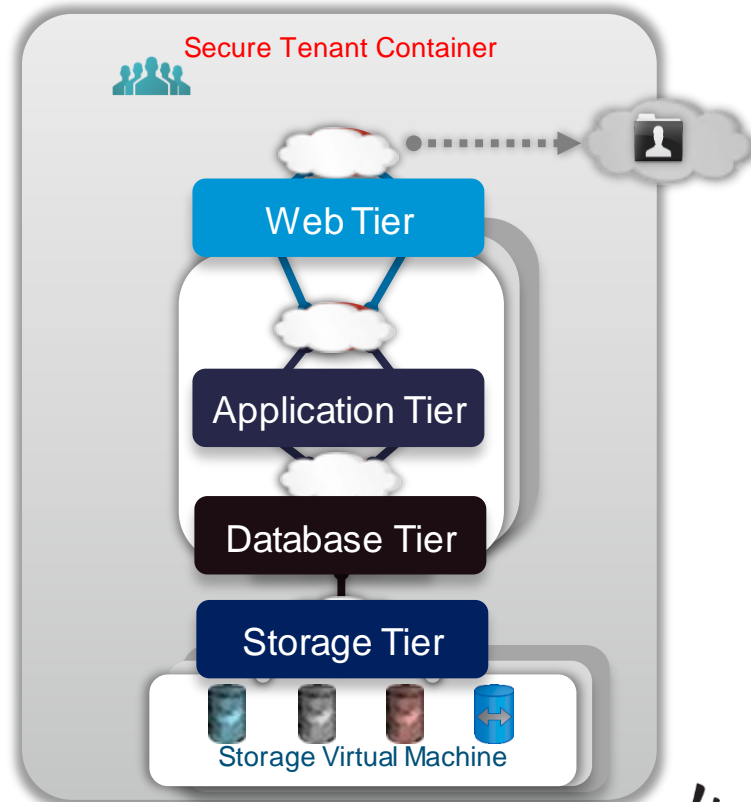
Secure Tenant Container

Web Tier

Application Tier

Database Tier

Storage Tier

Storage Virtual Machine

Demo

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The Foundation of Cisco Private Cloud

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The Foundation of Cisco Private Cloud

Converged Infrastructure

Vblock, Flexpod, VSPEX

- Programmable
- Scalable
- Flexible
- Market leading

Intelligent Network Fabric

Cisco ACI

Application Aware
Open Standards
L4-7 automation

Automation & Orchestration

UCS Director

Infrastructure Automation
Self Service
Rapid provisioning
Chargeback/Showback

Private/Hybrid/XaaS Cloud Solution Overview

Prime Service Catalogue

Business and Non-Technical Self-service Web Portal and Dashboard

| Self Service Business Portal | Workplace Services | Private/Hybrid Cloud | PaaS (DevOps), AaaS | SaaS | XaaS |

UCS Director

Administration and Operation Technical Self-service Portal and Dashboard

Centralised Infrastructure Management and Automation

Intercloud

Process Orchestrator

UCS Performance Manager

HP ILO/ OA, Dell IPMI

UCS CENTRAL

CIMC

APIC — SSH. PNSC, DFA, Identity Service Engine, ASA, F5, Brocade, A10

vCenter, SCVMM, KVM

NetApp ONTAP/OnCommand, EMCSolution Enabler/Unisphere, Nimble

Intercloud Fabric for Business

UCS MANAGER

E-Series C-Series

Application Policy Infrastructure Controller

red hat

Microsoft

vmware

FlexPod, VSPEX, Vblock, SmartStack

EMC²

nimblestorage

Stateless

CISCO

DELL IBM HP
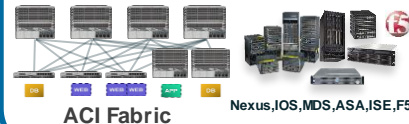
ACI Fabric

Nexus,IOS,MDS,ASA,ISE,F5

Virtual Datastore

Enterprise Private Clouds

Partner Clouds

Intercloud

Cisco Cloud Services and Applications

Public Clouds

WindowsAzure

Consistency   Compliance   Control   Choice

- Service Desk (Create, update, close request)
- CMDB
- Business Solutions
- Billing and Chargeback
- Applications
- Databases
- Monitoring (Incident enrichment)
- Backup Solution
- IPAM
- Third Party Integrations

Compute

Networks

Hypervisors

Storage

- L2 Secure Network between Clouds
- Resource Management
- Workload Migration

Private Cloud
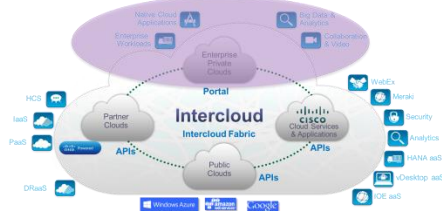
Hybrid Cloud

XaaS

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Conclusion

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Conclusion

- Converged Infrastructure Data Centre.

- Cisco Application Centric Infrastructure (ACI).

- UCS Director (Management, Governance, Self-service I.T. Catalogue)

- People and Process Consideration

- Rapid Deployment of Private Cloud Solution

- Ready for Hybrid Cloud and XaaS

Q & A

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