Data Center Design Playbook

February 2018 | Version 3.0

Executive Summary

Go to CVD sitemap

Visit DC Design Zone for the full and most current set of validated designs:
www.cisco.com/go/dcdesignzone

What are CVDs?

A Cisco Validated Design (CVD) is a specific bundle of products—Cisco products as well as products from our partners—designed to address the business needs of customers. The CVDs are created based on Cisco's observation of market trends and inside knowledge of future directions of Cisco and its partners. As a complete solution, each CVD consists of both hardware and software, and optimizes the capabilities of the Cisco components to maximize speed, performance, stability, and reliability of the CVD bundle.

Most importantly, each CVD has been extensively tested, validated, and documented. The CVDs were designed to facilitate faster, more reliable, and more predictable customer deployments and are guaranteed to work as specified.

The initial sections of this playbook are educational. You can browse through them to get up to speed on the market forces driving Cisco's United Computing System (UCS) value proposition and competitive differentiators, and to learn about the benefits of using CVD solutions.

What a CVD does:

- Provides a reference design for a system architecture (A reference design is a general design that applies to 60 to 80 percent of enterprise customers.)
- Documents a deployable system / architecture
- Provides design recommendations that compare different design options and trade-offs
- Includes the most common product scalability and performance recommendations
- Sets the "rules" for deploying a system with confidence

What a CVD does not do:

- Document a specific customer implementation
- Advocate a technology / system that is too early for deployment or one with major gaps
- Define how every Cisco product will perform in the system
- Provide product-specific performance limits (a.k.a. "drag strip" numbers)
- Act as a comprehensive troubleshooting guide

What's in it for customers?

Two words: *minimized risk.* There is always risk in any large-scale IT initiative, especially one that involves switching out hardware and networking equipment while implementing, migrating, or upgrading mission-critical applications.

There are two types of risk: *integration risk*, risk that products won't work together, and *performance risk*, risk that they won't perform as promised.

Using a CVD minimizes both these risks. CVDs are not simply an ad hoc group of products. Each CVD forms an integrated, tested, and documented solution. Like the reference architectures produced by other vendors, CVDs incorporate best-of-breed combinations of equipment and software to optimize the value of a configuration for a customer. But unlike reference architectures, CVDs are validated and supported. In most cases, multiple technical teams, from both Cisco and its partners, have put each CVD configuration through rigorous testing to ensure that all products work together to enable rapid deployment.

By implementing the solution presented in a CVD, you are guaranteed to have a successful deployment for the specific workload covered in the CVD. Of course, each specific workload may vary.

Cisco UCS Integrated Infrastructure Solutions

5-Year ROI
483%

5-Year Total Business Benefit per Organization
$13M

Break-Even Period
7 months

Key Performance Improvements Realized from Customers Who Deployed Cisco UCS Integrated Infrastructure

Lower IT Infrastructure Costs
46%

Reduction in Unplanned Downtime
89%

Reduction of Staff Time "Keeping the Lights on"
38%

Business Value Benefits – Average Annual Benefits per Organization over Five Years

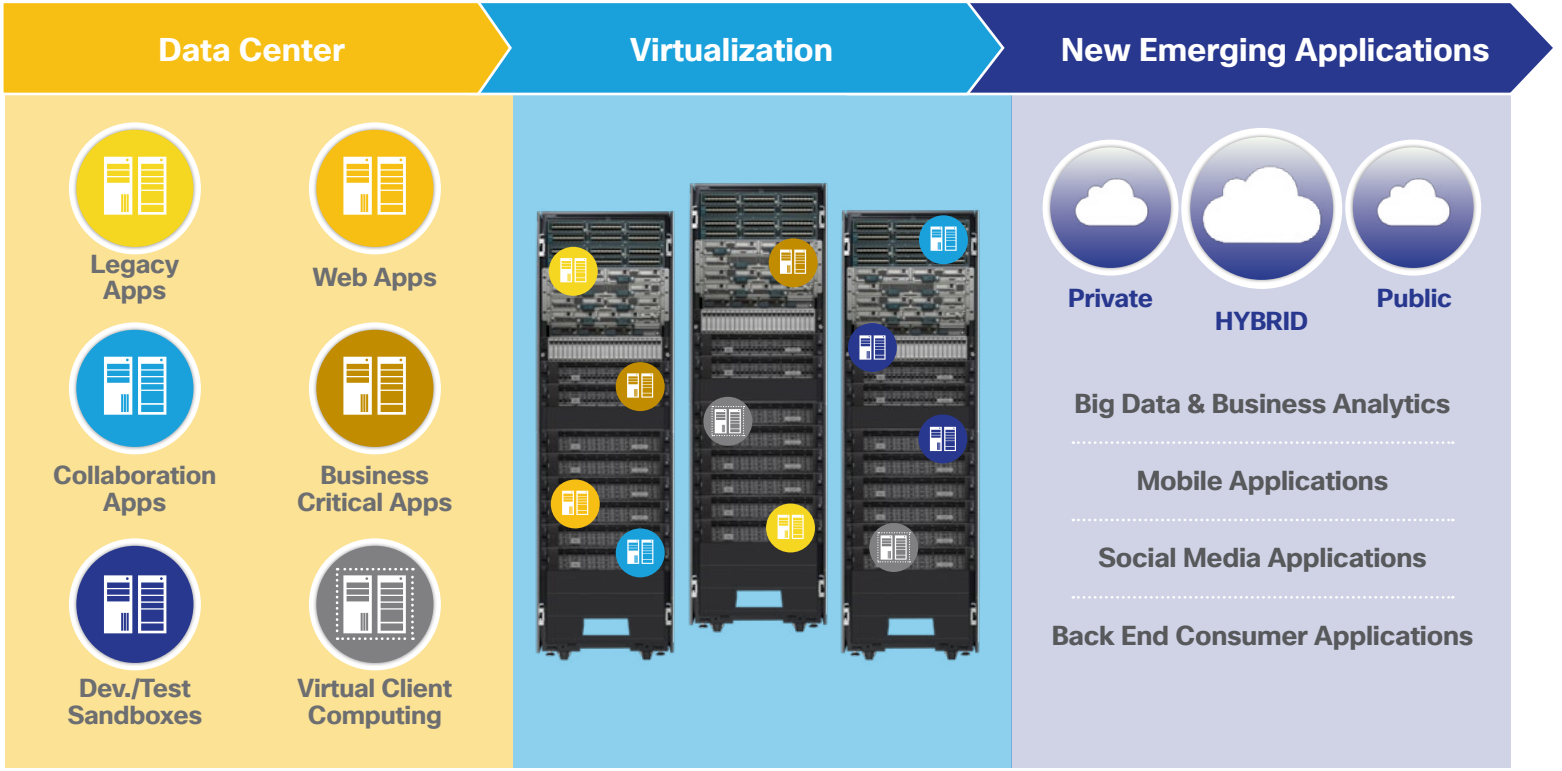
Business Productivity	User Productivity	IT Staff Productivity	IT Infrastructure Cost Reduction
$1.44M	$1M	$1.37M	$0.15M

Document # #US41066816

IDC Analyze the Future

Building Momentum: UCS Value Proposition

In today's data center, a broad range of applications need to coexist: legacy, web, collaboration, and business-critical applications, as well as test / development sandboxes and virtual client computing (VCC). All these applications are being virtualized, saving both operating expenses (OPEX) and capital expenditures (CAPEX). In addition, emerging applications need to be supported: Big Data and business analytics, and mobile, social media, and back-end consumer applications.



Benefits of UCS CVD Solutions

Here are just some of the reasons you should use CVDs:

Demonstrate best practices for deploying Cisco products

These tested solutions use all the best practices Cisco has internally identified for its products, as well the best practices recommended by Cisco partners. By following the instructions in a CVD design, customers can set performance expectations when they deploy their desired solution.

Provide much greater efficiency in deployment

Because CVDs provide everything—from designs to configuration instructions to bill of materials (BOMs)—enterprises require a much shorter time to deploy their solutions. Everything is clearly and precisely laid out; there are no surprises during the design phase. And because CVD solutions are guaranteed to work, Cisco provides 24/7 support for any issues that might arise.

Demonstrate Cisco's credibility and commitment to solutions

Cisco UCS CVDs are evidence that Cisco's recommended solutions are credible. They are proof of Cisco's commitment to these solutions and provide a viable path for enterprises that depend on the Cisco technology roadmap.

Offer flexibility through scalability options

Most Cisco UCS CVDs offer scalability options that allow customers to scale solutions to meet their specific needs. Customers still receive Cisco's CVD guarantees for performance, even if they choose to adjust the scale of the solution.

Using UCS CVD Solutions to Meet Business Needs

CVDs are innovative, proven solutions to help address the business needs of customers.

For implementations of Cisco solutions as infrastructure, CVDs can help customers realize optimal performance and optimization of Cisco UCS with hardware and software partners.

For implementations of Oracle, SAP, or other enterprise applications, CVDs incorporate Cisco's expertise in both applications and infrastructure to provide detailed guidance for installing a particular application or suite at both the hardware and software levels.

By providing demonstrated solutions along with success stories from other customers, CVDs give enterprises that are Cisco customers—but haven't yet shifted their servers to UCS—a level of confidence in the technology.

Benefits provided by CVDs

Cisco UCS CVDs provide customers with the following benefits:

- **Removes risks.** No one likes to be on the bleeding edge. CVDs show that the trail has been blazed. By providing tested solutions, CVDs remove the risk from using Cisco UCS in a broad range of deployment scenarios.
- **Proves Cisco is more than a networking vendor.** Although Cisco is predominantly a network provider, CVDs is proof that Cisco is also a provider of a viable server option, UCS.
- **Demonstrates possibilities.** Cisco has carefully calculated which products are put in each solution bundle based on its understanding of both customers' existing needs and the direction its technology partners are heading. Customers can use the CVDs as a jumping-off point to design solutions that meet their needs.
- **Bridges multiple partners.** If you have a customer account that has already standardized on a particular software or storage vendor, the CVDs show how well Cisco UCS works with partners like Oracle, Red Hat, NetApp, VMware, and others.

Potential shortcomings

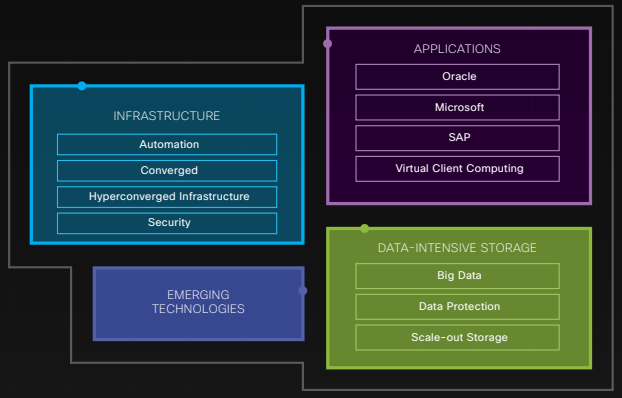
For all the benefits that CVDs provide, customers should be aware of a few potential shortcomings:

- **CVDs may not always be completely up-to-date.** The Cisco CVD teams can only work so fast,and thus, there is always newer code available that has not been validated. It's important to understand the difference between what is supported and what has been validated.
- **CVDs probably won't precisely match a customer's needs.** The chances that a CVD will meet a customer's complete requirements are slim. Instead, CVDs can be used as a jumping-off point to discuss designs that do fully match the customer's needs.

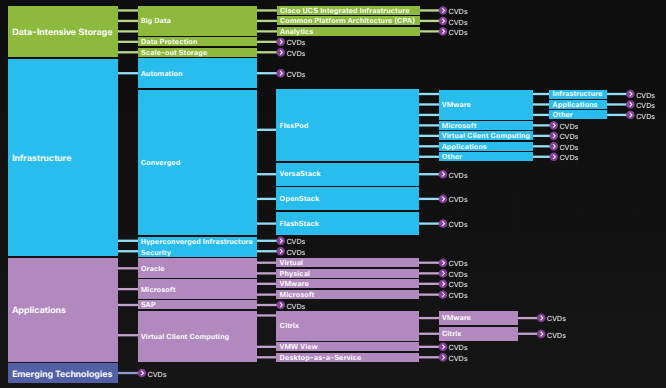
Let's Get Started

Welcome to the DC Design library. Click on a section below or the icons in the top header to see different tours of the CVDs.

Library View



Sitemap View



Outline View

DATA-INTENSIVE STORAGE

A. Big Data

1. Cisco UCS Integrated Infrastructure

- Cisco UCS Petabyte-Scale Solution for Splunk Enterprise
- Cisco UCS S3260 Storage Server with Cloudera Enterprises
- Cisco UCS S3260 Storage Server with Hortonworks Data Platform
- Cisco UCS S3260 Storage Server with MapR Converged Data Platform
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Real-time Analytics
- Cisco UCS Integrated Infrastructure for Big Data with SAP HANA Vora
- Cisco UCS Integrated Infrastructure for SAP HANA
- Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI
- Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apach Hadoop
- Cisco UCS Integrated Infrastructure with ACI and Cloudera
- Cisco UCS Integrated Infrastructure with Hortonworks
- Cisco UCS Integrated Infrastructure with MapR
- Cisco UCS Integrated Infrastructure with Splunk Enterprise

2. Common Platform Architecture (CPA)

- Big Data 60 node Hadoop Cluster with EMC Isilon
- Big Data Cisco ACI with Cloudera
- Cisco UCS CPAv2 for Big Data with Cloudera
- Cisco UCS CPAv2 for Big Data with Hortonworks
- HaaS with Cisco UCS CPAv2 for Big Data and OpenStack
- Cisco UCS CPAv2 for Big Data with Intel Distribution
- Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ

3. Analytics

- Cisco SAS Edge to Enterprise IOT Analytics Platform

Alphabetical View

1

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 (Infrastructure, Applications) - ***New***

2

2000 Seat DaaS for Service Provider Virtual Client Computing (VCC) with Citrix
2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2 (Infrastructure, Applications)
2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1 (Infrastructure, Applications)

4

4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

5

5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2 (Infrastructure, Applications)
5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2 (Infrastructure, Applications)

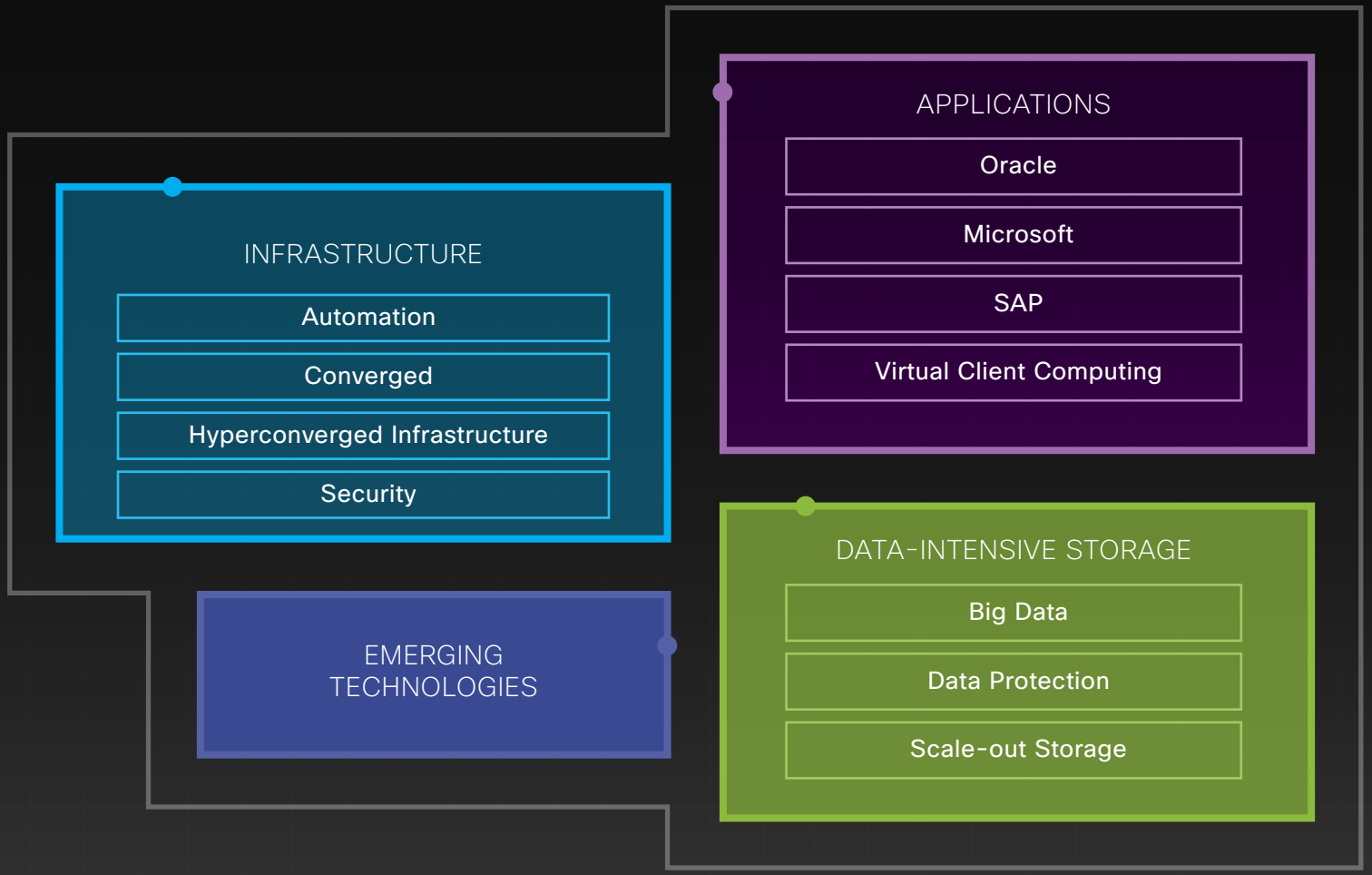
B

Big Data 60 node Hadoop Cluster with EMC Isilon
Big Data Cisco ACI with Cloudera

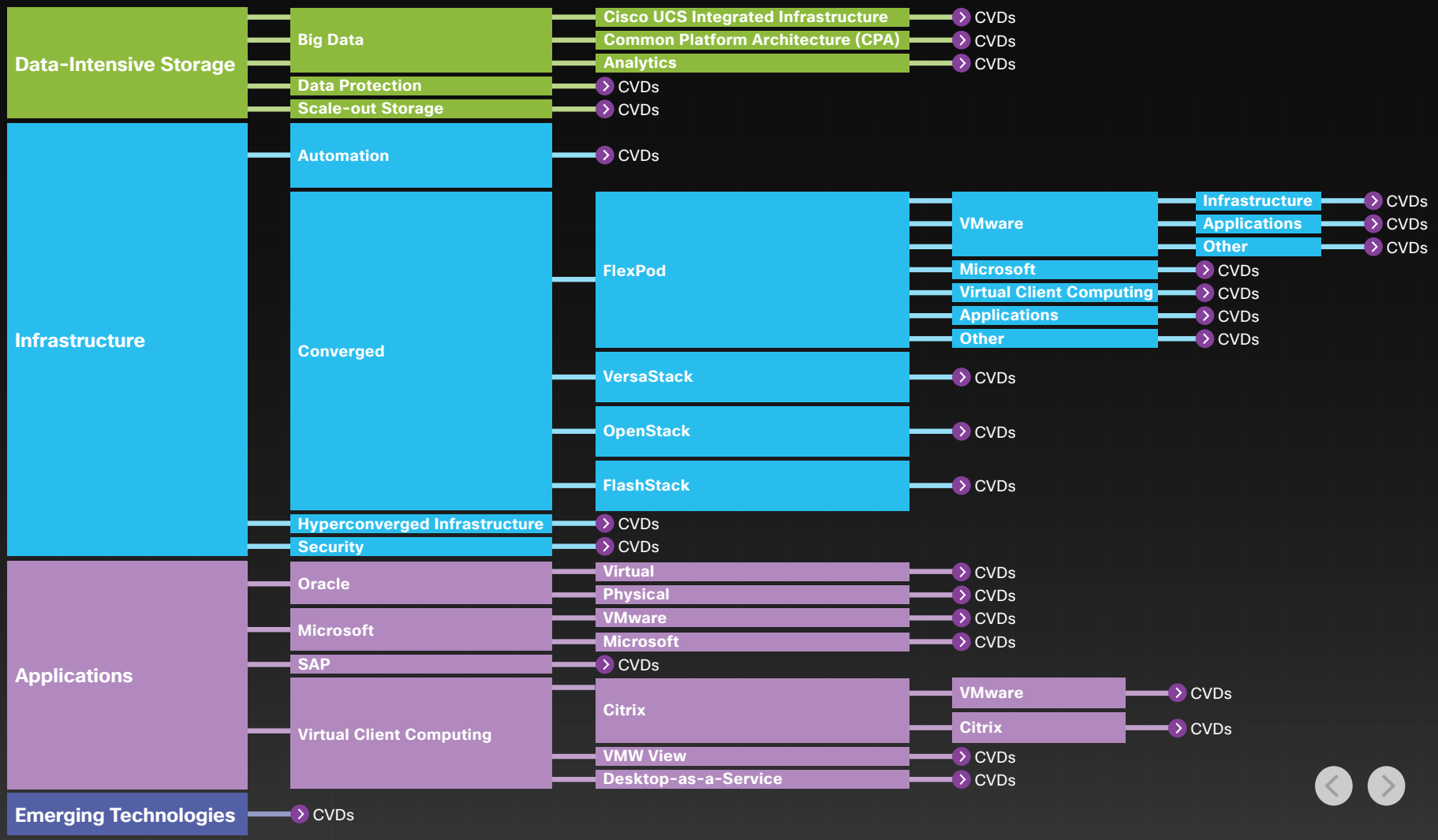
C

Cisco DaaS Solution with Desktone
Cisco HyperFlex 2.5 for Virtual Server Infrastructure - ***New***
Cisco HyperFlex 2.6 for Virtual Server Infrastructure - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users (Infrastructure, Applications) - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users (Infrastructure, Applications) - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users (Infrastructure, Applications) - ***New***
Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage
Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users (Infrastructure, Applications)
Cisco HyperFlex Virtual Server Infrastructure
Cisco HyperFlex with Veeam Availability Suite
Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments (Data-Intensive Storage, Infrastructure) - ***New***
Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment (Data-Intensive, Infrastructure)

Data Center Design Library



DC Design Sitemap



CVD Outline

DATA-INTENSIVE STORAGE

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Cisco UCS Integrated Infrastructure for SAP HANA
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Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apach Hadoop
Cisco UCS Integrated Infrastructure with ACI and Cloudera
Cisco UCS Integrated Infrastructure with Hortonworks
Cisco UCS Integrated Infrastructure with MapR
Cisco UCS Integrated Infrastructure with Splunk Enterprise

2. Common Platform Architecture (CPA)

Big Data 60 node Hadoop Cluster with EMC Isilon
Big Data Cisco ACI with Cloudera
Cisco UCS CPAv2 for Big Data with Cloudera
Cisco UCS CPAv2 for Big Data with Hortonworks
HaaS with Cisco UCS CPAv2 for Big Data and OpenStack
Cisco UCS CPAv2 for Big Data with Intel Distribution
Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ

3. Analytics

Cisco SAS Edge to Enterprise IOT Analytics Platform

CVD Outline

DATA-INTENSIVE STORAGE (CONT.)

B. Data Protection

Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments - ***New***
Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment
FlashStack VSI with Commvault for Data Protection

C. Scale-Out Storage

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage - ***New***
Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage - ***New***
Cisco UCS S3260 Storage Server with Red Hat Ceph Storage
Cisco UCS Storage Server with Scality Ring

CVD Outline

INFRASTRUCTURE

A. Automation

VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution - ***New***
FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 - ***New***
Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI
FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)
FlexPod with Cisco UCS Director and Nexus 9000 Standalone
VersaStack for Data Center with Cisco UCS Director

B. Converged

1. FlexPod

a. VMware

I. Infrastructure

FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and Fibre Channel
FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and IP-Based Storage
FlexPod Datacenter with Cisco ACI and VMware 6.0U1
FlexPod Datacenter with Cisco UCS 6300 Fabric Interconnect and VMware vSphere 6.0 U1
FlexPod Datacenter with VMware vSphere 6.0 and Fiber Channel
FlexPod Datacenter with Cisco UCS Mini and VMware vSphere 6.0 with IP-Based Storage
FlexPod with All Flash FAS, Cisco ACI and vSphere 5.5U2
FlexPod Datacenter with VMware vSphere 6.0
FlexPod Datacenter with vSphere 5.5 Cisco UCS Mini and IP-Based Storage
FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI
FlexPod with Cisco UCS Director and Nexus 9000 Standalone
FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1
FlexPod Datacenter with vSphere 5.5U1
FlexPod Datacenter with vSphere 5.1U1 and Cisco Nexus 9000 ACI

CVD Outline

INFRASTRUCTURE (CONT.)

I. Infrastructure(cont.)

vSphere 5.1 on FlexPod with the Nexus 7000
vSphere 5.1 on FlexPod with Nexus 7000 using FCoE
Multisite FlexPod with Nexus 7000 and NetApp MetroCluster
vSphere 5.1U1 Built on FlexPod
vSphere 5.1U1 Built on FlexPod with Nexus 6000

II. Applications

FlexPod Datacenter for SAP Solution with Cisco ACI
FlexPod with Microsoft Exchange 2013 on Cisco ACI
Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod

III. Other

FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI
FlexPod with Cisco UCS Director and Nexus 9000 Standalone

b. Microsoft

FlexPod with UCS Mini
FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0
FlexPod Datacenter with Microsoft Private Cloud Fast Track 3.0

c. Virtual Client Computing

FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

d. Applications

FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series - ***New***

CVD Outline

INFRASTRUCTURE (CONT.)

d. Applications (cont.)

FlexPod with Microsoft Exchange 2013 on Cisco ACI
Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
FlexPod Datacenter for SAP HANA with Nexus 9000
FlexPod with Oracle RAC
Oracle JD Edwards on FlexPod

e. Other

FlexPod Datacenter for Hybrid Cloud with Cisco CloudCenter and NetApp Private Storage - ***New***
FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 - ***New***
FlexPod Datacenter with Oracle RAC on Oracle Linux
FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0
FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1

2. VersaStack

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage - ***New***
VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution - ***New***
VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
VersaStack Data Center with Cisco Application Centric Infrastructure
VersaStack with Cisco Application Centric Infrastructure and IBM SAN Volume Controller
VersaStack with Cisco UCS Mini and VMware vSphere 6.0 U2 with Direct Attached SAN Storage
VersaStack with IBM Storwize v5000 and Cisco UCS Mini
VersaStack for Data Center with All Flash Storage
VersaStack for Data Center Scale-out
VersaStack for Data Center with Cisco UCS Director
VersaStack for Data Center with Direct Attached Storage
VersaStack Integrated Infrastructure

CVD Outline

INFRASTRUCTURE (CONT.)

3. OpenStack

Cisco UCS Integrated Infrastructure with Red Hat OpenStack Platform 8 and Red Hat Ceph Storage - ***New***
Cisco UCS Integrated Infrastructure with Red Hat Enterprise Linux OpenStack Platform and Red Hat Ceph Storage 7.0
FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0

4. FlashStack

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 - ***New***
FlashStack Data Center with Oracle RAC 12cR2 Database - ***New***
FlashStack for SAP HANA TDI
FlashStack for Oracle 12c RAC on Oracle Linux
FlashStack VSI with Commvault for Data Protection
5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2
5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
FlashStack Data Center with Oracle RAC on Oracle Linux
FlashStack Virtual Server Infrastructure

C. Hyperconverged Infrastructure

Cisco HyperFlex 2.6 for Virtual Server Infrastructure - ***New***
Cisco HyperFlex 2.5 for Virtual Server Infrastructure - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users - ***New***
Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments - ***New***
SQL Server on HyperFlex All Flash
Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage
Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment

CVD Outline

INFRASTRUCTURE (CONT.)

C. Hyperconverged Infrastructure (cont.)

Cisco HyperFlex Virtual Server Infrastructure
Cisco HyperFlex with Veeam Availability Suite

D. Security

Secure Enclave Architecture

CVD Outline

APPLICATIONS

A. Oracle

1. Virtual

- FlexPod Datacenter with Oracle RAC on Oracle Linux
- FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1
- Oracle JD Edwards on UCS / EMC VNX with Oracle VM

2. Physical Server

- FlashStack Data Center with Oracle RAC 12cR2 Database - ***New***
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack Data Center with Oracle RAC on Oracle Linux
- Oracle RAC 11gR2 with Oracle Linux 6.4 on Hitachi VSP G1000
- FlexPod with Oracle RAC
- Oracle JD Edwards on FlexPod
- Oracle Siebel on UCS / EMC VNX
- Oracle PeopleSoft on Cisco UCS and EMC VNX Storage
- Oracle 12c RAC on Cisco UCS and EMC VNX 8000

B. Microsoft

1. VMware

- Microsoft SharePoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod with Microsoft Exchange 2013 on Cisco ACI

2. Microsoft

- Microsoft SharePoint 2010 with Microsoft Hyper-V on Cisco UCS Rack-Mount Servers

C. SAP

- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series - ***New***
- FlashStack for SAP HANA TDI

CVD Outline

APPLICATIONS (CONT.)

C. SAP (cont.)

Cisco UCS Integrated Infrastructure for SAP HANA
Cisco UCS Integrated Infrastructure Solutions for SAP Applications with EMC Storage
FlexPod Datacenter for SAP Solution with Cisco ACI
FlexPod Datacenter for SAP HANA with Nexus 9000

D. Virtual Client Computing

1. Citrix

a. VMware

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users - ***New***
FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

b. Citrix

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 - ***New***
5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

2. VMW View

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users - ***New***
Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users - ***New***
Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2

3. Desktop-as-a-Service (DaaS)

2000 Seat DaaS for Service Provider Virtual Client Computing (VCC) with Citrix
Cisco DaaS Solution with Desktone

CVD Outline

EMERGING TECHNOLOGIES

Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management – ***New***
Cisco UCS Infrastructure with Docker Datacenter for Container Management
FlexPod Datacenter with Docker Datacenter for Container Management

Alphabetical CVDs

1

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 (Infrastructure, Applications) - ***New***

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4

4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

5

5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2 (Infrastructure, Applications)
5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2 (Infrastructure, Applications)

B

Big Data 60 node Hadoop Cluster with EMC Isilon
Big Data Cisco ACI with Cloudera

C

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Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments (Data-Intensive Storage, Infrastructure) - ***New***
Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment (Data-Intensive, Infrastructure)

1 B M
2 C O
4 F S
5 H V

Alphabetical CVDs

1 B M
2 C O
4 F S
5 H V

C

Cisco SAS Edge to Enterprise IoT Analytics Platform
Cisco UCS CPAv2 for Big Data with Cloudera
Cisco UCS CPAv2 for Big Data with Hortonworks
Cisco UCS CPAv2 for Big Data with Intel Distribution
Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ
Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management - ***New***
Cisco UCS Infrastructure with Docker Datacenter for Container Management
Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Real-time Analytics
Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apach Hadoop
Cisco UCS Integrated Infrastructure for Big Data with SAP HANA Vora
Cisco UCS Integrated Infrastructure for SAP HANA (Data-Intensive Storage, Applications)
Cisco UCS Integrated Infrastructure Solutions for SAP Applications with EMC Storage
Cisco UCS Integrated Infrastructure with ACI and Cloudera
Cisco UCS Integrated Infrastructure with Hortonworks
Cisco UCS Integrated Infrastructure with MapR
Cisco UCS Integrated Infrastructure with Red Hat Enterprise Linux OpenStack Platform and Red Hat Ceph Storage 7.0
Cisco UCS Integrated Infrastructure with Red Hat OpenStack Platform 8 and Red Hat Ceph Storage - ***New***
Cisco UCS Integrated Infrastructure with Splunk Enterprise
Cisco UCS Petabyte-Scale Solution for Splunk Enterprise
Cisco UCS S3260 Storage Server with Cloudera Enterprises
Cisco UCS S3260 Storage Server with Hortonworks Data Platform
Cisco UCS S3260 Storage Server with IBM Cloud Object Storage (Data-Intensive Storage, Infrastructure) - ***New***
Cisco UCS S3260 Storage Server with MapR Converged Data Platform
Cisco UCS S3260 Storage Server with Red Hat Ceph Storage
Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage - ***New***
Cisco UCS Storage Server with Scality Ring

Alphabetical CVDs

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5 H V

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FlashStack VSI with Commvault for Data Protection (Data-Intensive Storage, Infrastructure)
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FlexPod Datacenter for SAP Solution with Cisco ACI (Infrastructure, Applications)
FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series (Infrastructure, Applications) - ***New***
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FlexPod Datacenter with Docker Datacenter for Container Management
FlexPod Datacenter with Microsoft Private Cloud Fast Track 3.0
FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0
FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1
FlexPod Datacenter with Oracle RAC on Oracle Linux
FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0
FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
FlexPod Datacenter with VMware vSphere 6.0
FlexPod Datacenter with VMware vSphere 6.0 and Fiber Channel
FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and Fibre Channel

Alphabetical CVDs

F

FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and IP-Based Storage
FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI (Infrastructure - Automation, Infrastructure - Converged)
FlexPod Datacenter with vSphere 5.1U1 and Cisco Nexus 9000 ACI
FlexPod Datacenter with vSphere 5.5 Cisco UCS Mini and IP-Based Storage
FlexPod Datacenter with vSphere 5.5U1
FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6 (Infrastructure, Applications)
FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 (Infrastructure - Automation, Infrastructure - Converged) - ***New***
FlexPod with All Flash FAS, Cisco ACI and vSphere 5.5U2
FlexPod with Cisco UCS Director and Nexus 9000 Standalone (Infrastructure - Automation, Infrastructure - Converged)
FlexPod with Microsoft Exchange 2013 on Cisco ACI (Infrastructure, Applications)
FlexPod with Oracle RAC (Infrastructure, Applications)
FlexPod with UCS Mini

H

HaaS with Cisco UCS CPAv2 for Big Data and OpenStack
Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS
Integrated Infrastructure for Big Data and Cisco ACI (Data-Intensive Storage, Infrastructure)

M

Microsoft SharePoint 2010 with Microsoft Hyper-V on Cisco UCS Rack-Mount Servers
Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod (Infrastructure, Applications)
Multisite FlexPod with Nexus 7000 and NetApp MetroCluster

O

Oracle 12c RAC on Cisco UCS and EMC VNX 8000
Oracle JD Edwards on FlexPod (Infrastructure, Applications)
Oracle JD Edwards on UCS / EMC VNX with Oracle VM
Oracle PeopleSoft on Cisco UCS and EMC VNX Storage

1 B M
2 C O
4 F S
5 H V

Alphabetical CVDs

O

- Oracle RAC 11gR2 with Oracle Linux 6.4 on Hitachi VSP G1000
- Oracle Siebel on UCS / EMC VNX

S

- Secure Enclave Architecture
- SQL Server on HyperFlex All Flash

V

- VersaStack Data Center with Cisco Application Centric Infrastructure
- VersaStack for Data Center Scale-out
- VersaStack for Data Center with All Flash Storage
- VersaStack for Data Center with Cisco UCS Director (Infrastructure - Automation, Infrastructure - Converged)
- VersaStack for Data Center with Direct Attached Storage
- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution (Infrastructure - Automation, Infrastructure - Converged) - ***New***
- VersaStack Integrated Infrastructure
- VersaStack with Cisco Application Centric Infrastructure and IBM SAN Volume Controller
- VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users (Infrastructure, Applications)
- VersaStack with Cisco UCS Mini and VMware vSphere 6.0 U2 with Direct Attached SAN Storage
- VersaStack with IBM Storwize v5000 and Cisco UCS Mini
- vSphere 5.1 on FlexPod with Nexus 7000 using FCoE
- vSphere 5.1 on FlexPod with the Nexus 7000
- vSphere 5.1U1 Built on FlexPod
- vSphere 5.1U1 Built on FlexPod with Nexus 6000

1 B M
2 C O
4 F S
5 H V

Data-Intensive Storage | BIG DATA

Cisco UCS Integrated Infrastructure

- Cisco UCS Petabyte-Scale Solution for Splunk Enterprise
- Cisco UCS S3260 Storage Server with Cloudera Enterprises
- Cisco UCS S3260 Storage Server with Hortonworks Data Platform
- Cisco UCS S3260 Storage Server with MapR Converged Data Platform
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Real-time Analytics
- Cisco UCS Integrated Infrastructure for Big Data with SAP HANA Vora
- Cisco UCS Integrated Infrastructure for SAP HANA
- Hadoop as a Service on BareMetal with UCS Diretor Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI
- Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apach Hadoop
- Cisco UCS Integrated Infrastructure with Application Centric Infrastructure (ACI) and Cloudera
- Cisco UCS Integrated Infrastructure with Hortonworks
- Cisco UCS Integrated Infrastructure with MapR
- Cisco UCS Integrated Infrastructure with Splunk Enterprise

Data-Intensive Storage | BIG DATA

Common Platform Architecture (CPA)

- Big Data 60 node Hadoop Cluster with EMC Isilon
- Big Data Cisco Application Centric Infrastructure (ACI) with Cloudera
- Cisco UCS CPAv2 for Big Data with Cloudera
- Cisco UCS CPAv2 for Big Data with Hortonworks
- Hadoop-as-a-Service (HaaS) with Cisco UCS CPA v2 for Big Data and OpenStack
- Cisco UCS CPAv2 for Big Data with Intel Distribution
- Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ

Analytics

- Cisco SAS Edge to Enterprise IoT Analytics Platform

Data-Intensive Storage | DATA PROTECTION

Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments

- New

Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment

FlashStack VSI with Commvault for Data Protection

Data-Intensive Storage | SCALE-OUT STORAGE

- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage - New
- Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage - New
- Cisco UCS S3260 Storage Server with Red Hat Ceph Storage
- Cisco UCS Storage Server with Scality Ring

Infrastructure | AUTOMATION

VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution - *New*

FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 - *New*

Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI

FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)

FlexPod with Cisco UCS Director and Nexus 9000 Standalone

VersaStack for Data Center with Cisco UCS Director

Infrastructure | CONVERGED | FLEXPOD

VMware

Infrastructure
Applications
Other

- FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and Fibre Channel
- FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and IP-Based Storage
- FlexPod Datacenter with Cisco ACI and VMware 6.0U1
- FlexPod Datacenter with Cisco UCS 6300 Fabric Interconnect and VMware vSphere 6.0 U1
- FlexPod Datacenter with VMware vSphere 6.0 and Fiber Channel
- FlexPod Datacenter with Cisco UCS Mini and VMware vSphere 6.0 with IP-Based Storage
- FlexPod with All Flash FAS, Cisco ACI and vSphere 5.5U2
- FlexPod Datacenter with VMware vSphere 6.0
- FlexPod Datacenter with vSphere 5.5 Cisco UCS Mini and IP-Based Storage
- FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI
- FlexPod with Cisco UCS Director and Nexus 9000 Standalone
- FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1
- FlexPod Datacenter with vSphere 5.5U1
- FlexPod Datacenter with vSphere 5.1U1 and Cisco Nexus 9000 ACI
- vSphere 5.1 on FlexPod with the Nexus 7000
- vSphere 5.1 on FlexPod with Nexus 7000 using FCoE
- Multisite FlexPod with Nexus 7000 and NetApp MetroCluster
- vSphere 5.1U1 Built on FlexPod
- vSphere 5.1U1 Built on FlexPod with Nexus 6000

- FlexPod Datacenter for SAP Solution with Cisco ACI
- FlexPod with Microsoft Exchange 2013 on Cisco ACI
- Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI
- FlexPod with Cisco UCS Director and Nexus 9000 Standalone

Infrastructure | CONVERGED | FLEXPOD

Microsoft

- FlexPod with UCS Mini
- FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0
- FlexPod Datacenter with Microsoft Private Cloud Fast Track 3.0

Virtual Client Computing

- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
- FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
- 2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
- 2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

Applications

- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series *- New*
- FlexPod with Microsoft Exchange 2013 on Cisco ACI
- Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod Datacenter for SAP HANA with Nexus 9000
- FlexPod with Oracle RAC
- Oracle JD Edwards on FlexPod

Other

- FlexPod Datacenter for Hybrid Cloud with Cisco CloudCenter and NetApp Private Storage *- New*
- FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 *- New*
- FlexPod Datacenter with Oracle RAC on Oracle Linux
- FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0
- FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1

Infrastructure | CONVERGED

VersaStack

- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage - *New*
- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution - *New*
- VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
- VersaStack Data Center with Cisco Application Centric Infrastructure
- VersaStack with Cisco Application Centric Infrastructure and IBM SAN Volume Controller
- VersaStack with Cisco UCS Mini and VMware vSphere 6.0 U2 with Direct Attached SAN Storage
- VersaStack with IBM Storwize v5000 and Cisco UCS Mini
- VersaStack for Data Center with All Flash Storage
- VersaStack for Data Center Scale-out
- VersaStack for Data Center with Cisco UCS Director
- VersaStack for Data Center with Direct Attached Storage
- VersaStack Integrated Infrastructure

Infrastructure | CONVERGED

OpenStack

- Cisco UCS Integrated Infrastructure with Red Hat OpenStack Platform 8 and Red Hat Ceph Storage - *New*
- Cisco UCS Integrated Infrastructure with Red Hat Enterprise Linux OpenStack Platform and Red Hat Ceph Storage 7.0
- FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0

FlashStack

- 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 - *New*
- FlashStack Data Center with Oracle RAC 12cR2 Database - *New*
- FlashStack for SAP HANA TDI
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack VSI with Commvault for Data Protection
- 5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
- FlashStack Data Center with Oracle RAC on Oracle Linux
- FlashStack Virtual Server Infrastructure

Infrastructure | HYPERCONVERGED INFRASTRUCTURE

- Cisco HyperFlex 2.6 for Virtual Server Infrastructure - New
- Cisco HyperFlex 2.5 for Virtual Server Infrastructure - New
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users - New
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users - New
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users - New
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments - New
- SQL Server on HyperFlex All Flash
- Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage
- Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
- Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment
- Cisco HyperFlex Virtual Server Infrastructure
- Cisco HyperFlex with Veeam Availability Suite

Infrastructure | SECURITY

Secure Enclave Architecture

Applications | ORACLE

Virtual

- FlexPod Datacenter with Oracle RAC on Oracle Linux
- FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1
- Oracle JD Edwards on UCS / EMC VNX with Oracle VM

Physical Server

- FlashStack Data Center with Oracle RAC 12cR2 Database ***- New***
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack Data Center with Oracle RAC on Oracle Linux
- Oracle RAC 11gR2 with Oracle Linux 6.4 on Hitachi VSP G1000
- FlexPod with Oracle RAC
- Oracle JD Edwards on FlexPod
- Oracle Siebel on UCS / EMC VNX
- Oracle PeopleSoft on Cisco UCS and EMC VNX Storage
- Oracle 12c RAC on Cisco UCS & EMC VNX 8000

Applications | MICROSOFT

VMware

- Microsoft SharePoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod with Microsoft Exchange 2013 on Cisco ACI

Microsoft

- Microsoft SharePoint 2010 with Microsoft Hyper-V on Cisco UCS Rack-Mount Servers

Applications | SAP

- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series - *New*
- FlashStack for SAP HANA TDI
- Cisco UCS Integrated Infrastructure for SAP HANA
- Cisco UCS Integrated Infrastructure Solutions for SAP Applications with EMC Storage
- FlexPod Datacenter for SAP Solution with Cisco ACI
- FlexPod Datacenter for SAP HANA with Nexus 9000

Applications | VIRTUAL CLIENT COMPUTING

Citrix

VMware

- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users - *New*
- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/ XenDesktop 7.7
- FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
- 2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
- 4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

Citrix

- 1250 Users on FlashStack a Cisco UCS Mini and Pure // m10, with Citrix XenDesktop and XenApp 7.15 - *New*
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
- 2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

VMW View

- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users - *New*
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users - *New*
- Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
- VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
- 5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2

Desktop-as-a-Service (DaaS)

- 2000 Seat Desktop-as-a-Service (DaaS) for Service Provider Virtual Client Computing (VCC) with Citrix
- Cisco Desktop-as-a-Service (DaaS) Solution with Desktone

Emerging Technologies

Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management - *New*

Cisco UCS Infrastructure with Docker Datacenter for Container Management

FlexPod Datacenter with Docker Datacenter for Container Management

Data-Intensive Storage

BIG DATA

Cisco UCS Integrated Infrastructure

- Cisco UCS Petabyte-Scale Solution for Splunk Enterprise
- Cisco UCS S3260 Storage Server with Cloudera Enterprises
- Cisco UCS S3260 Storage Server with Hortonworks Data Platform
- Cisco UCS S3260 Storage Server with MapR Converged Data Platform
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Real-time Analytics
- Cisco UCS Integrated Infrastructure for Big Data with SAP HANA Vora
- Cisco UCS Integrated Infrastructure for SAP HANA
- Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI
- Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apach Hadoop
- Cisco UCS Integrated Infrastructure with Application Centric Infrastructure (ACI) and Cloudera
- Cisco UCS Integrated Infrastructure with Hortonworks
- Cisco UCS Integrated Infrastructure with MapR
- Cisco UCS Integrated Infrastructure with Splunk Enterprise

The Big Data market continues to explode. Industry analysts project that it will exceed $210 billion by 2020, with a whopping compound annual growth rate (CAGR) of 11.9 percent. These estimates include hardware, software, and services revenue. Source: IDC

Cisco UCS Petabyte-Scale Solution for Splunk Enterprise

TECHNICAL HIGHLIGHTS

- Peta-byte scale Splunk solution (ITOA, ES and ITSI) on S-series
- Tiered storage comes standard: SSDs for HOT+WARM data and HDDs for COLD & Frozen
- Scales up to 8.9PB in single UCS domain

SUMMARY

- Powered by Cisco UCS S-series Storage Servers, Splunk real-time collection and indexing of machine data, and distributed high capacity and performance architecture

BUSINESS CHALLENGES

- Scale horizontally while continuously delivering exceptional performance
- Highly scalable infrastructure ensuring rapid and predictable delivery of insights
- Optimize application and infrastructure performance

ARCHITECTURE

Network Fabric:
· Two Cisco UCS Fabric Interconnects 6332
· 32 40 Gigabit-Ethernet ports

Search Head Servers:
Three Cisco UCS C220 M4 Servers with:
· 28 cores, 256 GB RAM

Total Storage:
· Hot/Warm Tier: 88-TB
· Cold Tier: 800-TB

A single UCS domain can accomodate:
· 25 indexers
· 275 TB of Hot/Warm storage
· 2.5 PB of Cold storage

Admin Servers:
Two Cisco UCS C220 M4 Servers with:
· Splunk cluster master, deployer
· DMC, License Master, Deployment server

Indexers:
Four Cisco UCS S3260 Storage Servers with:
· Two processing node (per server) with
· 28 cores (total 56 cores)
· 16 SSDs for HOT/WARM, 40HDDs for COLD tiers
· 4 40 Gigabit Ethernet ports

Total Storage:
· Hot/Warm Tier:88-TB
· Cold Tier: 800-TB

Indexing Capacity:
· Up to 2.4 terabytes (TB) per day
· HOT/WARM: 30 days (1 month)
· COLD:300 days (10 months)

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Petabyte_Scale_Solution_for_Splunk_Enterprise.pdf
Solution: http://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/le-44701-sb-splunk.pdf

Cisco UCS S3260 Storage Server with Cloudera Enterprise

TECHNICAL HIGHLIGHTS

Configuration Details

- 2 Cisco UCS 6332 Fabric Interconnects

8 Cisco UCS S3260 Storage Servers, each with 2 nodes with:

- 2 Intel Xeon processor
- E5-2680 v4 CPUs(14 cores on each CPU)
- 256 GB of memory
- Cisco 12-Gbps SAS Modular RAID Controller with 4-GB FBWC
- 24 x 4-TB 7200-rpm LFF SAS drives(1.54 petabytes [PB] total)
- 2 x 480-GB 6-Gbps 2.5-inch enterprise value SATA SSD drives for boot
- Cisco UCS VIC 1387 (with 2 x 40 Gigabit Ethernet QSFP ports)

** 3 Cisco UCS C240 M4, as master nodes

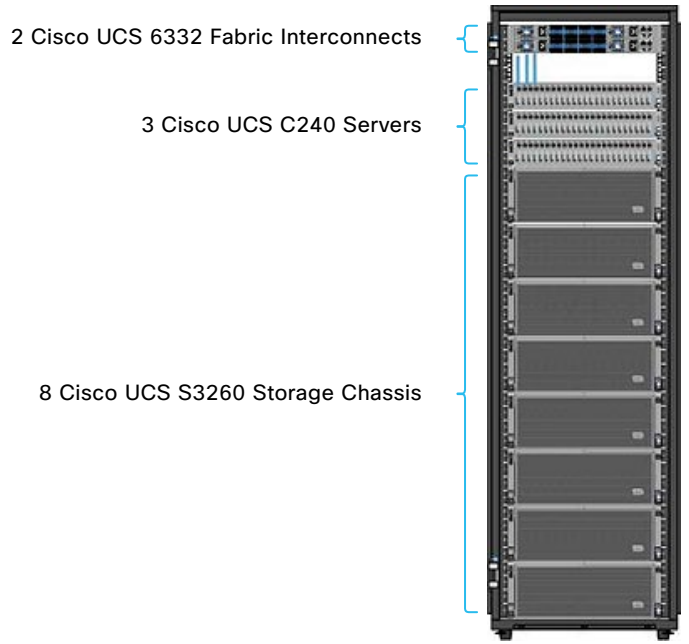
BUSINESS CHALLENGES

- Bringing flexibility and scalability to dense storage for Big Data
- Flexible modular architecture to handle both high performance and high capacity workloads

SUMMARY

- Flexible Big Data platform powering the enterprise data hub with Cloudera Enterprise

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_S3260_Storage_Server_with_Cloudera_Enterprise_Data_Hub.pdf

Cisco UCS S3260 Storage Server with Hortonworks Data Platform

TECHNICAL HIGHLIGHTS

Configuration Details

- 2 Cisco UCS 6332 Fabric Interconnects

8 Cisco UCS S3260 Storage Servers, each with 2 nodes with:

- 2 Intel Xeon processor
- E5-2680 v4 CPUs(14 cores on each CPU)
- 256 GB of memory
- Cisco 12-Gbps SAS Modular RAID Controller with 4-GB FBWC
- 24 x 4-TB 7200-rpm LFF SAS drives(1.54 petabytes [PB] total)
- 2 x 480-GB 6-Gbps 2.5-inch enterprise value SATA SSD drives for boot
- Cisco UCS VIC 1387 (with 2 x 40 Gigabit Ethernet QSFP ports)

** 3 Cisco UCS C240 M4, as master nodes

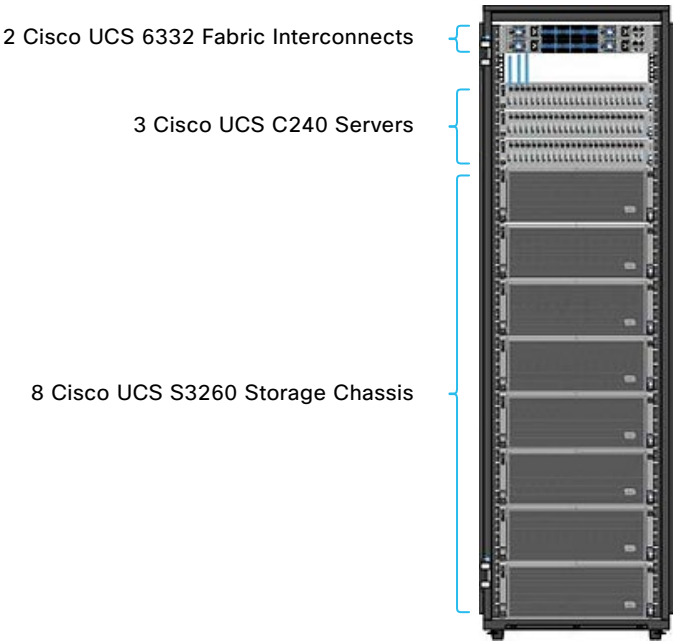
BUSINESS CHALLENGES

- Bringing flexibility and scalability to dense storage for Big Data
- Flexible modular architecture to handle both high performance and high capacity workloads

SUMMARY

- Enterprise data lake using Cisco UCS S3260 Storage Server with Hortonworks Data Platform

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_S3260_Storage_Server_with_Hortonworks_Data_Platform_final.pdf

Cisco UCS S3260 Storage Server with MapR Converged Data Platform

TECHNICAL HIGHLIGHTS

Configuration Details

- 2 Cisco UCS 6332 Fabric Interconnects

8 Cisco UCS S3260 Storage Servers, each with 2 nodes with:

- 2 Intel Xeon processor
- E5-2680 v4 CPUs(14 cores on each CPU)
- 256 GB of memory
- Cisco 12-Gbps SAS Modular RAID Controller with 4-GB FBWC
- 24 x 4-TB 7200-rpm LFF SAS drives(1.54 petabytes [PB] total)
- 2 x 480-GB 6-Gbps 2.5-inch enterprise value SATA SSD drives for boot
- Cisco UCS VIC 1387 (with 2 x 40 Gigabit Ethernet QSFP ports)

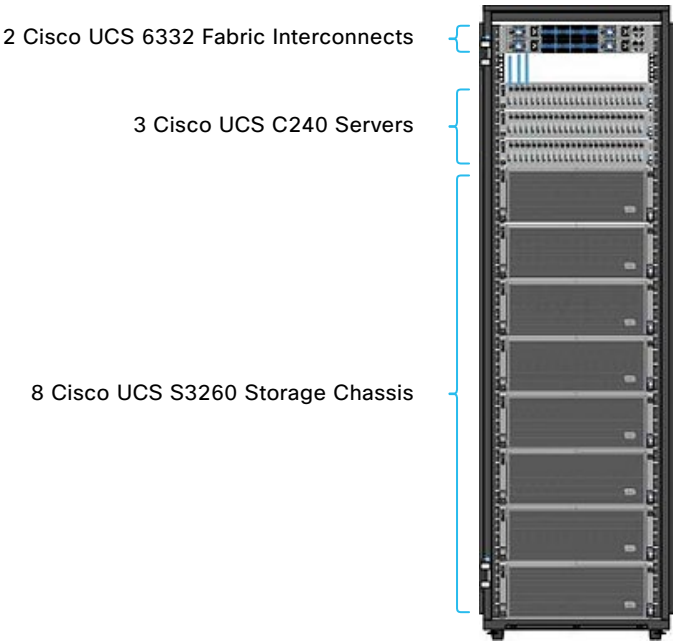
BUSINESS CHALLENGES

- Bringing flexibility and scalability to dense storage for Big Data
- Flexible modular architecture to handle both high performance and high capacity workloads

SUMMARY

- Comprehensive integrated infrastructure for Big Data with MapR Converged Data Platform

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_S3260_Storage_Server_with_MapR_Converged_Data_Platform.pdf

Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Real-time Analytics

TECHNICAL HIGHLIGHTS

- Base configuration of 64 nodes with SFF (1.8TB) drives. This also offers HA with 3 management nodes. This solution can be scaled further by adding data nodes, ideally in sets of 16 Cisco UCS C240 M4 servers.
- Up to 80 servers (5 racks) can be supported with no additional switching in a single Cisco UCS domain with no network over-subscription
- Offers scalable/sizable reference architectures for Spark batch processing, and Spark Streaming with Kafka, etc.

BUSINESS CHALLENGES

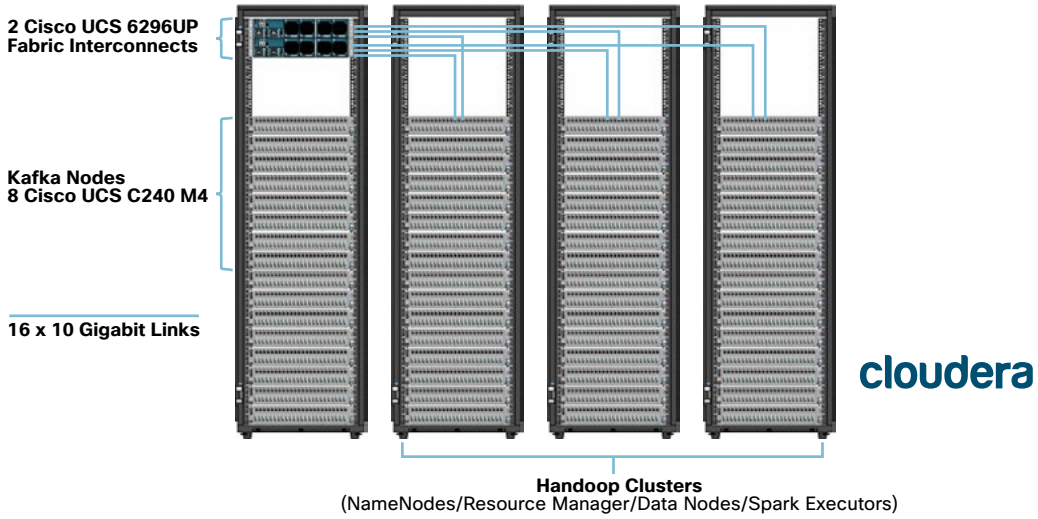
- Apache Spark brings batch and real-time data processing together to offer deeper and interactive insights to customers
- Spark Ecosystem offers a data-execution engine for all workloads with Spark Streaming, SparkSQL, and Spark Mlib
- Cloudera offers the fastest and easiest secure-data platform for Hadoop, along with Spark, and helps solves a magnitude of business challenges

SUMMARY

- Cisco and Cloudera provide companies with enterprise data management on a unified platform, with high performance, low cost, and help in utilizing data to drive better business insights
- This solution helps organizations exploit the valuable hidden potential of the data, regardless of whether it's structured, semi-structured or unstructured. Cloudera 5.7-is the leading version of enterprise-grade Hadoop infrastructure software and services along with a strong analytics stack

ARCHITECTURE

Cisco UCS with Cloudera and Apache Spark



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_Cloudera_and_Apache_Spark.html

Cisco UCS Integrated Infrastructure for Big Data with SAP HANA Vora

TECHNICAL HIGHLIGHTS

- Cisco Application Centric Infrastructure as the backbone of the solution
- FlexPod datacenter solution for SAP HANA
- Cisco UCS integrated infrastructure for big data – Up to 80 servers per Cisco UCS domain without network over-subscription
- SAP HANA Vora

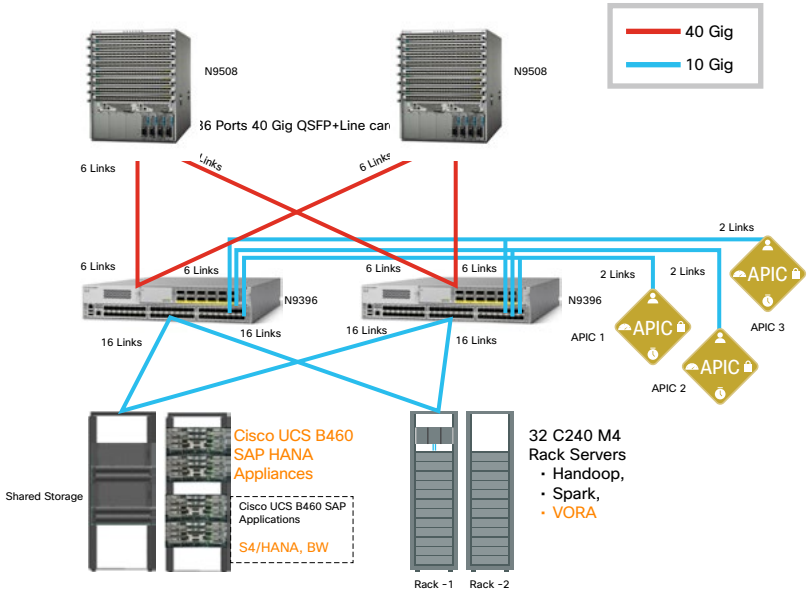
BUSINESS CHALLENGES

- Data from various sources are received and processed in their own silos
- Need correlation between various data sources: enterprise data, unstructured/ semi-structured big data(customer, partner, geo-location, mobile devices, social media), and newer sources like IoT sensors and smart devices
- Big data lives in Hadoop, enterprise data lives in enterprise DB, need to bridge the gap
- Need an infrastructure that can scale-up and scale-out to break down this digital divide

SUMMARY

- Detailed procedure and documentation for building the solution with:
  - Cisco Application Centric Infrastructure (ACI)
  - Cisco UCS Infrastructure
  - SAP HANA Vora on Hortonworks Data Platform
- Works with any SAP HANA datacenter solution implementation that connects to ACI infrastructure

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_SAP_HANA_Vora.html

Cisco UCS Integrated Infrastructure for SAP HANA

TECHNICAL HIGHLIGHTS

- Seamless scalability of performance and capacity meeting required KPIs for SAP HANA TDI deployments; also ensuring high availability without performance compromise through in-place software and hardware upgrades
- Details the reference architecture for SAP HANA TDI implementation leveraging existing Cisco UCS infrastructure and Pure Storage
- Sample SAP HANA scale-up and 3+1 scale-out system deployment best practices

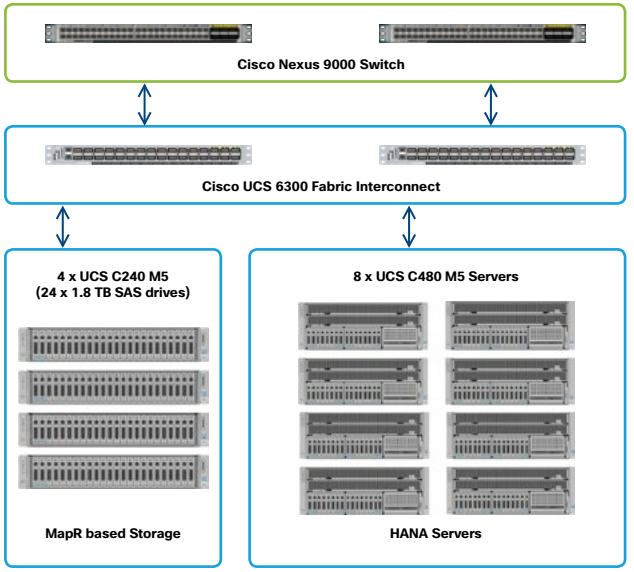
BUSINESS CHALLENGES

- SAP HANA TDI deployments are complicated and generally mission critical with high availability requirements. Customers face challenges maintaining these landscapes both in terms of time, available resources and operational cost
- Availability of pre-tested, scalable and best-in-class converged solution stack for optimizing enterprise workloads running SAP HANA database-based applications

SUMMARY

- A single platform built from unified compute, fabric and storage technologies, allowing you to scale to large-scale implementations without architectural changes
- Leverage a secure, integrated, and optimized converged stack that is pre-sized, configurable and deployable in a flexible manner for SAP HANA implementations.

ARCHITECTURE



CVD with RHEL 6.7: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_mapr.html
CVD with SLES: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_sles.html
CVD with RHEL 7: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_rhel.html

Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI

TECHNICAL HIGHLIGHTS

- The base configuration consists of 1 UCSDE management node and 80 Hadoop nodes with SFF/LFF drives. This solution could be scaled further just by adding nodes ideally in sets of 16 Cisco UCS C240 M4 servers
- Up to 80 servers (5 racks) can be supported with no additional switching in a single Cisco UCS domain with no network over-subscription

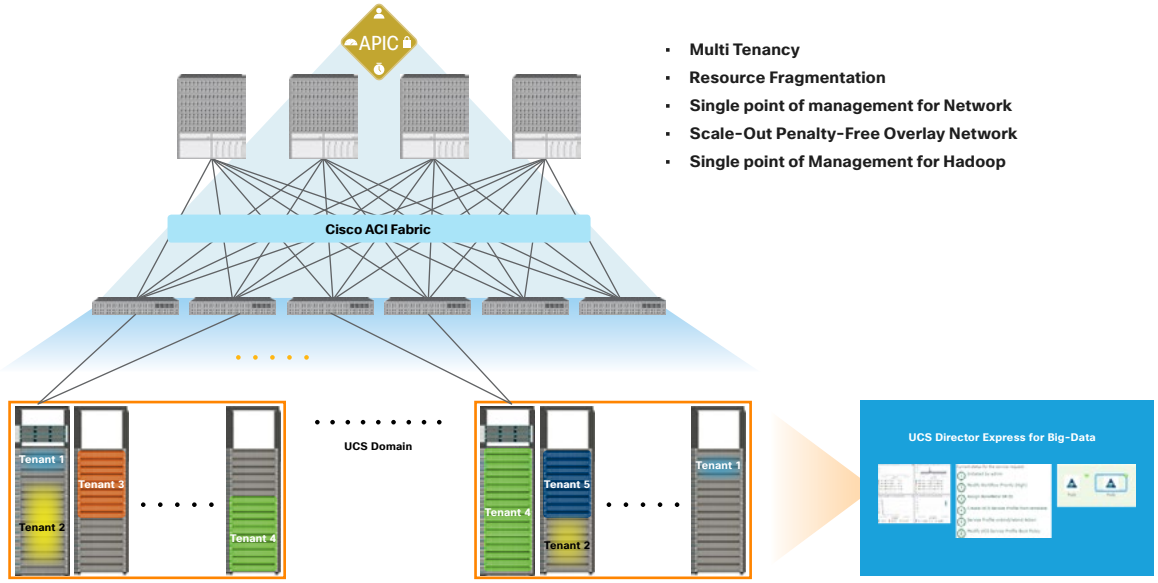
BUSINESS CHALLENGES

- Data center's biggest challenge is the provisioning and managing of the large number of Hadoop nodes
- Consolidating multiple-Hadoop clusters in a single, centrally managed physical cluster to improve infrastructure utilization, and provide access controls and security isolation between tenants

SUMMARY

- Cisco UCSDE provides centralized visibility into the complete infrastructure and big data application to identify potential failures and latent threats before they affect application and business performance
- ACI provides centralized visibility to the entire network with deep telemetry and real-time network health status for each tenant
- Cisco UCS Integrated Infrastructure for Big Data with ACI, offers a linearly scalable architecture and simplification of essential operations for single-rack and multiple-rack deployments spanning thousands of servers

ARCHITECTURE



- **Multi Tenancy**
- **Resource Fragmentation**
- **Single point of management for Network**
- **Scale-Out Penalty-Free Overlay Network**
- **Single point of Management for Hadoop**

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HaaS_on_Bare_Metal_with_UCSDExpress_on_Cisco_UCS_Integrated_Infrastructure_for_Big_Data_and_ACI.html

Cisco UCS Integrated Infrastructure for Big Data with IBM BigInsights for Apache Hadoop

TECHNICAL HIGHLIGHTS

- The base configuration consists of 3 management nodes and 16 Data nodes with LFF (6TB) drives. This solution could be scaled further just by adding data nodes ideally in sets of 16 Cisco UCS C240 M4 servers
- Up to 80 servers (5 racks) can be supported with no additional switching in a single Cisco UCS domain with no network over-subscription

BUSINESS CHALLENGES

- Biggest challenge for data scientists and analysts to reuse their experience and tools in Big Data landscape
- IBM BigInsights offers BigSQL a feature rich SQL engine on Hadoop that can deliver analytic capabilities on Hadoop
- IBM BigInsights introduces enterprise capabilities for Hadoop, including machine learning with Big R to help data scientists, analysts and administrators accelerate

SUMMARY

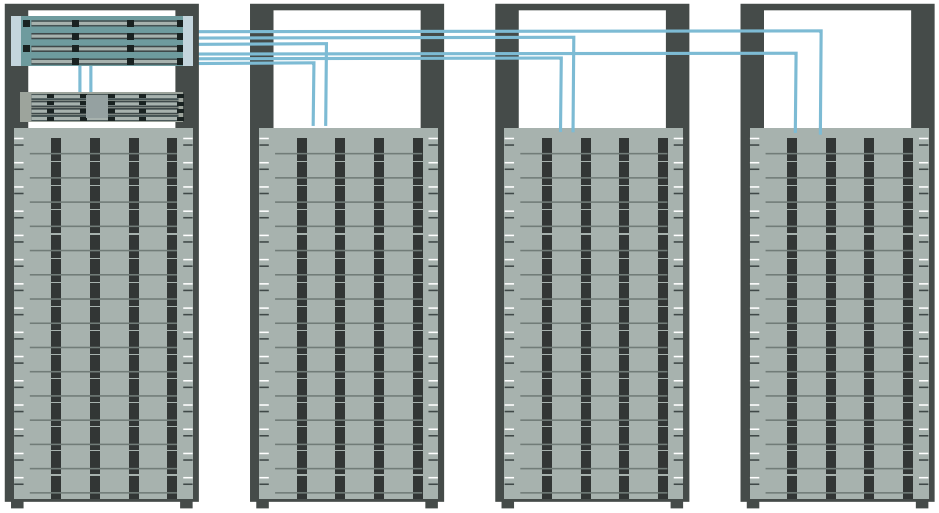
- Cisco and IBM provide enterprises with transparent, simplified data as well as management integration with an enterprise application ecosystem
- This solution helps organizations to exploit the valuable business insights in all their data, regardless of whether it's structured, semi structured or unstructured. Big Insights 3.1 is the leading version of enterprise-grade Hadoop infrastructure software and services along with a strong analytics stack and machine learning capabilities

ARCHITECTURE

2 X Cisco UCS 6296 Fabric Interconnect

3 X Cisco UCS C220 M4 Server

64 X Cisco UCS C240 M4 Servers



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_IBM.html

Cisco UCS Integrated Infrastructure with Application Centric Infrastructure (ACI) and Cloudera

TECHNICAL HIGHLIGHTS

- 160 UCS C240 M4 (SFF/LFF) servers with scale-out option up to 5760 servers in a single switching domain
- Two Cisco N9K-C9508
- 23 Cisco N9K-C9396PX
- Three APIC-L1
- Cloudera Hadoop 5.0

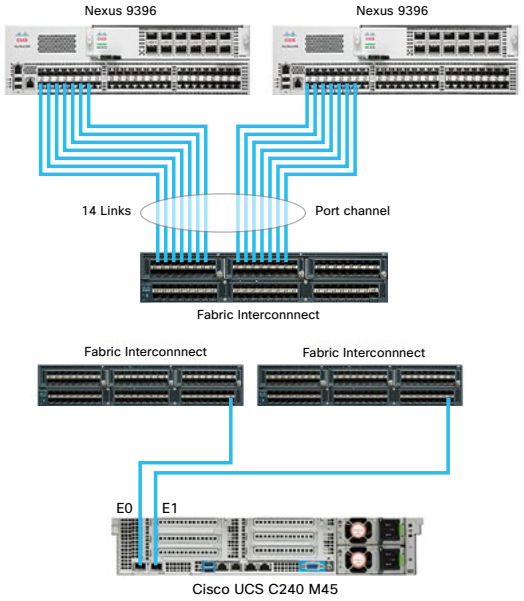
BUSINESS CHALLENGES

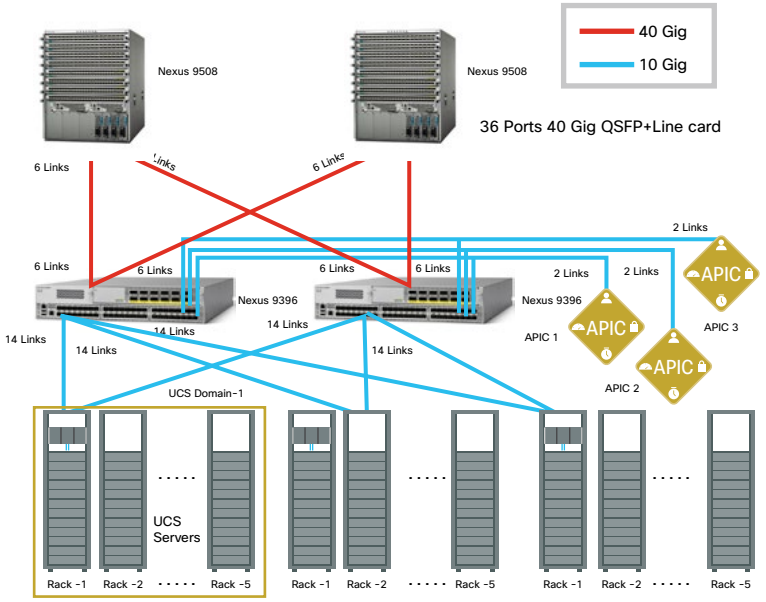
- Scalability, performance and support for multi-tenancy that enforces proper isolation and SLA's for workloads of different tenants
- Centralized network visibility with real time application health monitoring
- Simplified automation through application driven policy model
- Best practices for installing Cloudera Distribution for Apache Hadoop 5.0 tuned for performance and scalability

SUMMARY

- Scaling to thousands of servers with no over-subscription within a UCS domain, and 5.7.1 over-subscription between domains
- Radically simplifies, optimizes, and accelerates the entire application deployment lifecycle
- The Cisco ACI policy model is designed top down using a promise theory model to control a scalable architecture of defined network and service objects
- Centralized management for servers and network independently
- Best practices for Hadoop 2.0 services tuning

ARCHITECTURE





CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_ACI_and_Cloudera.pdf

Cisco UCS Integrated Infrastructure with Hortonworks

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M4 (SFF/LFF) with four C3160 servers with scale-out option up to five racks in a single switching domain
- Cisco UCS® Director Express for Big Data offers one-click provisioning, installation, and configuration
- HDP 2.2 includes HDFS tiered-storage support (with related storage policies) to manage tiers of hot, warm, and cold data. Solution focuses on moving cold/archival data to Cisco UCS C3160 through while maintaining hot and warm data in faster Cisco UCS C240 M4 series servers

BUSINESS CHALLENGES

- Data lifecycle management for Hadoop where usage and utility of data can be categorized into hot (recent data), warm (not-so-recent) and cold (archival data)
- Cost-effective solution for the full lifecycle of data, processing it as applications demand
- Enterprise SQL on Hadoop with cost optimizations and interactive queries

SUMMARY

- Committed to 100% open source distribution
- Cisco UCS Integrated Infrastructure for Big Data and Hortonworks Data Platform offer comprehensive set of capabilities for data management, data access, data governance and integration and operations
- Next version of Hadoop HDP 2.2 with enterprise SQL and tiered-storage support

ARCHITECTURE

2 X Cisco UCS 6296 Fabric Interconnect

16 X Cisco UCS C240 M4 Server

Cisco UCS C3160 Server

Hortonworks

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Bigdata_with_Hortonworks.pdf

Cisco UCS Integrated Infrastructure with MapR

TECHNICAL HIGHLIGHTS

- Detailed instructions for installation and fine tuning MapR on a 64 node UCS C240 M4 (SFF/LFF) cluster
- Detailed configuration of multi-tenancy with:
  - Data and compute isolation
  - Enforced quotas
  - High availability
  - Associating tenants with volumes
  - Ability to manage SLAs with data placement and job placement control

BUSINESS CHALLENGES

- Multi-tenancy is the capability of a single instance of software to serve multiple tenants. A tenant is a group of users that have the same view of the system
- Hadoop is an enterprise data hub, and it demands multi-tenancy. Big Data platforms are increasingly expected to support multi-tenancy by default
- Multi-tenancy requires isolation of the distinct tenants: both the data in the data platform and the computing aspect

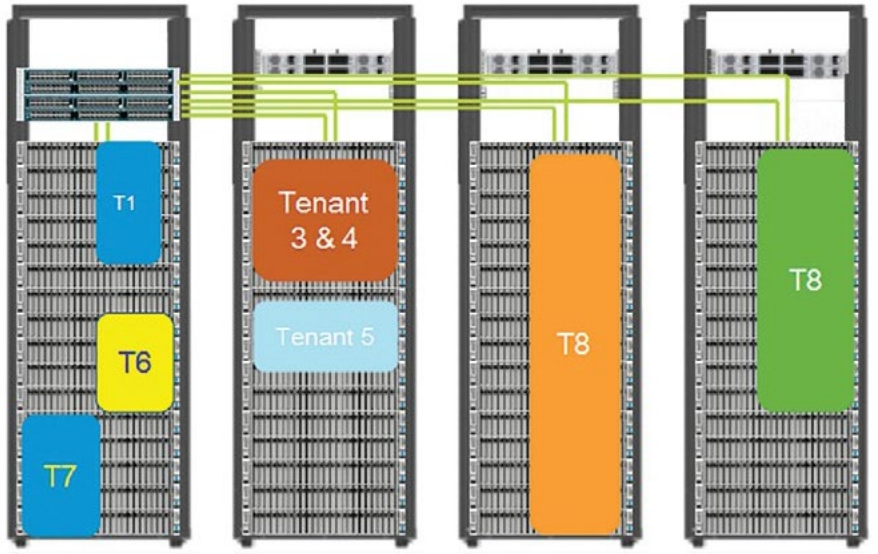
SUMMARY

- Multi-tenancy with MapR supports data and job placement control to isolate sensitive data and applications
- Ubiquitous high availability with no-NameNode architecture, YARN high availability, and NFS high availability
- Simplified management through Cisco UCSM and MapR Control System (MCS)
- Ease of deployment
- Scalability for Big Data workloads

ARCHITECTURE

2 X Cisco UCS 6296 Fabric Interconnect

16 X Cisco UCS C240 M4 Server



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_MapR.pdf

Cisco UCS Integrated Infrastructure with Splunk Enterprise

TECHNICAL HIGHLIGHTS

- 8 Cisco UCS C240 M4 rack servers
- 5 Cisco UCS C220 M4 rack servers
- 1 Cisco UCS C3160 rack server
- 2 Cisco UCS 6296UP fabric interconnects
- Splunk Enterprise 6.2.2 and greater
- Cisco UCS C220 M4 rack servers serve as search heads to form the Splunk search head cluster, providing a highly available analytics interface for the end user
- Cisco UCS C3160 rack server as NFS server to archive frozen data
- Cisco UCS C240 M4 rack servers serve as indexers to form the Splunk indexer cluster, providing industry-leading scalability and reliability mission critical data storage

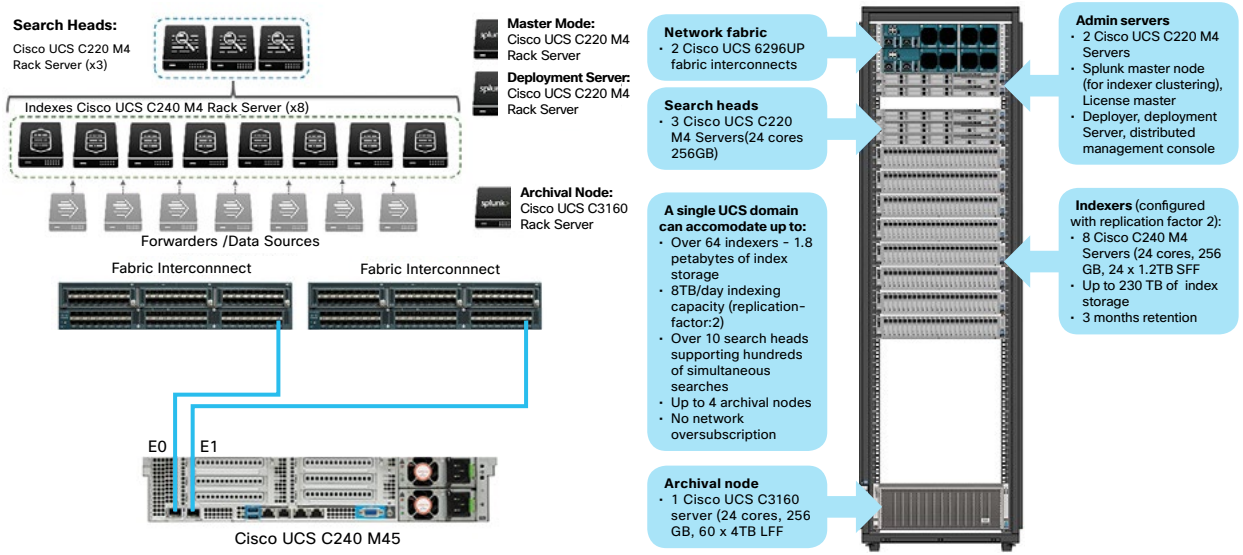
BUSINESS CHALLENGES

- Modern day datacenters generate machine data in the order of terabytes (TBs) to hundreds of TBs every day. The organization needs to collect, process, manage, derive business insights from this large amount of data
- Organizations need an integrated infra-structure for processing machine data that's efficient, reliable and secure
- Need to retain collected for longer term analysis, or need to put in an integrated storage medium for retrieval at a later point in time

SUMMARY

- Built on the Cisco UCS Integrated Infrastructure for Big Data for Splunk Enterprise distributed search with High Capacity reference architecture
- Cisco UCS Integrated Infrastructure offers horizontal scalability for Splunk Enterprise clusters
- Pre-validated configuration radically simplifies, and accelerates the entire Splunk distributed search deployment process
- Cisco UCS C3160 rack server offers unmatched high density storage capacity in small form factor to store frozen data that is readily accessible to Splunk Enterprise clusters
- Best practices for highly available distributed search deployment using Splunk Enterprise

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_Integrated_Infrastructure_for_Big_Data_with_Splunk.pdf

Data-Intensive Storage

BIG DATA

Common Platform Architecture (CPA)

- Big Data 60 node Hadoop Cluster with EMC Isilon
- Big Data Cisco Application Centric Infrastructure (ACI) with Cloudera
- Cisco UCS CPAv2 for Big Data with Cloudera
- Cisco UCS CPAv2 for Big Data with Hortonworks
- Hadoop-as-a-Service (HaaS) with Cisco UCS CPAv2 for Big Data and OpenStack
- Cisco UCS CPAv2 for Big Data with Intel Distribution
- Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ

The Big Data market continues to explode. Industry analysts project that it will exceed $210 billion by 2020, with a whopping compound annual growth rate (CAGR) of 11.9 percent. These estimates include hardware, software, and services revenue. Source: IDC

Big Data 60 node Hadoop Cluster with EMC Isilon

TECHNICAL HIGHLIGHTS

- Cisco UCS 5108 blade chassis with 2208XP fabric extender modules
- Cisco UCS B200 M3 blade servers
- Cisco UCS 6296UP fabric interconnects
- EMC Isilon S200 with OneFS 7.2.0.0
- VMware vSphere 5.5, vCenter Server 5.5 with Big Data extensions 2.1
- Cloudera Manager 5.2 with CDH 5.1.3

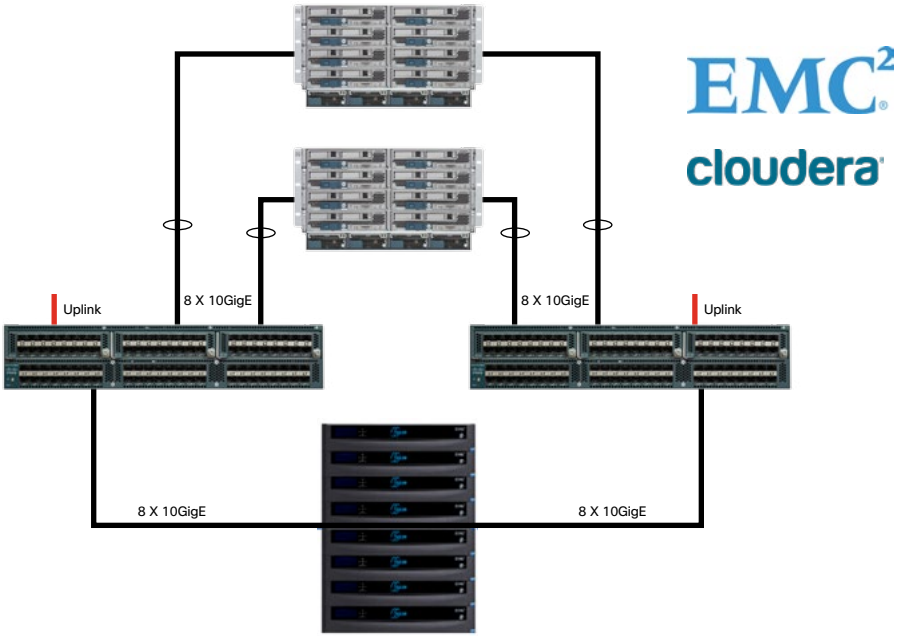
BUSINESS CHALLENGES

- Need to address scalability and deployment challenges in enterprise Hadoop deployments to rapidly increase or decrease the compute, storage and memory allocated to the Hadoop nodes
- Best practices for creating a virtualized enterprise grade Hadoop solution using Cisco UCS, EMC Isilon and Cloudera Distribution Apache Hadoop to meet the changing needs of enterprises, while minimizing downtime
- Ability to scale compute nodes and HDFS storage nodes independent of each other

SUMMARY

- End-to-end installation virtualized Hadoop solution with predictable scalability implementing Business Data Lake architecture
- Unified compute for MapReduce and Isilon multi protocol scale-out NAS platform for distributed NameNode and DataNode services
- Detailed instructions for installation and fine tuning for Big Data workloads

ARCHITECTURE



EMC²
cloudera

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_and_EMC_Isilon-with-Cloudera_CDH5.pdf

Big Data Cisco Application Centric Infrastructure (ACI) with Cloudera

TECHNICAL HIGHLIGHTS

- 42 UCS C240 M3 (SFF/LFF) servers with scale-out option up to 964 servers in a single switching domain
- Two Cisco NK-C9508
- 23 Cisco N9K-C9396PX
- 12 Cisco N9K-C93128TX
- Three APIC-L1
- Cloudera Hadoop 5.0

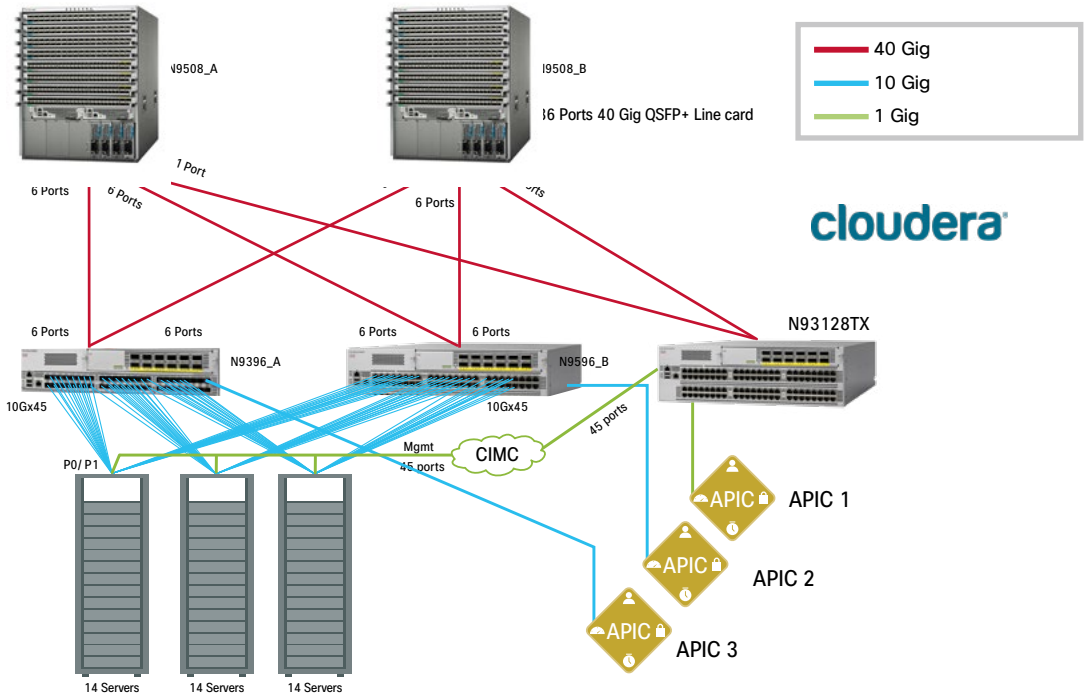
BUSINESS CHALLENGES

- Scalable performance and multi-tenancy in hardware
- Centralized network visibility with real time application health monitoring
- Simplified automation through application driven policy model
- Best practices for installing Cloudera Distribution for Apache Hadoop 5.0 tuned for performance and scalability

SUMMARY

- Scaling to thousands of servers with no network over-subscription
- Application centric management
- Best practices for Hadoop 2.0 services tuning

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_ACI_Architecture_for_BigData_with_Cloudera.pdf

Cisco UCS CPAv2 for Big Data with Cloudera

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M3 (SFF/LFF) servers with scale out option up to 10 racks in a single switching domain
- Detailed instructions for installation and fine tuning for Big Data workloads
- Detailed Raid configuration and operating system tuning for Big Data application performance

BUSINESS CHALLENGES

- Highly scalable architecture designed to meet a variety of scale-out application (Big Data) demands with seamless data integration and management
- Support for multiple distributed computational frameworks on same Hadoop cluster
- Best practices for installing Cloudera Distribution for Apache Hadoop 5.0 tuned for performance and scalability

SUMMARY

- Next version of Hadoop Map/Reduce (Yarn)
- End-to-end installation for Cloudera Distribution of Apache Hadoop for performance and scalability
- Best practices for Hadoop 2.0 services tuning

ARCHITECTURE

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_CPAv2_for_Big_Data_with_CDH_C5.pdf

Cisco UCS CPAv2 for Big Data with Hortonworks

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M3 (SFF/LFF) servers with scale-out option up to 10 racks in a single switching domain
- Detailed instructions for installation and fine tuning for Big Data workloads
- Detailed Raid configuration and operating system tuning for Big Data application performance

BUSINESS CHALLENGES

- Highly scalable architecture designed to meet a variety of scale-out application (Big Data) demands with seamless data integration and management
- Support for multiple distributed computational frameworks on same Hadoop cluster
- 100 percent open source distribution with enterprise support

SUMMARY

- Committed to 100% open source distribution
- End-to-end installation for Hortonworks HDP 2.0
- Next version of Hadoop Map/Reduce (Yarn)

ARCHITECTURE

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/CPA2_for_BigData_with_Hortonworks.pdf

Hadoop-as-a-Service (HaaS) with Cisco UCS CPAv2 for Big Data and OpenStack

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M3 (SFF/LFF) servers with scale-out option up to 10 racks in a single switching domain
- Detailed instructions for installation and fine tuning for Big Data workloads
- Detailed Raid configuration and operating system tuning for Big Data application performance

BUSINESS CHALLENGES

- Highly scalable architecture offering Hadoop-as-a-Service
- Running Hadoop on OpenStack
- Enterprise-grade, hardened Apache Hadoop distribution with excellent support
- 100 percent open source distribution with enterprise support

SUMMARY

- Self service provisioning of Hadoop
- Tuning OpenStack for Hadoop
- End-to-end installation for Hortonworks HDP 2.0 on VM's managed by OpenStack

ARCHITECTURE

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/CPA2_for_BigData_with_Hortonworks_for_HaaS.html

Cisco UCS CPAv2 for Big Data with Intel Distribution

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M3 (SFF/LFF) servers with scale-out option for up to 10 racks in a single switching domain
- Detailed role-based access control and other security setting
- Detailed RAID configuration and operating system tuning for Big Data application performance

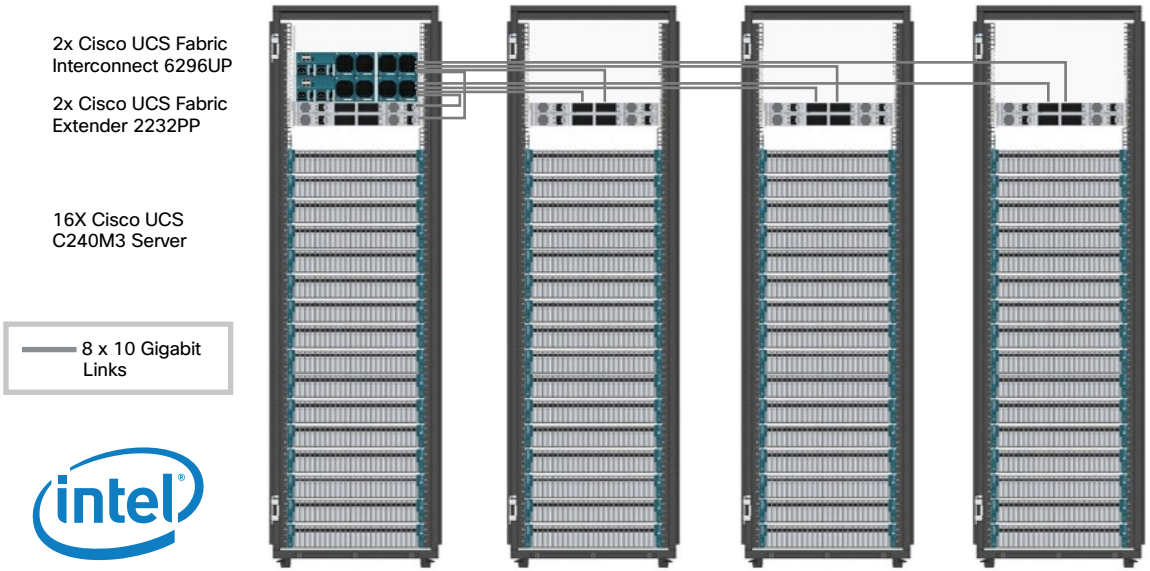
BUSINESS CHALLENGES

- Highly scalable architecture designed to meet a variety of scale-out application (Big Data) demands with seamless data integration and management
- Enterprise-grade, hardened Apache Hadoop distribution with excellent support
- Hardware-assisted encryption using AES-NI technology beneficial for HIPPA and payment card industry (PCI) data security

SUMMARY

- Focused on hardware-assisted encryption, security, fine-grained access control (ACL), role-based access control, and Kerberos
- End-to-end installation for Intel distribution 2.5

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_CPA_for_Big_Data_with_Intel.html

Cisco UCS CPAv2 for Big Data with Pivotal HD and HAWQ

TECHNICAL HIGHLIGHTS

- 64 UCS C240 M3 LFF servers with scale-out option of up to 10 racks in a single switching domain
- Apache Hadoop 2.0 distribution with YARN
- Detailed RAID configuration and operating system tuning for Big Data application performance

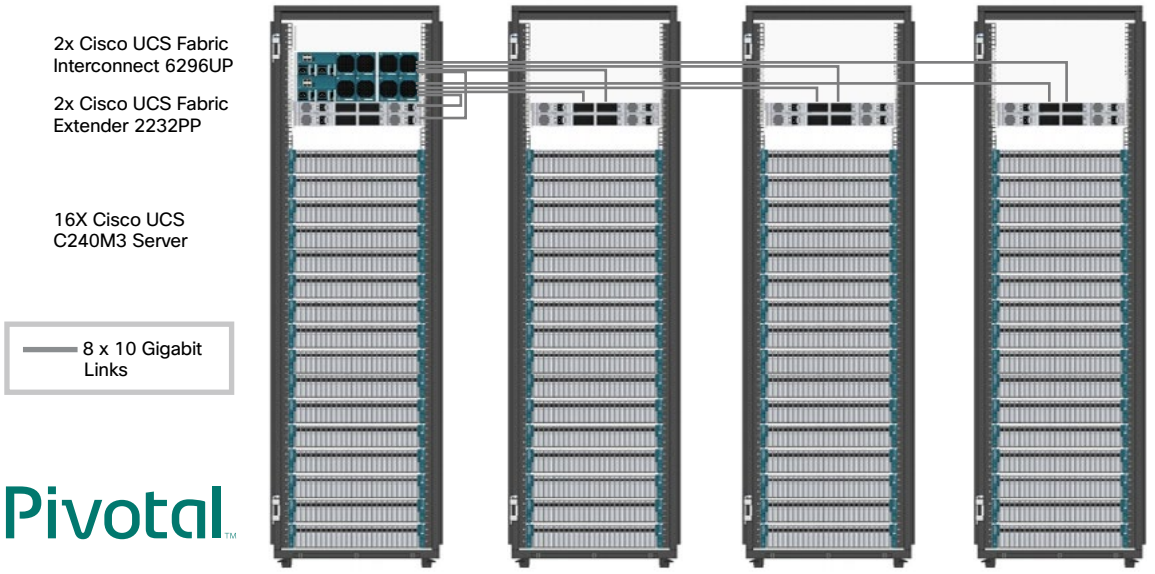
BUSINESS CHALLENGES

- Require highly scalable architecture capable of meeting scale-out application (Big Data) demands with seamless data integration and management
- Need an enterprise-grade, hardened Apache Hadoop distribution with support
- Hadoop 2.0 with Yarn and HAWQ, a 100 percent compliant SQL query engine on Hadoop

SUMMARY

- HAWQ with its parallel SQL processing is fully SQL compliant on Hadoop
- End-to-end installation for Pivotal HD 1.1 and HAWQ 1.1

ARCHITECTURE



CVD: https://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/Cisco_UCS_CPA_for_Big_Data_with_Pivotal.html

Data-Intensive Storage

BIG DATA

Analytics

- Cisco SAS Edge to Enterprise IoT Analytics Platform

The Big Data market continues to explode. Industry analysts project that it will exceed $210 billion by 2020, with a whopping compound annual growth rate (CAGR) of 11.9 percent. These estimates include hardware, software, and services revenue. Source: IDC

Cisco SAS Edge-to-Enterprise IOT Analytics Platform

TECHNICAL HIGHLIGHTS

- Multi-phase analytics at edge on Cisco routers/switches and at data center on UCS infrastructure enabled by SAS software
- Complete orchestration of device and application using Cisco Fog-Director. Automation of infrastructure and data platform with UCS Manager and UCS Director Express
- Highly scalable architecture with resiliency using a high-performance gateway for sensor data ingest

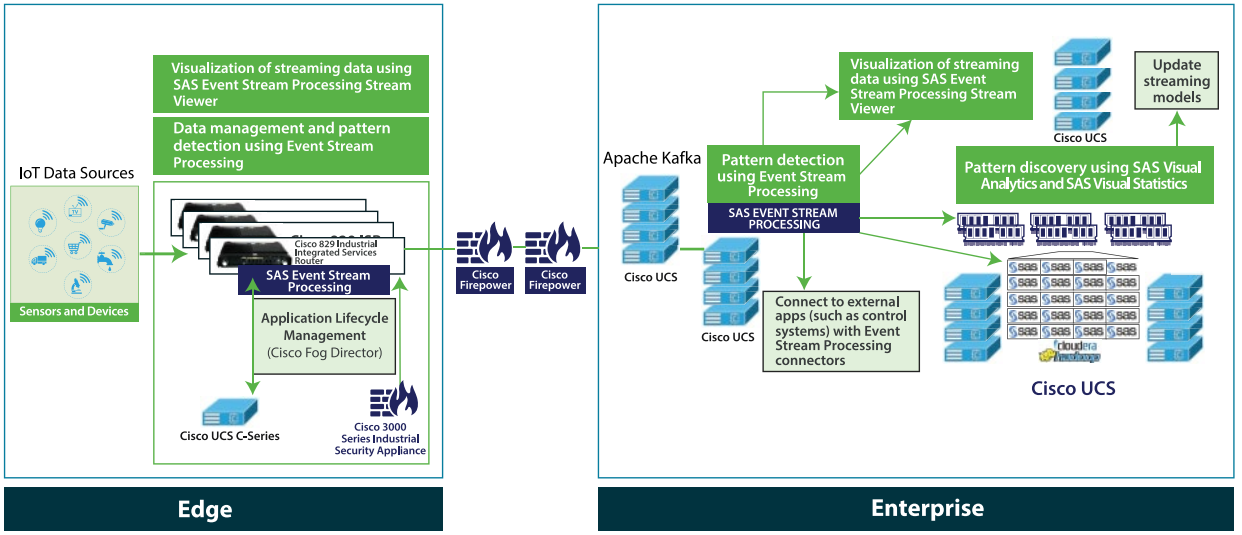
BUSINESS CHALLENGES

- Edge-to-Enterprise – analyze local and remote data in real time
- Insights – discover, understand, and act in real time
- Scale – from POC to production

SUMMARY

- Industries first comprehensive solution encompassing Cisco routers and switches at edge and UCS infrastructure at data center with SAS software enabling multi-phase analytics.
- Provides end-to-end orchestration platform comprising off device, application and infrastructure
- CVD eliminates risk and leverages Cisco routers/switches, Cisco UCS infrastructure and SAS software efficiencies for an optimal platform.

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Cisco_SAS_Edge_to_Enterprise_IoT_Analytics_Platform.html

Data-Intensive Storage

DATA PROTECTION

- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments – ***New***
- Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment
- FlashStack VSI with Commvault for Data Protection

The Big Data market continues to explode. Industry analysts project that it will exceed $210 billion by 2020, with a whopping compound annual growth rate (CAGR) of 11.9 percent. These estimates include hardware, software, and services revenue. Source: IDC

Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments

TECHNICAL HIGHLIGHTS

- Integrated UCS Management for HyperFlex and S3260 storage server and single Veeam console to manage backup and replication of VM across several HyperFlex clusters across geography
- Storage integration of Cisco HyperFlex with Veeam providing HX native snapshots and higher backup throughput through HX storage network
- All-in-one, scalable and easy-to-deploy validated design and deployment guide for multisite HyperFlex, Veeam and Cisco UCS S3260 storage server

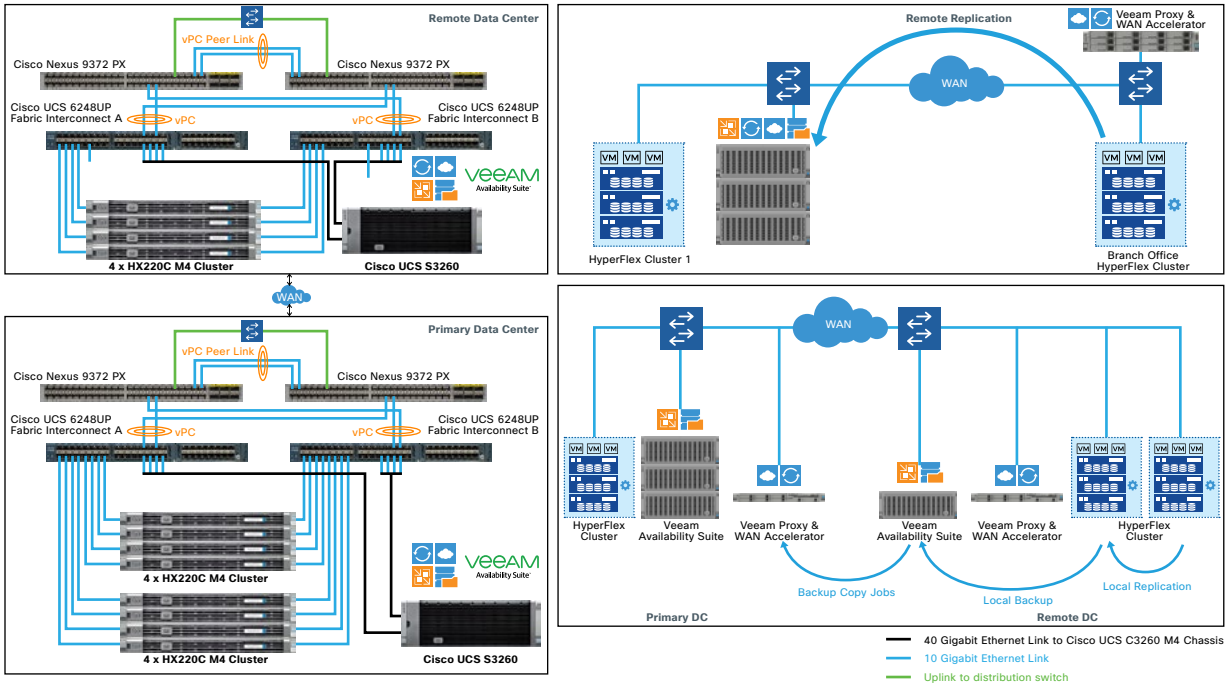
BUSINESS CHALLENGES

- High RPO/RTO with multiple hours of restore & backup time for 24/7 business critical applications on Cisco HyperFlex
- High OPEX in managing data protection endpoints for HyperFlex clusters in multiple sites across geography
- Replication of application VM deployed across data centers on HyperFlex clusters

SUMMARY

- Enable RPO/RTO's < 15 minutes with instant VM Recovery™, Veeam Explorer™ for Microsoft Exchange, Active Directory, SharePoint, and SQL server, Veeam Explorer for Oracle
- Scalable Veeam Repository on UCS Managed S3260 storage servers and C240 M4 LFF rack servers
- Best practices to deploy multisite HyperFlex cluster with Veeam and Cisco UCS S3260 storage server

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/dataprotection_hx_veeam_multisite.html

Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment

TECHNICAL HIGHLIGHTS

- Integrated UCS Management for HyperFlex and S3260 storage server
- Single Veeam console to manage backup and replication of application VM across several HyperFlex clusters
- All-in-one, scalable and easy-to-deploy validated design and deployment guide for Veeam, HyperFlex and Cisco UCS S3260 storage server

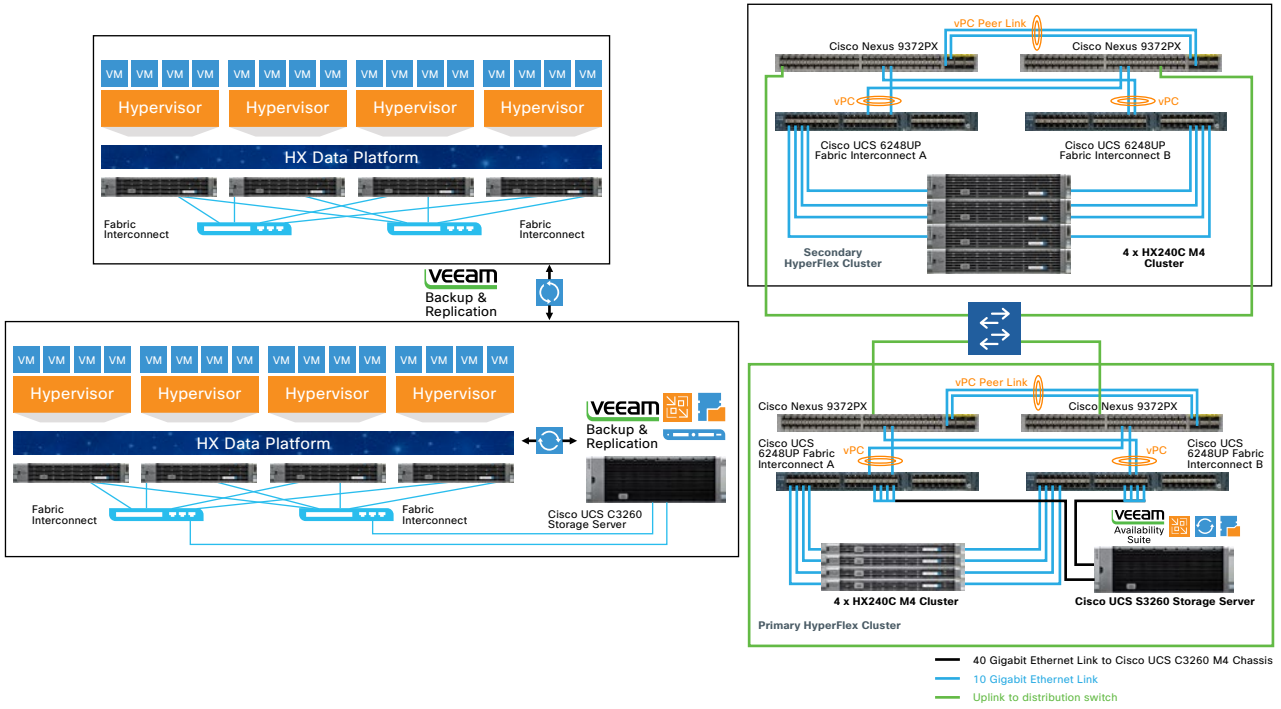
BUSINESS CHALLENGES

- High RPO/RTO with multiple hours of restore time or data loss for 24/7 business critical applications
- High OPEX in managing data protection endpoints for multiple HX clusters in remote offices deployed across geography
- Single solution to deploy, configure and optimize HX backup and replication with Veeam 9.5 and Cisco S3260 Storage Server

SUMMARY

- Enable RPO/RTO's < 15 minutes with Instant VM Recovery™, Veeam Explorer™ for Microsoft Exchange, Active Directory, SharePoint, and SQL Server, Veeam Explorer for Oracle
- Scalable Veeam repository on UCS Managed S3260 storage servers
- Best practices to deploy HyperFlex cluster with Veeam and Cisco UCS S3260 storage server

ARCHITECTURE



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FlashStack VSI with Commvault for Data Protection

TECHNICAL HIGHLIGHTS

- High speed archive repositories using the Cisco S3260 servers
- VM data protection working with the native FlashArray//m snapshots
- Local, remote site, and cloud archiving options
- Live VM recovery and remote live synch

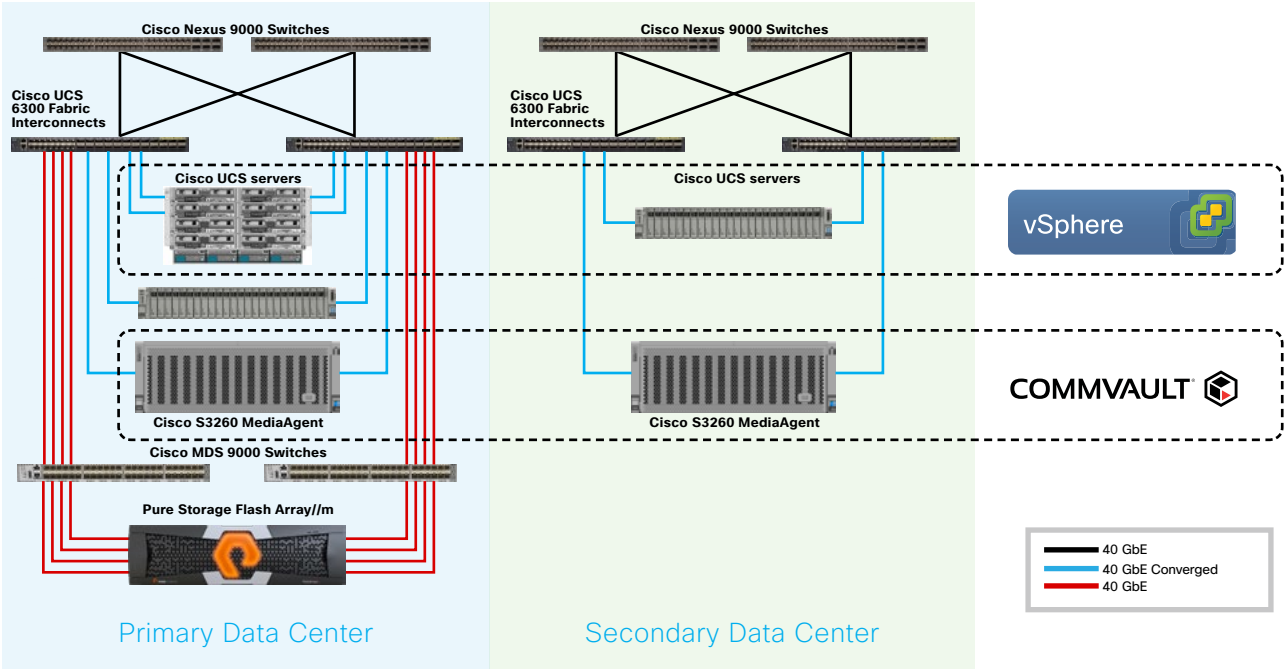
BUSINESS CHALLENGES

- Business continuity
- Multi-site data protection
- Fast and reliable RPTO

SUMMARY

- Modern data protection delivered within the FlashStack Virtual Server Infrastructure
- Full deployment walkthrough along with feature validation
- Total solution that brings together performance, efficiency, automation, availability, and recoverability

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_commvault.html

Data-Intensive Storage

SCALE-OUT STORAGE

- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage – ***New***
- Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage – ***New***
- Cisco UCS S3260 Storage Server with Red Hat Ceph Storage
- Cisco UCS Storage Server with Scality Ring

The Big Data market continues to explode. Industry analysts project that it will exceed $210 billion by 2020, with a whopping compound annual growth rate (CAGR) of 11.9 percent. These estimates include hardware, software, and services revenue. Source: IDC

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

TECHNICAL HIGHLIGHTS

- End-to-end 40G capable UCS Architecture delivers high-throughput performance with programmable QoS critical for scale-out storage solutions
- Unified scale-out framework - optimized to deliver compute, capacity and throughput intensive workloads
- True scale-out storage with self-healing capabilities combined with object services support

BUSINESS CHALLENGES

- Enterprises today struggle to manage the explosive growth of data while remaining agile and cost competitive
- 70% of IT decision makers believe that their current storage systems will not be able to handle next generation workloads
- Inadequate storage infrastructure is considered to be a significant pain point

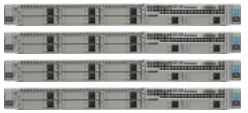
SUMMARY

- IBM COS provides the industry leading solution to manage unstructured data in a scalable, reliable, secure, and cost-effective environment
- Cisco and IBM are collaborating to offer customers a scalable object storage solution for unstructured data that integrates with IBM Cloud Object Storage
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center

ARCHITECTURE

- 2 x 6332 Fabric Interconnects
- Full Deployment UCS Managed
- 40 GbE end-to-end
- Up to 3.3 PB Raw Capacity in 6 S3260 - 24RU

- 1 x C220 M4 Server
- 1 x IBM COS Manager



- 4 x C220 M4 Servers
- 4 x IBM COS Accessers

IBM

- 6 x S3260 Storage Servers
- 12 x M4 Server Nodes
- 12 x IBM COS Slicestors

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Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage

TECHNICAL HIGHLIGHTS

- Massive and highly configurable scale-out storage solution designed for petabyte scalability
- Up to 600TB of RAW storage and 160Gb of network within 4RU rack space and end-to-end 40G capable UCS Architecture delivers high-throughput critical for scale-out storage solutions
- Delivers around 8,000 PUT and 25,000 GET HTTP requests and 35 GB/s of external facing client network bandwidth

BUSINESS CHALLENGES

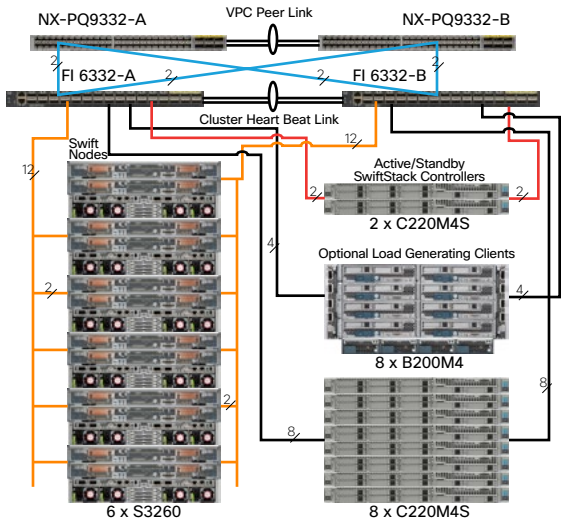
- Unstructured data is growing at an exponential rate and it is putting tremendous pressure on IT
- Enterprises require cloud-scale infrastructure that can scale seamlessly without any limitation
- Legacy storage cannot address unstructured data challenges which requires cloud-like economies of scale

SUMMARY

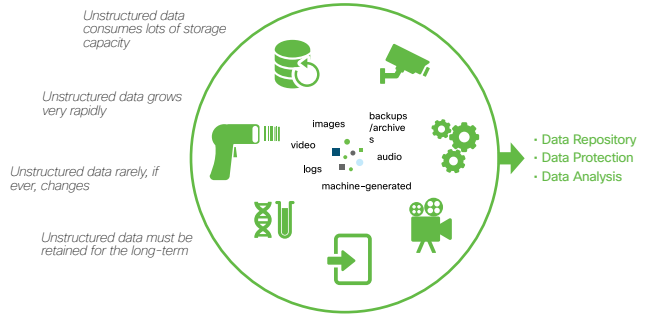
- Best-of-Breed scale-out storage solution by SwiftStack and Cisco UCS
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center
- Hybrid cloud storage solution for current and next generation applications

ARCHITECTURE

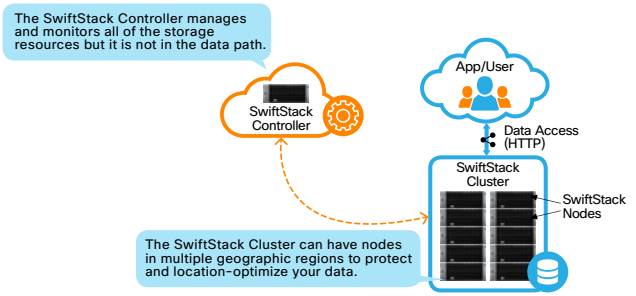
SwiftStack Object Storage on Cisco UCS S3260



Object Storage Use Cases



SwiftStack System Architecture



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ciscoswiftstack_ucs3260ss_deploy.html

Cisco UCS S3260 Storage Server with Red Hat Ceph Storage

TECHNICAL HIGHLIGHTS

- 5 Cisco UCS S3260 servers with an operational guide to increase the environment with further servers
- Design and deployment guide for Red Hat Ceph Storage on Cisco UCS S3260
- Detailed instructions for installation and fine tuning for Cisco UCS S3260 and Red Hat Ceph Storage

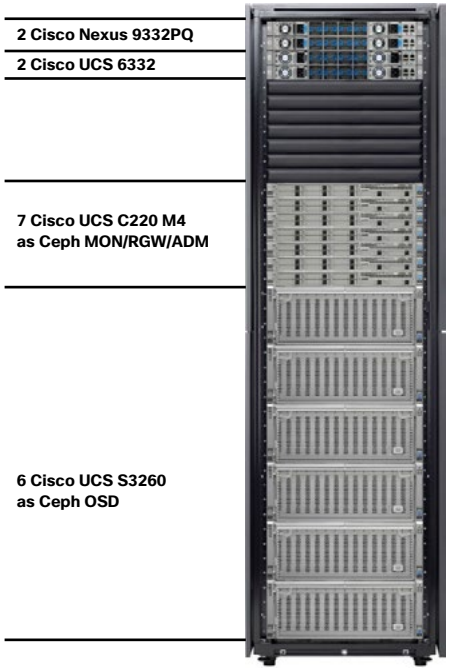
BUSINESS CHALLENGES

- Enterprises today struggle to manage the explosive growth of data while remaining agile and cost competitive
- 70% of IT decision makers believe that their current storage systems will not be able to handle next generation workloads
- Inadequate storage infrastructure is considered to be a main pain point

SUMMARY

- Software-defined storage solution for various workloads and large scale environments
- Unified, embedded management with UCS Manager for an easy-to-scale infrastructure
- Operational guide to extend the solution with the help of UCS Manager

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_s3260_rhceph21.html

Cisco UCS Storage Server with Scality Ring

TECHNICAL HIGHLIGHTS

- End-to-end 40G capable UCS architecture delivers high-throughput performance with programmable QoS critical for scale-out storage solutions
- Unified scale-out framework--optimized to deliver compute, capacity and throughput intensive workloads
- True scale-out storage with self-healing capabilities combined with object and file services support

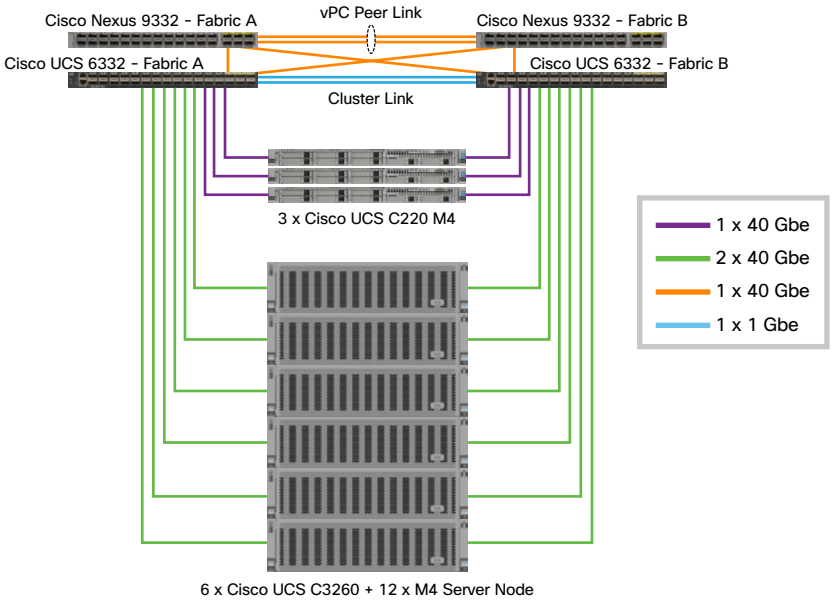
BUSINESS CHALLENGES

- IoT and digital transformation is driving data growth, and it is putting tremendous pressure on IT
- IDC shows that 80% of new data that is being generated is unstructured and it cannot be addressed by traditional storage
- Capacity management with seamless scaling to PBs in a cost efficient manner

SUMMARY

- Massively scalable, software-defined storage system that gives you unified storage to run your business
- Cisco and Scality are collaborating to offer customers a scalable object storage solution for unstructured data that is integrated with Scality RING Storage
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_s3260_scalityring.html

Infrastructure | Automation

- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution – ***New***
- FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 – ***New***
- Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI
- FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)
- FlexPod with Cisco UCS Director and Nexus 9000 Standalone
- VersaStack for Data Center with Cisco UCS Director

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution

TECHNICAL HIGHLIGHTS

- VersaStack with Cisco ACI and SVC for private cloud and IBM Bluemix public cloud
- Cisco ONE Enterprise Cloud Suite, which includes CloudCenter to automate self-service application deployment to users' choice of on-premises or public cloud environments
- IBM Spectrum Copy Data Management that orchestrates the creation, distribution, efficient use, and retention of application-aware copies of data, both on-premises and in the cloud

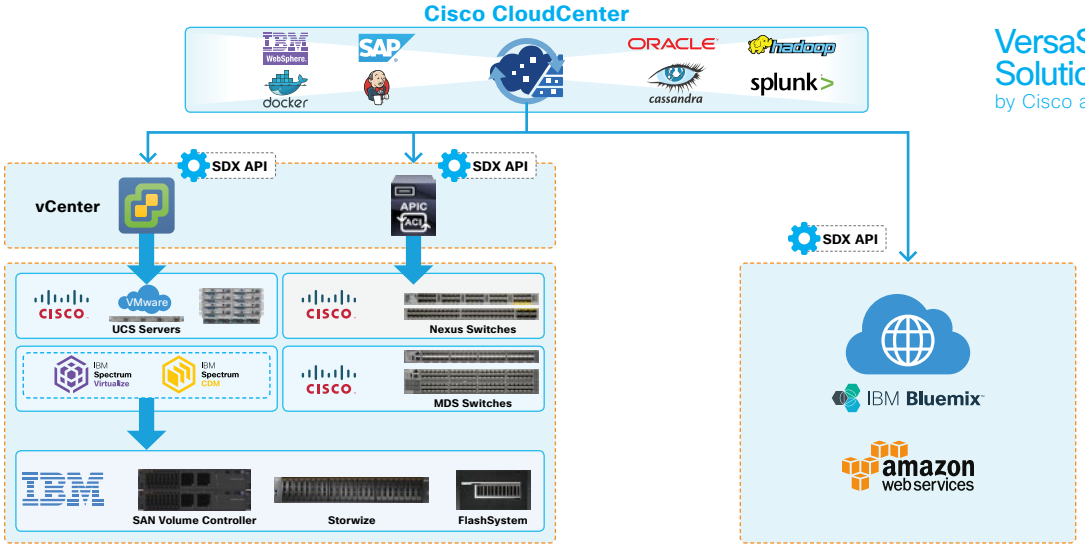
BUSINESS CHALLENGES

- **Operational complexity:** Ability to deploy and run applications on-premises or off-premises without modification
- **Inconsistency:** The different formats and opaque private and public cloud environments can induce inconsistencies, and lack of consistent policies which can further erode transparency
- **Visibility and management:** Having same degree of visibility and management as the workloads migrate from one environment to another

SUMMARY

- "Converged cloud" IT infrastructure that allows easy movement of applications across on-premises and cloud environments
- End-to-end copy data management to lower storage capacity requirements and accelerate application development and testing
- IT as a service to balance user self-service on-demand deployment and management in environments with central governance and control
- Capacity utilization optimization with automated standup and teardown of applications

ARCHITECTURE



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Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_hc_ciscocloudcenter_cdm.html

FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5

TECHNICAL HIGHLIGHTS

- Cisco UCS & 6248UP FI running 3.1(3a) and VMware vSphere 6.5d
- Cisco Nexus 93180YC-EX switches with the advanced traffic analysis and management capabilities of Cloud Scale ASICs, deployed in standalone mode to provide 10GbE connectivity and migration to ACI and 40GE as needed
- NetApp SF9608, an iSCSI-based, all-flash storage solution based on the Cisco UCS C220 M4S Server platform

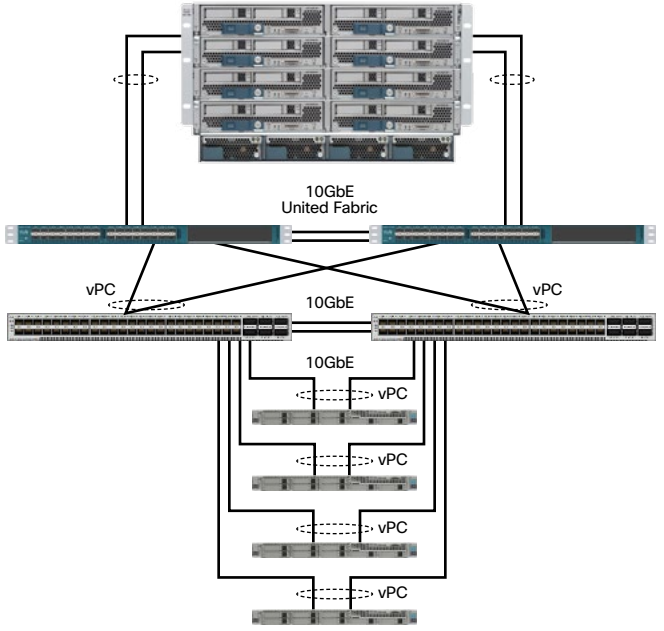
BUSINESS CHALLENGES

- Delivering a next generation data center platform with the agility to support rapidly evolving business needs
- Flexible storage with the scale, performance and automation required for next generation data center and workloads

SUMMARY

- Next generation data center infrastructure for enterprise and cloud deployments with Cisco UCS, Cloud Scale Nexus 9000-EX switches and NetApp SolidFire SF9608 node based, all flash scale-out storage
- Agile, programmable infrastructure for mixed workloads and next generation applications
- Advanced capabilities of Nexus 9000 switches with Cloud Scale ASICs with intelligent buffering, Advanced Traffic Management and Telemetry with no CPU Impact

ARCHITECTURE



UCS Blade Server Chassis, UCS 2200 Series Fabric Extenders and UCS B-Series Blade Servers

UCS 6248UP Fabric Interconnects

Nexus 93180YC-EX

NetApp SolidFire Nodes (SF9608 - Based on C220M4S Servers)

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpodsf_esxi65.html
Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpodsf_esxi65design.html

Hadoop as a Service on BareMetal with UCS Director Express (UCSDE) for Big Data on Cisco UCS Integrated Infrastructure for Big Data and Cisco ACI

TECHNICAL HIGHLIGHTS

- The base configuration consists of 1 UCSDE management node and 80 Hadoop nodes with SFF/LFF drives. This solution could be scaled further just by adding nodes ideally in sets of 16 Cisco UCS C240 M4 servers
- Up to 80 servers (5 racks) can be supported with no additional switching in a single Cisco UCS domain with no network over-subscription

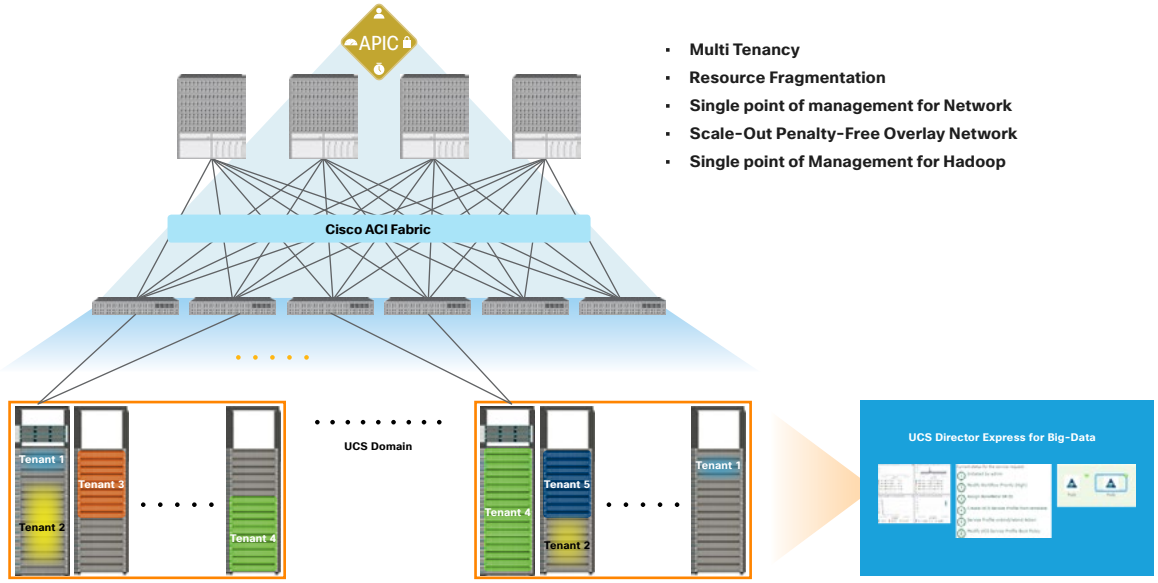
BUSINESS CHALLENGES

- Data center's biggest challenge is the provisioning and managing of the large number of Hadoop nodes
- Consolidating multiple-Hadoop clusters in a single, centrally managed physical cluster to improve infrastructure utilization, and provide access controls and security isolation between tenants

SUMMARY

- Cisco UCSDE provides centralized visibility into the complete infrastructure and big data application to identify potential failures and latent threats before they affect application and business performance
- ACI provides centralized visibility to the entire network with deep telemetry and real-time network health status for each tenant
- Cisco UCS Integrated Infrastructure for Big Data with ACI, offers a linearly scalable architecture and simplification of essential operations for single-rack and multiple-rack deployments spanning thousands of servers

ARCHITECTURE



- **Multi Tenancy**
- **Resource Fragmentation**
- **Single point of management for Network**
- **Scale-Out Penalty-Free Overlay Network**
- **Single point of Management for Hadoop**

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HaaS_on_Bare_Metal_with_UCSDExpress_on_Cisco_UCS_Integrated_Infrastructure_for_Big_Data_and_ACI.html

FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)

TECHNICAL HIGHLIGHTS

- Cisco UCS Director
- Cisco Application Infrastructure Controller
- Cisco UCS Manager
- NetApp Clustered Data ONTAP
- VMware vCenter server
- Extension to FlexPod with Nexus 9000 ACI architecture

BUSINESS CHALLENGES

- Complex infrastructures spanning physical and virtual
- Slow and costly provisioning and de-provisioning of application infrastructure resources
- Manual processes across end-to-end converged infrastructure elements
- Simplifying and extending complex capabilities to end-users through self-service models

SUMMARY

- End-to-end automation across complete physical and virtual infrastructure
- Example customer use-cases and how to deliver automation through various Cisco UCS Director tools and features
- Downloadable UCS Director workflows for quick enablement

ARCHITECTURE

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_52_aci.pdf
Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi55u2_n9k_aci_design.pdf

FlexPod with Cisco UCS Director and Nexus 9000 Standalone

TECHNICAL HIGHLIGHTS

- Nexus 9000 Standalone
- Policies based provision using UCS Director 5.1
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2(2c) supporting direct fabric interconnect attached C-series
- Automated physical server provisioning with iSCSI boot support

BUSINESS CHALLENGES

- Slow, complex, and costly management and maintenance
- Long configuration cycle
- Inflexible infrastructure
- Secure multi-tenancy support

SUMMARY

- Fully automated converged infrastructure and business services
- Unprecedented time and cost savings
- Increased operational efficiency and agility through orchestration
- Predictable and consistent
- Rapid application deployment along with hardware provisioning

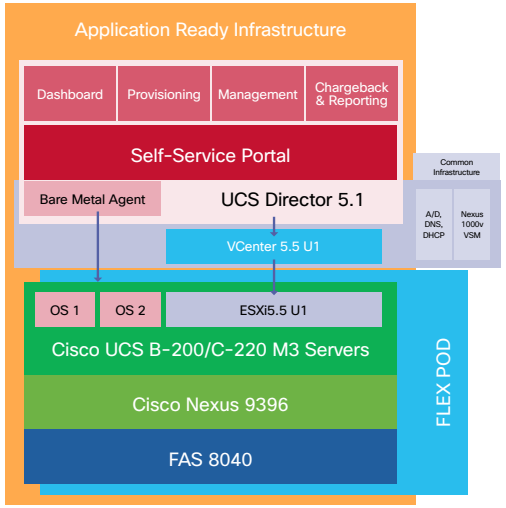
ARCHITECTURE

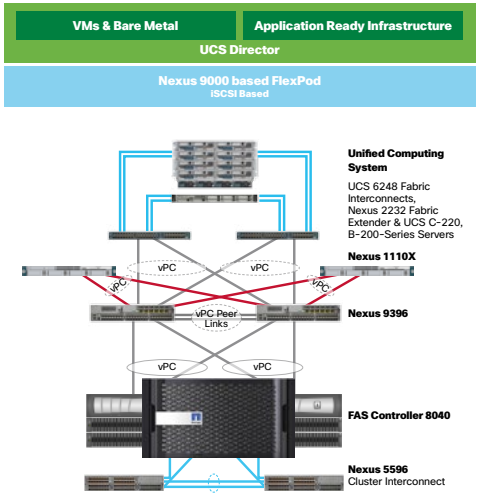
UCS Director 5.1

UCS B-Series and C-Series

9396 TOR Switches

NetApp FAS 8040 Controllers





CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_51.pdf

VersaStack for Data Center with Cisco UCS Director

TECHNICAL HIGHLIGHTS

- Supports Cisco and non-Cisco devices and technologies in an agnostic manner
- IaaS cloud functionality for virtual and physical server resources with guided setup
- Scalable and shared architecture with resiliency and standard API's

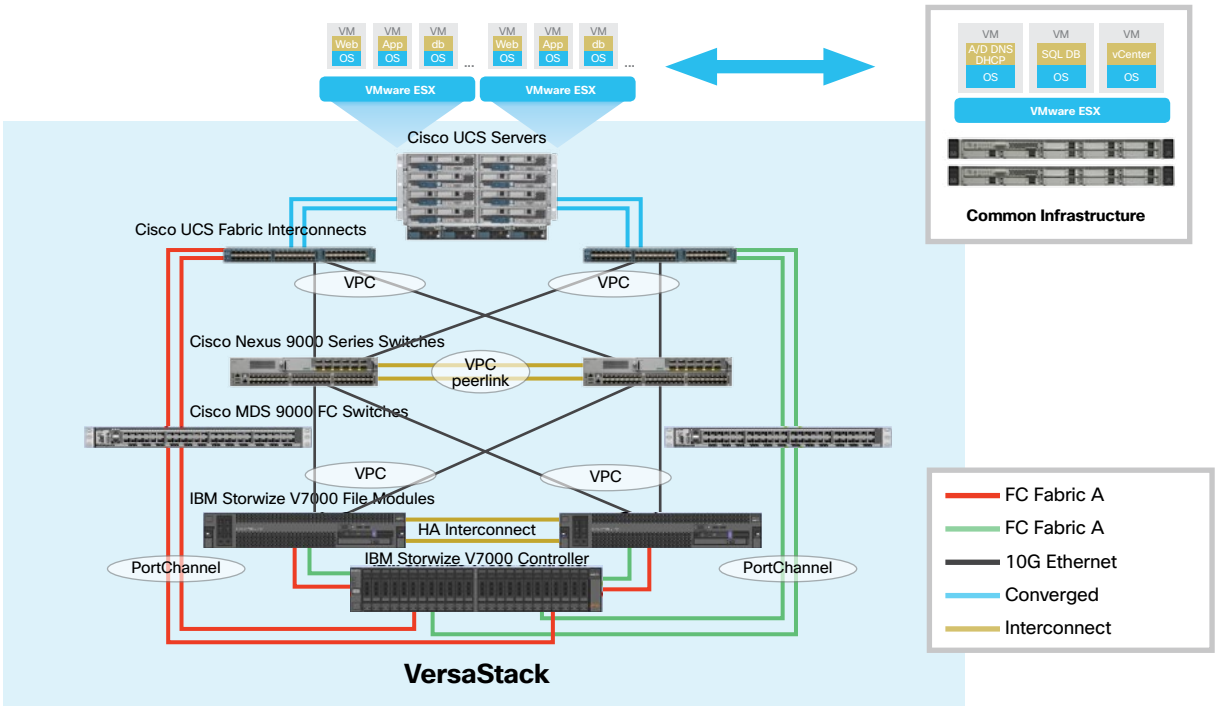
BUSINESS CHALLENGES

- Multiple element managers on integrated stacks
- Efficient and accountable IT resource use – service provider/ cloud model
- API's to integrate with enterprise tools for IT service management (ITSM)

SUMMARY

- Simple, efficient and scalable solution for any converged/integrated stack
- IaaS cloud delivery with features of orchestration, chargeback and self-service
- CVD eliminates risk and leverages Cisco UCS and IBM Storwize efficiencies for an optimal platform

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n9k_vmw55_ucsd.html

Infrastructure | Converged

FLEXPOD

VMware: Infrastructure

- FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and Fibre Channel
- FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and IP-Based Storage
- FlexPod Datacenter with Cisco ACI and VMware 6.0U1
- FlexPod Datacenter with Cisco UCS 6300 Fabric Interconnect and VMware vSphere 6.0 U1
- FlexPod Datacenter with VMware vSphere 6.0 and Fiber Channel
- FlexPod Datacenter with Cisco UCS Mini and VMware vSphere 6.0 with IP-Based Storage
- FlexPod with All Flash FAS, Cisco ACI and vSphere 5.5U2
- FlexPod Datacenter with VMware vSphere 6.0
- FlexPod Datacenter with vSphere 5.5 Cisco UCS Mini and IP-Based Storage
- FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI
- FlexPod with Cisco UCS Director and Nexus 9000 Standalone
- FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1
- FlexPod Datacenter with vSphere 5.5U1
- FlexPod Datacenter with vSphere 5.1U1 and Cisco Nexus 9000 ACI
- vSphere 5.1 on FlexPod with the Nexus 7000
- vSphere 5.1 on FlexPod with Nexus 7000 using FCoE
- Multisite FlexPod with Nexus 7000 and NetApp MetroCluster
- vSphere 5.1U1 Built on FlexPod
- vSphere 5.1U1 Built on FlexPod with Nexus 6000

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and Fibre Channel

TECHNICAL HIGHLIGHTS

- UCS 6300 Fabric Interconnect, Nexus 9000, and NetApp AFF-A300 providing 40 GE end-to-end IP connectivity and 16 Gb FC with MDS 9148s (10 GE and 8 Gb FC with UCS 6200)
- NetApp All Flash FAS (AFF) with Clustered Data ONTAP 9.1 delivering 8/16 Gb FC, 10 Gb FCoE Direct Connect and 10/40 Gb NFS storage solutions
- New FlexPod Datacenter best practices for VMware vSphere 6.5

BUSINESS CHALLENGES

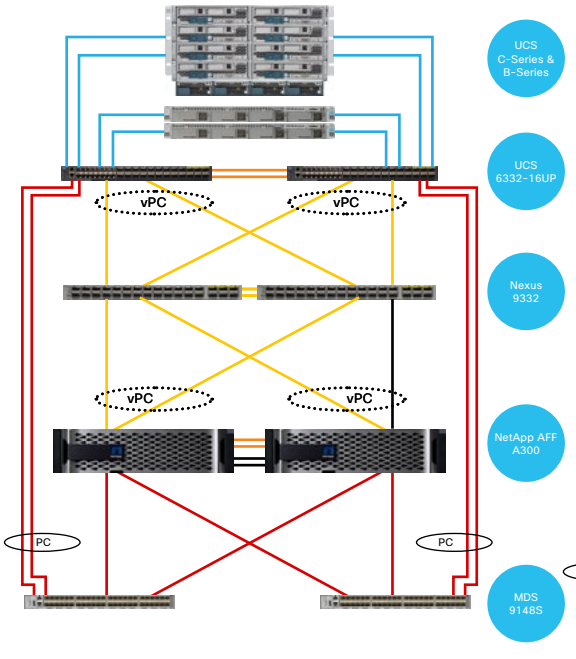
- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

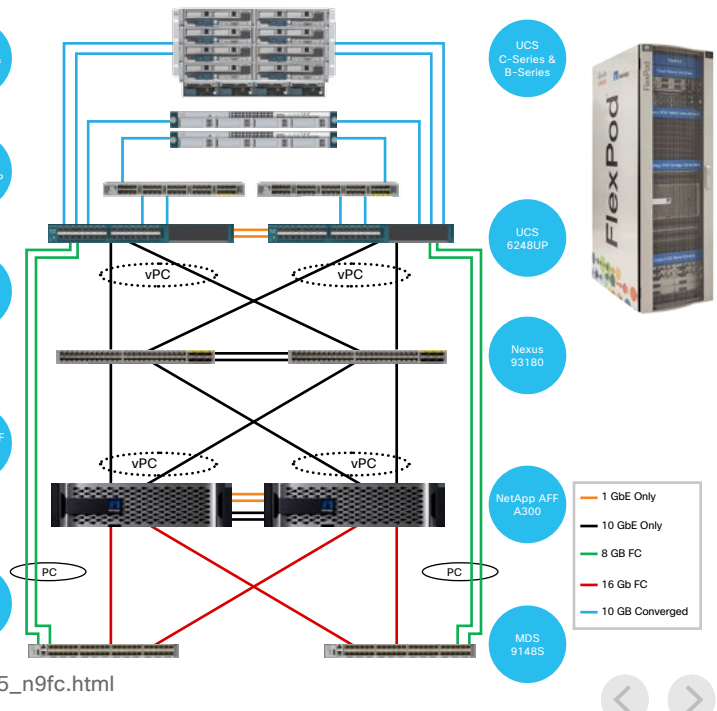
- Converged infrastructure for the next-generation data center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation



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FlexPod Datacenter with VMware vSphere 6.5, NetApp AFF A-series and IP-Based Storage

TECHNICAL HIGHLIGHTS

- UCS 6300 Fabric Interconnect, Nexus 9000, and NetApp AFF-A300 providing 40 GE end-to-end IP connectivity (10 GE with UCS 6200)
- NetApp All Flash FAS (AFF) A300 with Clustered Data ONTAP 9.1 delivering ISCSI and NFS storage and 40 GE connectivity
- New FlexPod Datacenter best practices for VMware vSphere 6.5

BUSINESS CHALLENGES

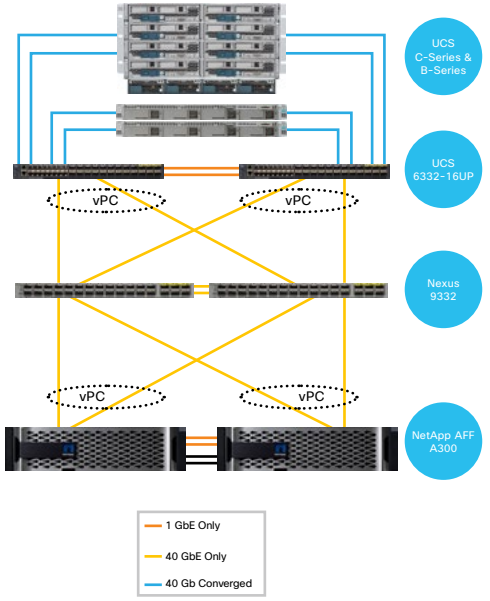
- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

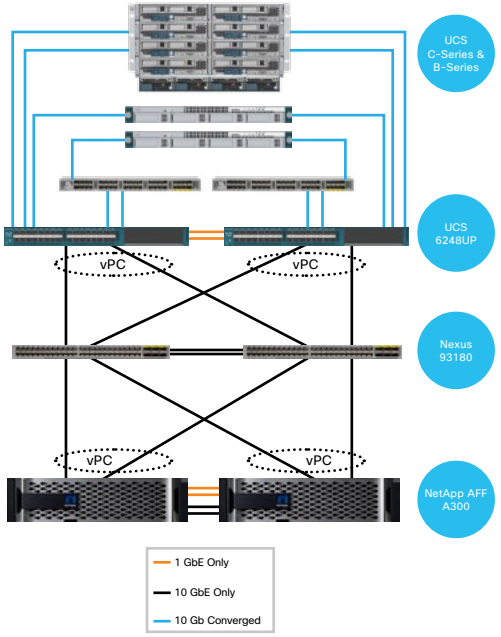
- Converged infrastructure for the next-generation data center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation



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FlexPod Datacenter with Cisco ACI and VMware 6.0U1

TECHNICAL HIGHLIGHTS

- Developed with best practices from Cisco, NetApp, and VMware
- Scalable with any UCS blade server and platform
- Scalable across NetApp AFF/FAS product family
- Integrated physical and virtual machine management
- Close integration with Cisco Application Policy Infrastructure Controller (APIC)

BUSINESS CHALLENGES

- Provide a secure, shared infrastructure
- Minimize operational expenses
- Ability to rapidly and flexibly deliver IT services
- Minimize integration and configuration costs

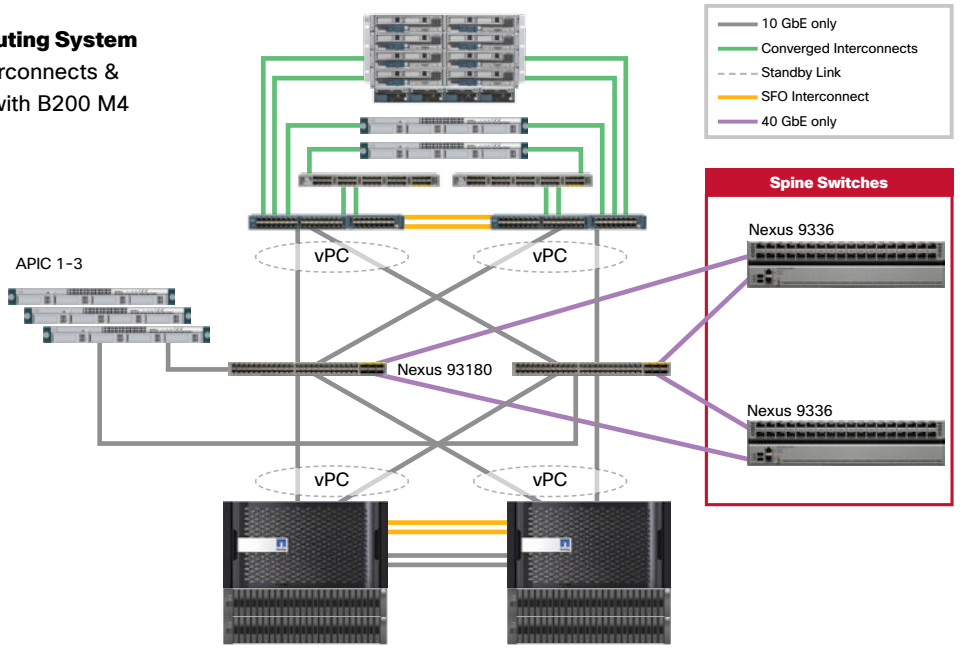
SUMMARY

- Proven and validated solution
- Streamlined installation following detailed CVD
- Secure tenant separation/security at every layer of the stack
- Highly scalable

ARCHITECTURE

Cisco Unified Computing System
UCS 6248 Fabric Interconnects &
5108 Blade Chassis with B200 M4

Cisco ACI Fabric
APIC, Nexus 9300



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FlexPod Datacenter with Cisco UCS 6300 Fabric Interconnect and VMware vSphere 6.0 U1

TECHNICAL HIGHLIGHTS

- UCS 3.1 unified software release provides unified, embedded management of all software and hardware components of the UCS system
- UCS 6300 Fabric Interconnect and Nexus 9000 providing 10 and 40 GE connectivity
- NetApp All Flash FAS (AFF) with clustered Data ONTAP 8.3.2 delivering ISCSI and UCS direct attached fibre channel storage solution

BUSINESS CHALLENGES

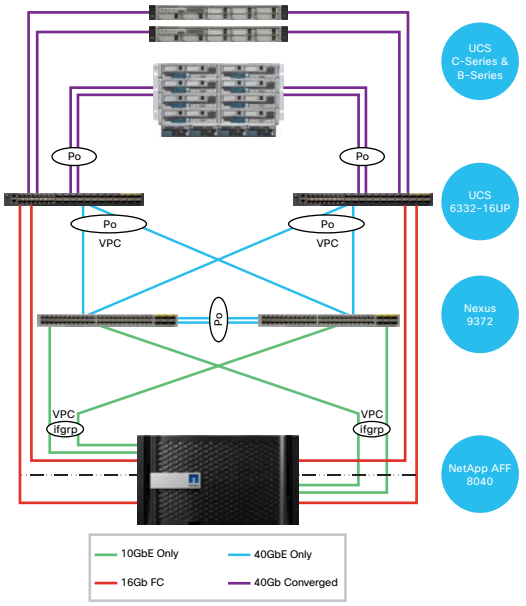
- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

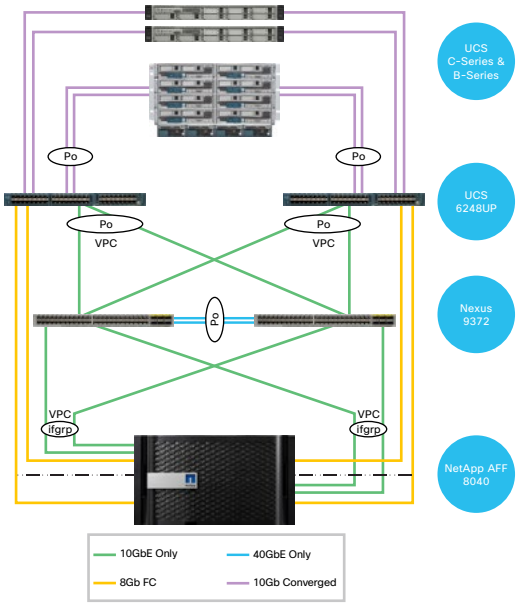
- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation



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FlexPod Datacenter with VMware vSphere 6.0 and Fiber Channel

TECHNICAL HIGHLIGHTS

- Addition of Cisco MDS to FlexPod provides highly scalable fiber channel switching for SAN boot and application data
- UCS 6200 and 6300 Fabric Interconnects and Nexus 9000 providing 10 and 40 GE connectivity
- NetApp All Flash FAS (AFF) with clustered Data ONTAP 9.0 delivering fiber channel and NFS storage capabilities

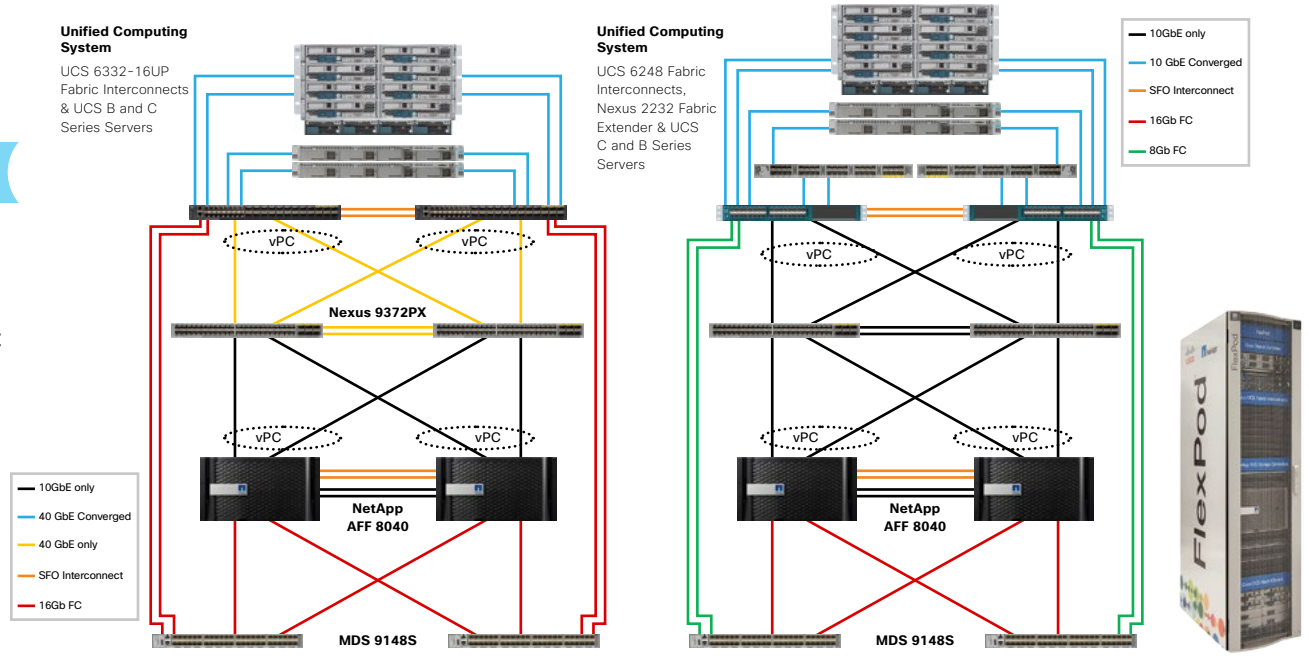
BUSINESS CHALLENGES

- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE



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FlexPod Datacenter with Cisco UCS Mini and VMware vSphere 6.0 with IP-Based Storage

TECHNICAL HIGHLIGHTS

- Cisco Unified Computing System (Cisco UCS) Mini
- New integrated Fabric Interconnect and 110V power supplies
- Management, networking and storage control embedded in the chassis
- NetApp fabric-attached storage (FAS) systems 2500 Series directly connected

BUSINESS CHALLENGES

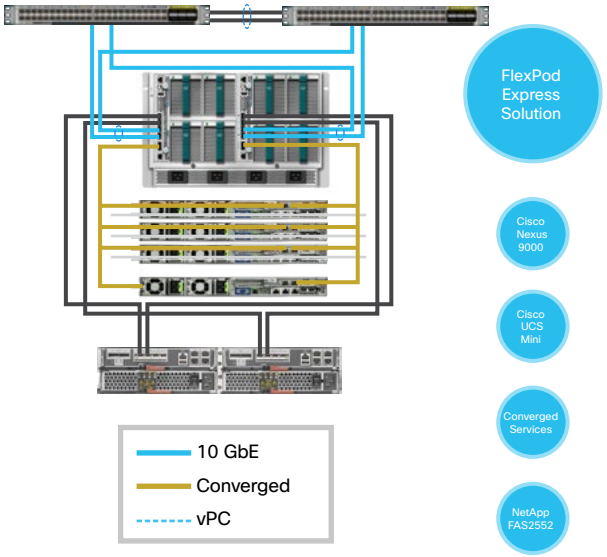
- **Reducing cost:** to reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- **Supporting business requirements:** to create a more flexible and agile infrastructure
- **Reducing time-to-market:** to enable rapid deployment of new services quickly

SUMMARY

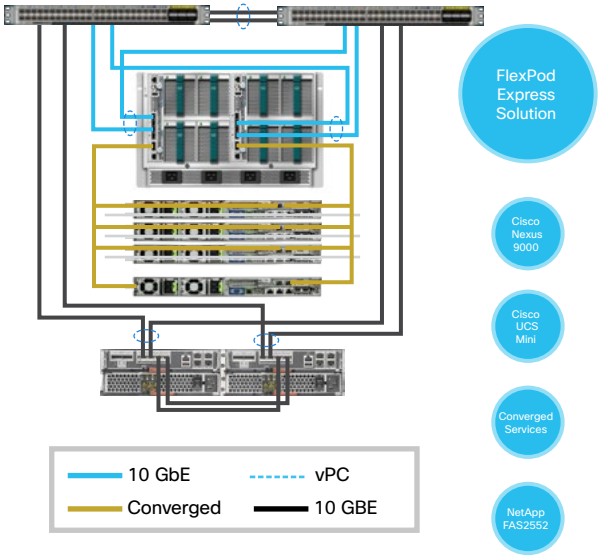
- Consistent management with appropriate scale from the edge of the network to the data center
- FlexPod Infrastructure for uses cases including app workloads such as Exchange 2010, VCC, SAP, MS SQL
- FlexPod Data Center for Enterprises and Service Providers with small failure domain requirements

ARCHITECTURE

Direct Connect IP Solution



IP Based Data Center Solution



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Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_ucsmini_design.pdf

FlexPod with All Flash FAS, Cisco ACI and vSphere 5.5U2

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp All Flash FAS 8000 with Cluster Data ONTAP 8.3
- UCS 2.2(3d) supporting direct Fabric Interconnect attached C-series
- Direct Attached storage for FCoE boot support

BUSINESS CHALLENGES

- Slow, complex, expensive application deployment
- Isolated network control
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenancy support
- Applications requiring faster storage response and higher IOPs

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Consistent network policies throughout the DC with enhanced automation capabilities
- High performance all flash storage
- Rapid Application deployment

ARCHITECTURE

UCS B-Series and C-Series

3 Node APIC Cluster

9396 TOR Switches

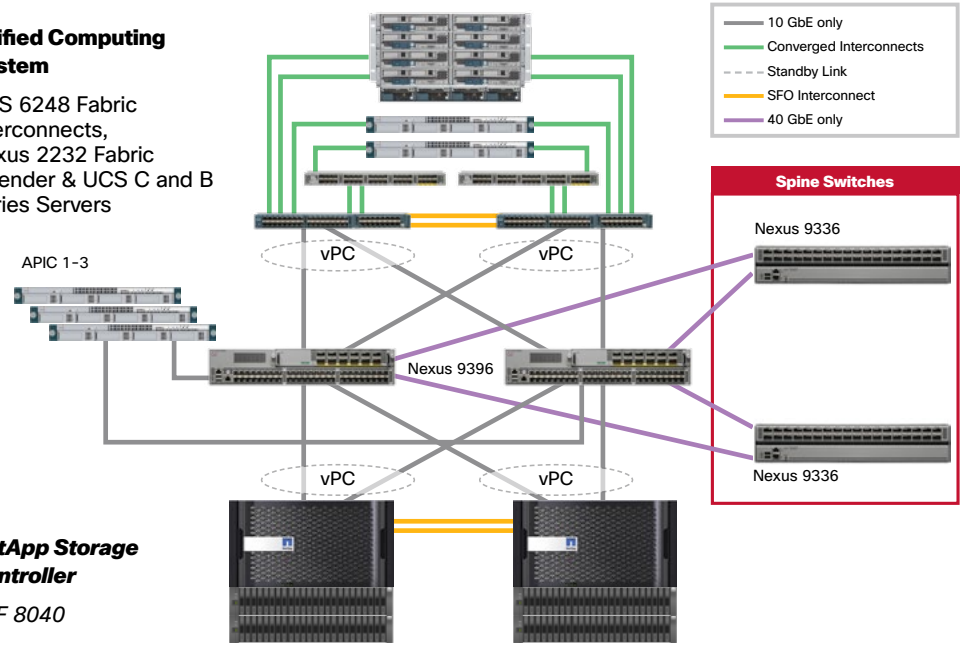
NetApp AFF 8040 Controllers

Unified Computing System

UCS 6248 Fabric Interconnects, Nexus 2232 Fabric Extender & UCS C and B Series Servers

NetApp Storage Controller

AFF 8040



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FlexPod Datacenter with VMware vSphere 6.0

TECHNICAL HIGHLIGHTS

- NetApp All Flash FAS (AFF)
- UCS2.2(5b)
- Nexus 9000 supports low latency 10 GE & 40 GE switching
- iSCSI solution
- vSphere 6.0 support
- NetApp clustered Data ONTAP 8.3.1

BUSINESS CHALLENGES

- Siloed network, compute, storage
- Inefficient resources
- Slow, complex, expensive operations
- Application restraints
- Energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient system

ARCHITECTURE

Cisco UCS C220 M4
C-Series Server(s)

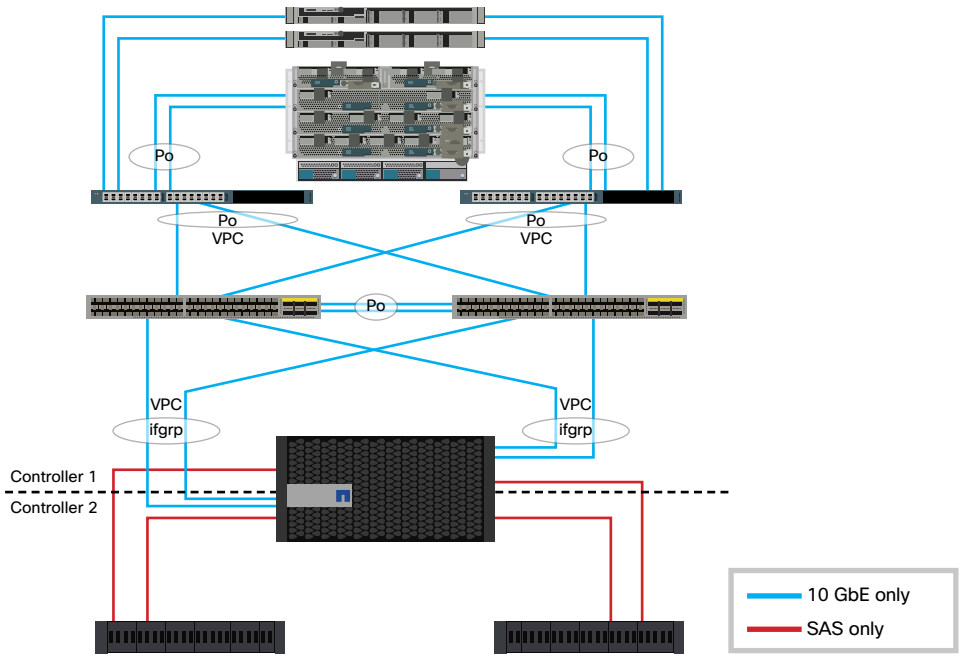
Cisco UCS 5108 B-Series
Blade Chassis 2208XP
Chassis FEX Modules B260
and B460 M4 Blade(s)

isco UCS 6248UP
abric Interconnects

Cisco Nexus
9372PX Switches

NetApp All Flash FAS8060
Storage Controllers
with HA Backplane in
switchless configuration

NetApp DS2246
Disk Shelves



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FlexPod Datacenter with vSphere 5.5 Cisco UCS Mini and IP-Based Storage

TECHNICAL HIGHLIGHTS

- Cisco Unified Computing System (Cisco UCS) Mini
- New integrated fabric interconnect and 110V power supplies
- Management, networking and storage control embedded in the chassis
- NetApp fabric-attached storage (FAS) systems 2500 Series directly connected

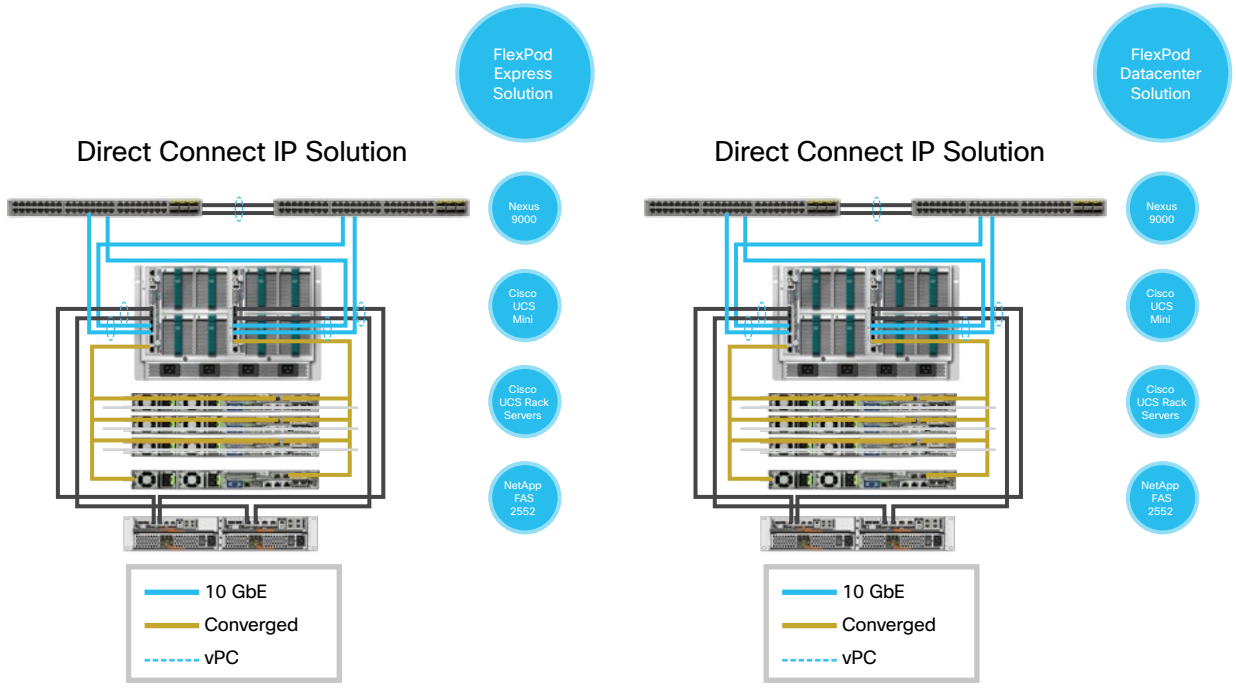
BUSINESS CHALLENGES

- **Reducing cost:** to reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- **Supporting business requirements:** to create a more flexible and agile infrastructure
- **Reducing time-to-market:** to enable rapid deployment of new services quickly

SUMMARY

- Consistent management with appropriate scale from the edge of the network to the data center
- FlexPod Infrastructure for uses cases including app workloads such as Exchange 2010, VCC, SAP, MS SQL
- FlexPod Datacenter for Enterprises and Service Providers with small failure domain requirements

ARCHITECTURE



CVD Datacenter: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_ucsmini_esxi55_ip.html
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FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)

TECHNICAL HIGHLIGHTS

- Cisco UCS Director
- Cisco Application Infrastructure Controller
- Cisco UCS Manager
- NetApp Clustered Data ONTAP
- VMware vCenter server
- Extension to FlexPod with Nexus 9000 ACI architecture

BUSINESS CHALLENGES

- Complex infrastructures spanning physical and virtual
- Slow and costly provisioning and de-provisioning of application infrastructure resources
- Manual processes across end-to-end converged infrastructure elements
- Simplifying and extending complex capabilities to end-users through self-service models

SUMMARY

- End-to-end automation across complete physical and virtual infrastructure
- Example customer use-cases and how to deliver automation through various Cisco UCS Director tools and features
- Downloadable UCS Director workflows for quick enablement

ARCHITECTURE

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_52_aci.pdf
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FlexPod with Cisco UCS Director and Nexus 9000 Standalone

TECHNICAL HIGHLIGHTS

- Nexus 9000 Standalone
- Policies based provision using UCS Director 5.1
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2(2c) supporting direct fabric interconnect attached C-series
- Automated physical server provisioning with iSCSI boot support

BUSINESS CHALLENGES

- Slow, complex, and costly management and maintenance
- Long configuration cycle
- Inflexible infrastructure
- Secure multi-tenancy support

SUMMARY

- Fully automated converged infrastructure and business services
- Unprecedented time and cost savings
- Increased operational efficiency and agility through orchestration
- Predictable and consistent
- Rapid application deployment along with hardware provisioning

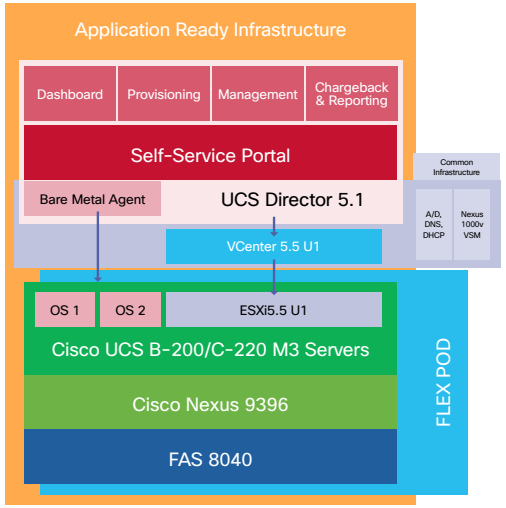
ARCHITECTURE

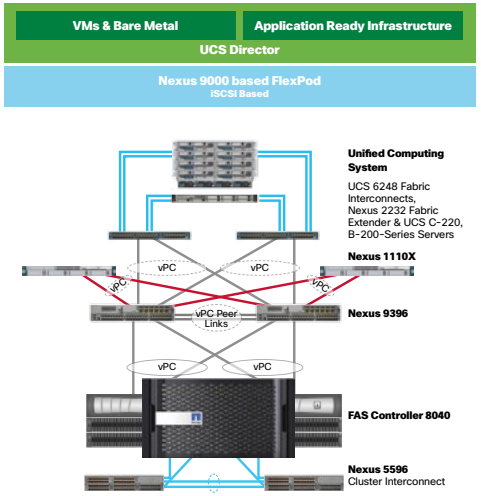
UCS Director 5.1

UCS B-Series and C-Series

9396 TOR Switches

NetApp FAS 8040 Controllers





CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_51.pdf

FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1

TECHNICAL HIGHLIGHTS

- UCS 2.2(2c)
- Nexus 9000 supports low latency 10 GE & 40 GE switching
- iSCSI solution
- vSphere 5.5U1 support
- NetApp clustered Data ONTAP 8.2.1

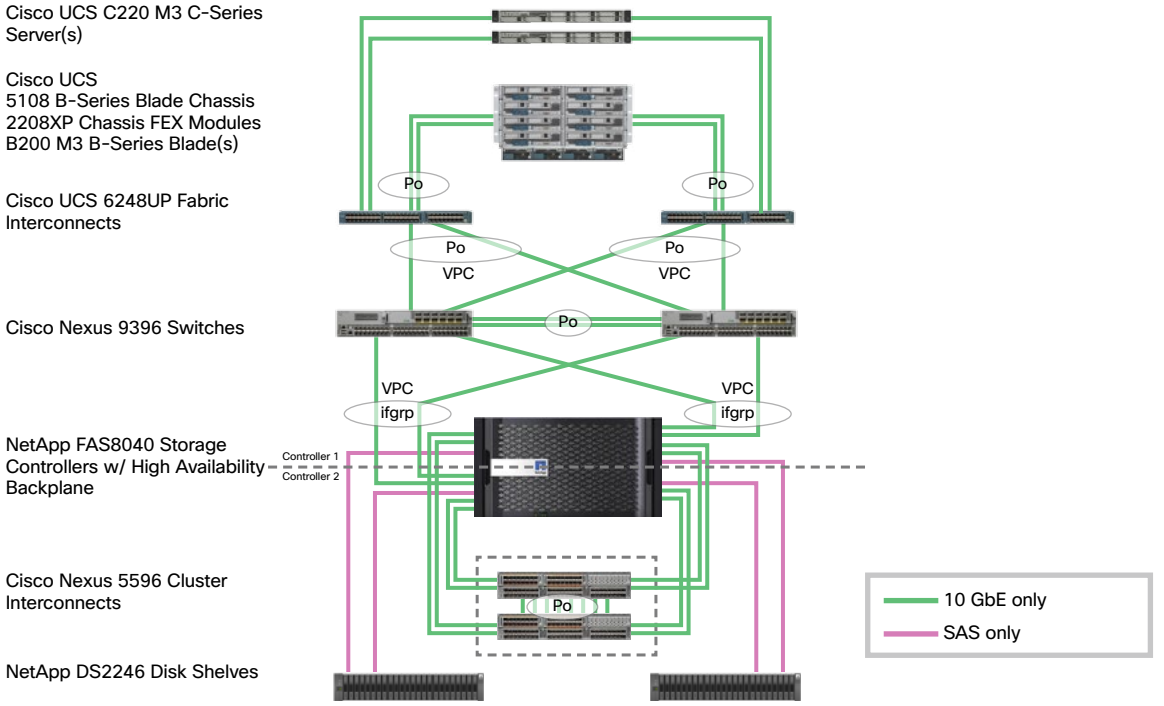
BUSINESS CHALLENGES

- Siloed network, compute, storage
- Inefficient resources
- Slow, complex, expensive operations
- Application restraints
- Energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient system

ARCHITECTURE



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FlexPod Datacenter with vSphere 5.5U1

TECHNICAL HIGHLIGHTS

- UCS 2.2(2c)
- Nexus 5672 supports low latency 10 GE & 40 GE switching and FCoE, VXLAN ready, low hop count
- Multi-hop FCoE
- vSphere 5.5U1 support
- NetApp clustered Data ONTAP 8.2.1

BUSINESS CHALLENGES

- Siloed network, compute, storage
- Inefficient resources
- Slow, complex, expensive operations
- Application restraints
- Energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient system

ARCHITECTURE

Cisco UCS C220 M3 C-Series Server(s)

Cisco UCS
5108 B-Series Blade Chassis
2208XP Chassis FEX Modules
B200 M3 B-Series Blade(s)

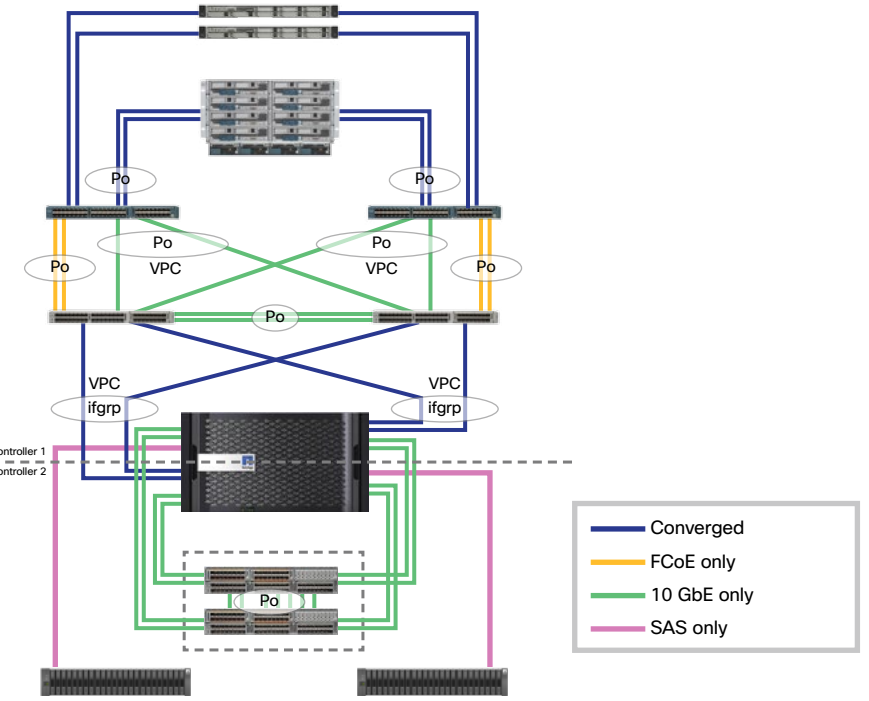
Cisco UCS 6248UP Fabric Interconnects

Cisco Nexus 5548UP or 5672UP Switches

NetApp FAS8040 Storage Controllers w/ High Availability Backplane

Cisco Nexus 5596 Cluster Interconnects

NetApp DS2246 Disk Shelves



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FlexPod Datacenter with vSphere 5.1U1 and Cisco Nexus 9000 ACI

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2(1d) supporting direct fabric interconnect attached C-series
- Direct attached storage for FCoE boot support

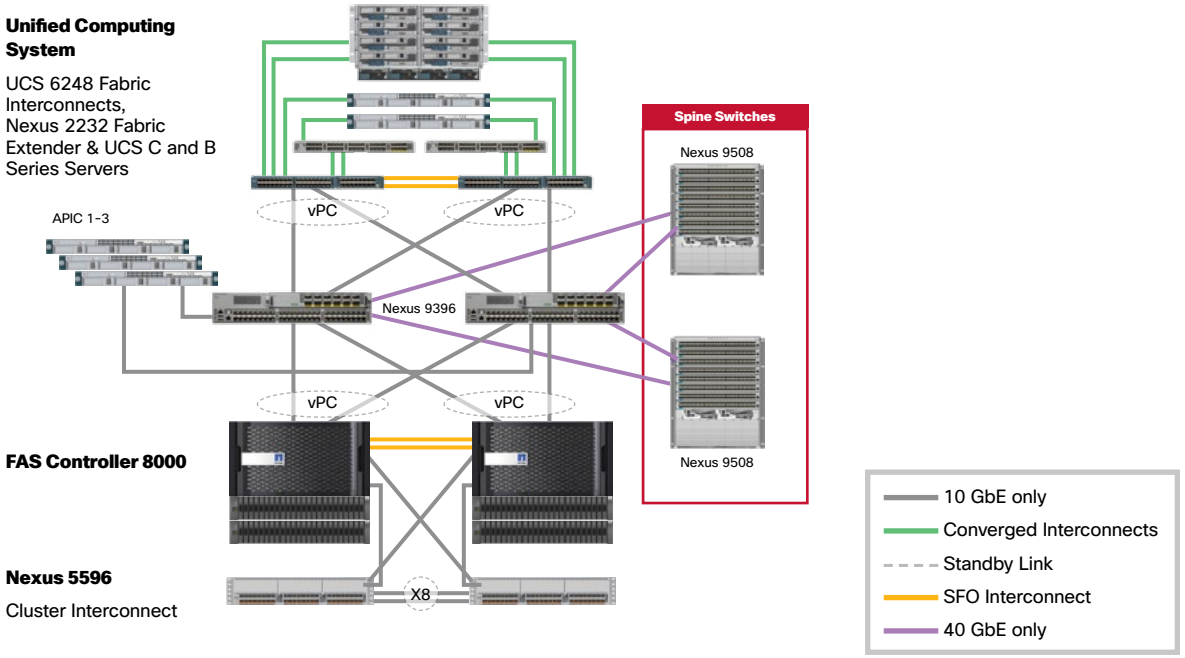
BUSINESS CHALLENGES

- Slow, complex, expensive application deployment
- Isolated network control
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenancy support

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Consistent network policies throughout the DC with enhanced automation capabilities
- Rapid application deployment

ARCHITECTURE



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vSphere 5.1 on FlexPod with the Nexus 7000

TECHNICAL HIGHLIGHTS

- UCS 2.1(1b)
- All-IP solution with iSCSI boot capability in Cisco VIC
- Nexus 7000 with OTV and routing capabilities
- vSphere 5.1 support
- NetApp 7 mode and cluster mode Data ONTAP 8.1

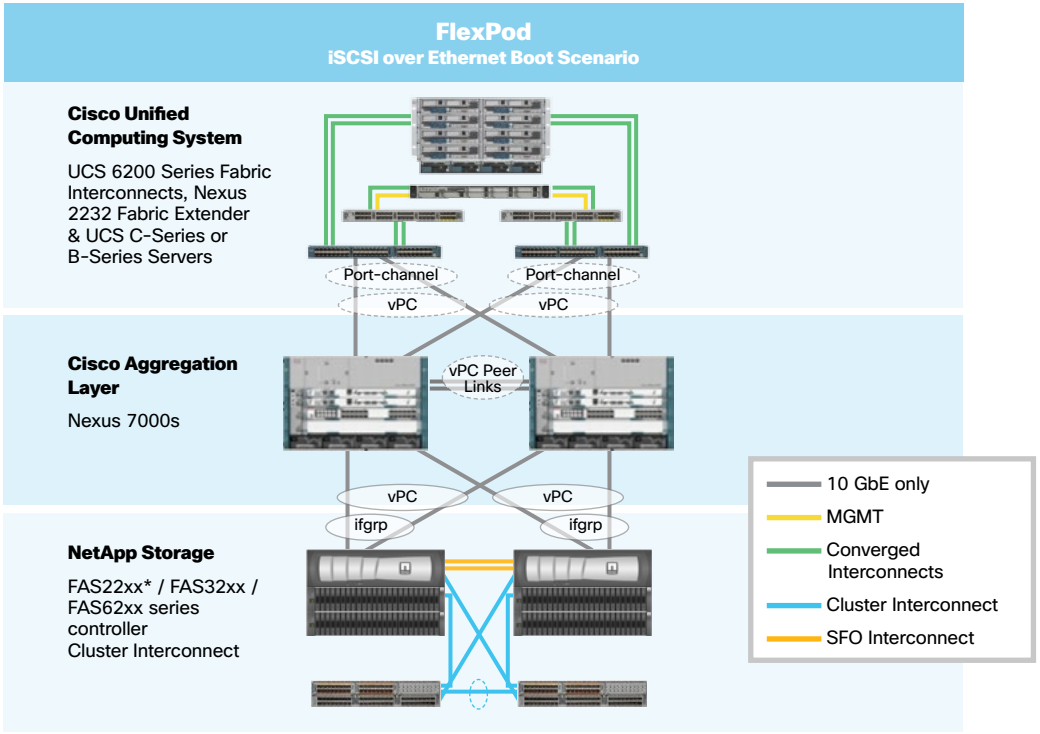
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Inefficient resources
- Slow, complex, and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system

ARCHITECTURE



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vSphere 5.1 on FlexPod with Nexus 7000 using FCoE

TECHNICAL HIGHLIGHTS

- UCS 2.1 (1e)
- Nexus 7000 supporting OTV and routing L3 capabilities
- Multi-hop FCoE
- vSphere 5.1 support
- Deployment guide for both NetApp 7-mode and cluster mode Data ONTAP 8.1.2

BUSINESS CHALLENGES

- Siloed network, compute, storage
- Inefficient resources
- Slow, complex, and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance datacenter environments
- High-performance, scalable, and resilient system

ARCHITECTURE

Cisco Unified Computing System

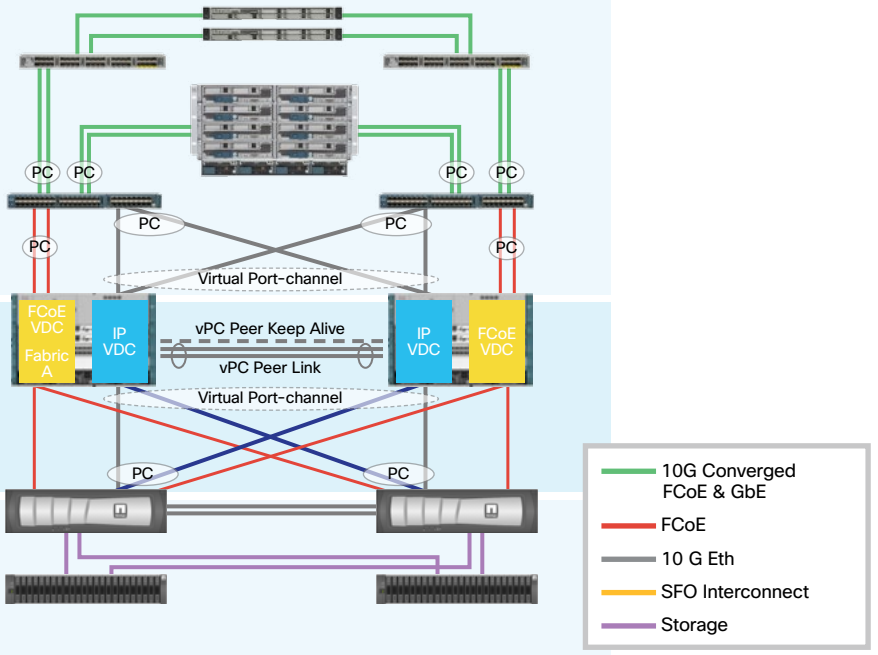
UCS C-Series Servers, Nexus 2232 Fabric Extender, UCS 6200 Series Fabric Interconnects, UCS B-Series Servers

Cisco Network

All Nexus 7000 Chassis, All Supervisors, All Linecards

NetApp Storage

FAS22xx* / FAS32xx / FAS62xx series controller



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Multisite FlexPod with Nexus 7000 and NetApp MetroCluster

TECHNICAL HIGHLIGHTS

- UCS 2.1, vSphere 5.1, N1kv
- Nexus 7000 VDC and OTV
- Multi-hop FCoE
- NetApp MetroCluster on Data ONTAP 8.2
- VMware vMSC
- UCS Central 1.1
- UCS Director 4.0

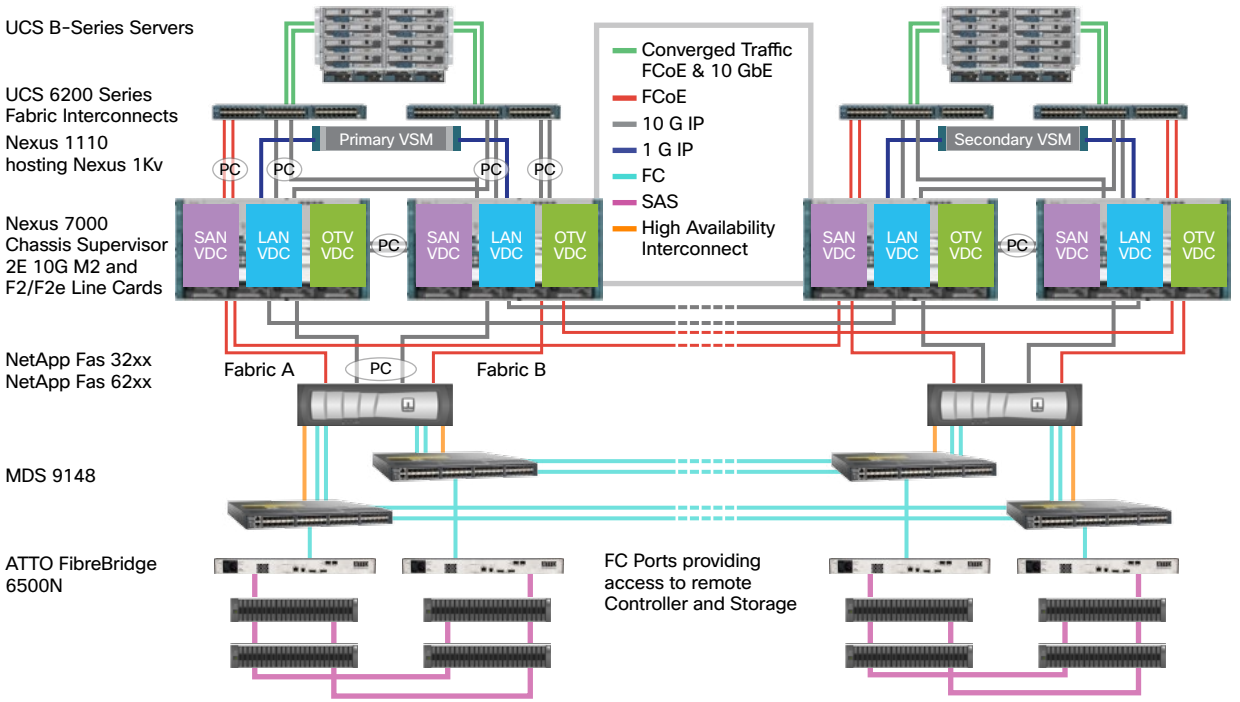
BUSINESS CHALLENGES

- Convoluted cross-site redundancy
- Downtime due to single site failure
- Non-standard DCI architecture
- Ineffective disaster avoidance
- Inefficient workload mobility

SUMMARY

- Converged infrastructure utilizing DCI and multisite clustering solutions
- Disaster and downtime avoidance across two datacenters
- Cross-site automated load distribution
- Seamless workload mobility across the sites
- No single point of failure

ARCHITECTURE



CVD: http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/esxi51_n7k_metrocluster.html

vSphere 5.1U1 Built on FlexPod

TECHNICAL HIGHLIGHTS

- UCS 2.1 (3)
- vSphere 5.1 U1 support
- Deployment guide for both NetApp 7-mode and cluster mode Data ONTAP 8.2P4
- C-Series single connect to FEX

BUSINESS CHALLENGES

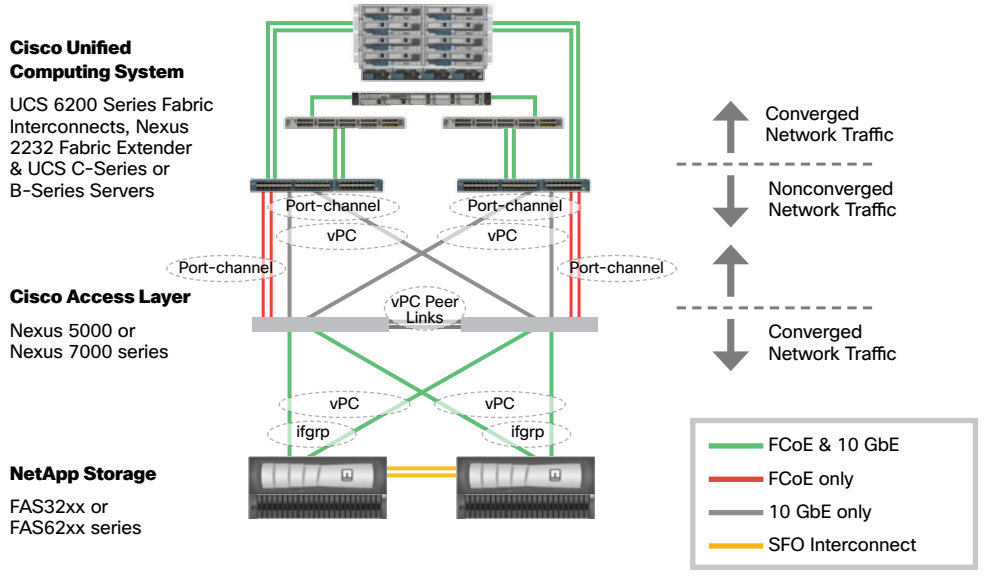
- Siloed network, compute, storage
- Inefficient resources
- Slow, complex, and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system

ARCHITECTURE

FlexPod
Fibre Channel over Ethernet Boost Scenario



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vSphere 5.1U1 Built on FlexPod with Nexus 6000

TECHNICAL HIGHLIGHTS

- UCS 2.1 (3)
- vSphere 5.1 U1 support
- Deployment guide for both NetApp 7-mode and cluster mode Data ONTAP 8.2P4
- Single-connect C-Series to FEX
- Nexus 6001 *NEW*

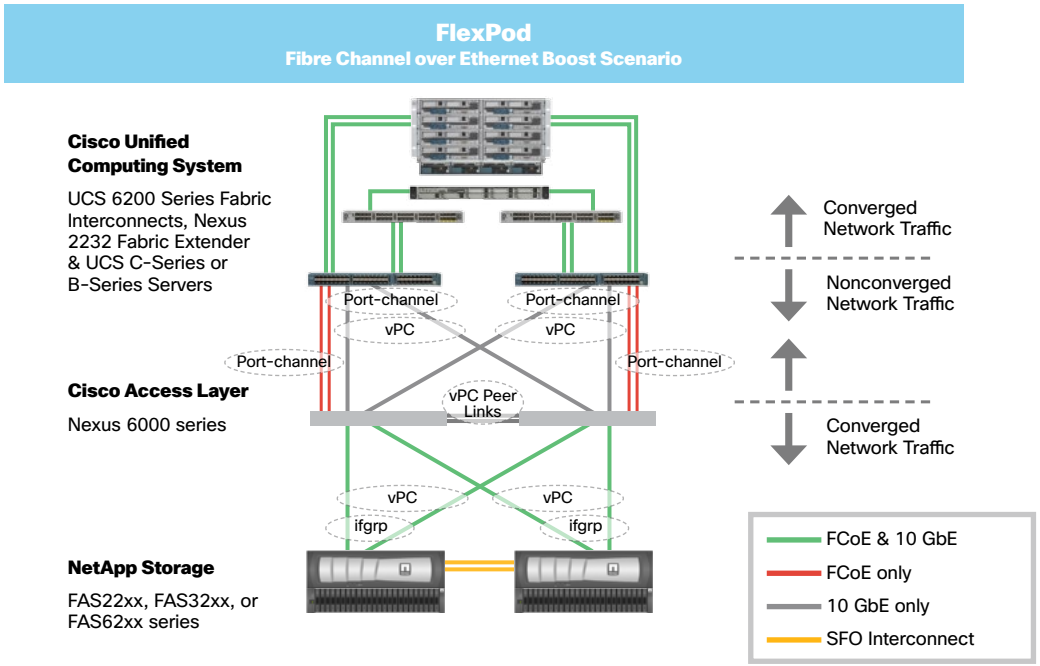
BUSINESS CHALLENGES

- Siloed network, compute, storage
- Inefficient resources
- Slow, complex and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi51_nk6.pdf
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Infrastructure | Converged

FLEXPOD

VMware: Applications

- FlexPod Datacenter for SAP Solution with Clsco ACI
- FlexPod with Microsoft Exchange 2013 on Cisco ACI
- Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

FlexPod Datacenter for SAP Solution with Cisco ACI

TECHNICAL HIGHLIGHTS

- Unifying point of automation and management for Cisco ACI Fabric using Cisco Application Policy Infrastructure Controller (Cisco APIC)
- Implementation of mixed HANA use case. Scale-Up with BareMetal and Virtualization Option, Scale-Out for BareMetal and Suites on HANA
- Scalable Unified storage for iSCSI and NFS traffic. NetApp FAS 8000 Series
- Supports multiple OS Red Hat Enterprise Linux 6.6, SUSE Linux Enterprise Server 11 SP 3

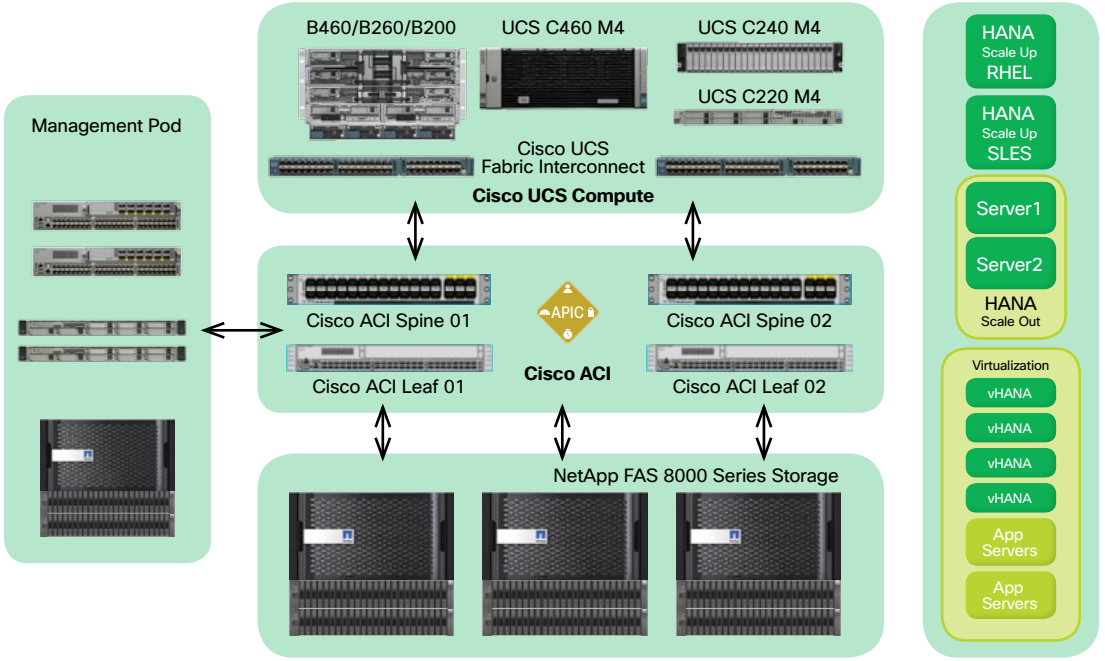
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for Cloud solutions
- Provides architecture for SAP HANA solution efficiently virtualizing various compute option from Cisco UCS servers, Cisco ACI Policy driven Network for varied customer use cases
- Provide a reliable, flexible and scalable reference design

SUMMARY

- Rapid provisioning of SAP HANA using UCS Service Profile, ACI policy-based network, storage clone using NetApp Flexclone
- Cisco APIC optimizes the application lifecycle for scale and performance, and supports flexible application provisioning across physical and virtual resources
- Integration of compute, network and storage solution with vSphere 5.5 for virtualized HANA support
- Multiple HANA instances on shared infrastructure, and application server connecting to HANA DB

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_ACI.html

FlexPod with Microsoft Exchange 2013 on Cisco ACI

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct fabric interconnect attached C-series
- vSphere 5.5 virtualization platform
- Microsoft Exchange 2013

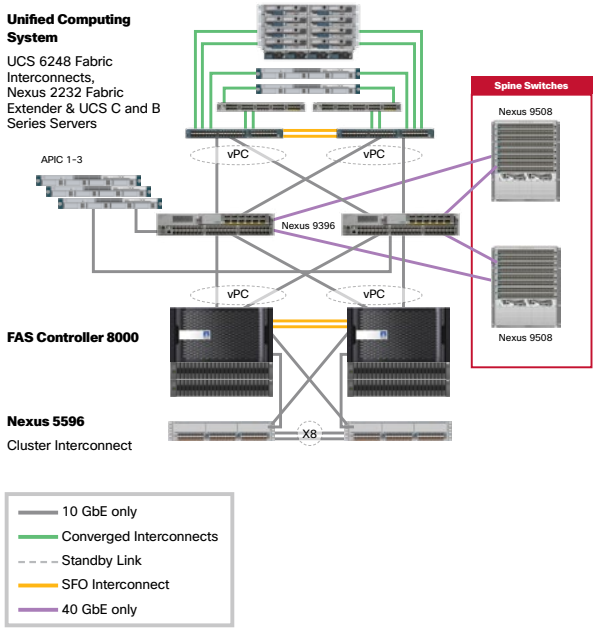
BUSINESS CHALLENGES

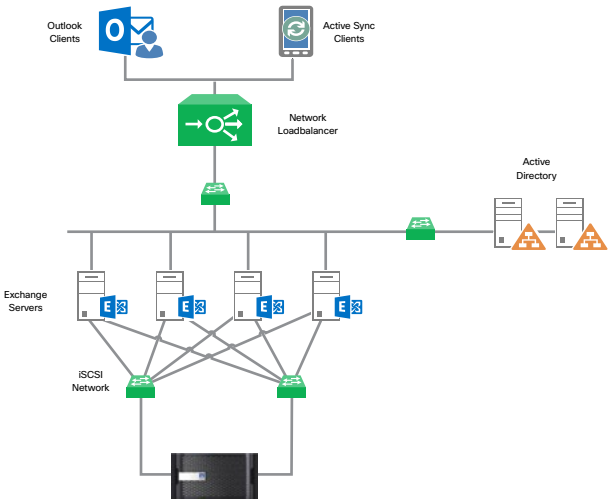
- Scalability and performance issues
- Challenges in business adjacency due to growing enterprises and complexity in managing them
- Time consuming, convoluted, expensive application deployment
- Isolated network regulation
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenant environment

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Consistent network policies throughout the data center with enhanced automation capability
- Rapid Exchange application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE





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Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/exchange2013_aci_flexpod_vmware_design.html

Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct fabric interconnect attached C-series
- Direct attached storage for FCoE boot support
- vSphere 5.1 virtualization platform
- Microsoft SharePoint 2013

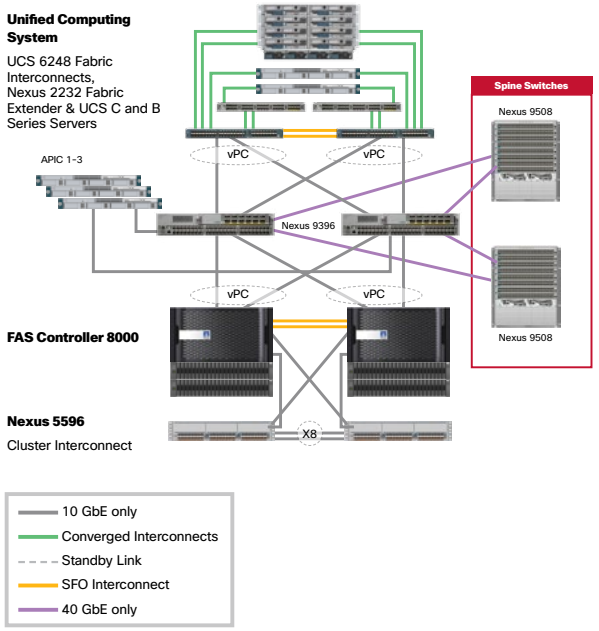
BUSINESS CHALLENGES

- Scalability and performance issues
- Challenges in business adjacency due to growing enterprises and complexity in managing them
- Time consuming, convoluted, expensive application deployment
- Isolated network regulation
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenant environment

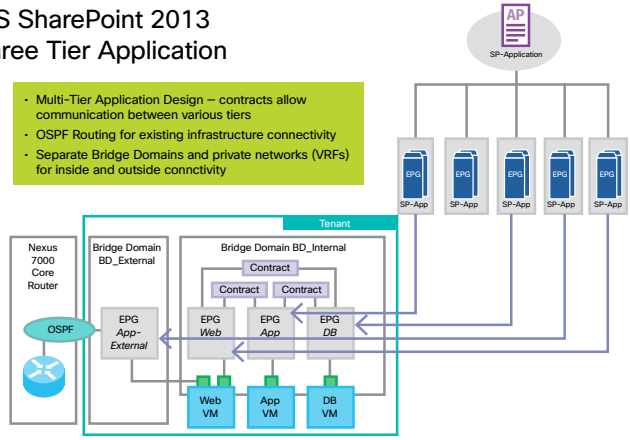
SUMMARY

- Converged infrastructure based on Cisco unified data center
- Consistent network policies throughout the data center with enhanced automation capability
- Rapid SharePoint application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE



MS SharePoint 2013
Three Tier Application



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/sharepoint2013_aci_flexpod_vmware_deploy.pdf
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Infrastructure | Converged

FLEXPOD

VMware: Other

- FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)
- FlexPod with Cisco UCS Director and Nexus 9000 Standalone

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FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco Application Centric Infrastructure (ACI)

TECHNICAL HIGHLIGHTS

- Cisco UCS Director
- Cisco Application Infrastructure Controller
- Cisco UCS Manager
- NetApp clustered Data ONTAP
- VMware vCenter server
- Extension to FlexPod with Nexus 9000 ACI architecture

BUSINESS CHALLENGES

- Complex infrastructures spanning physical and virtual
- Slow and costly provisioning and de-provisioning of application infrastructure resources
- Manual processes across end-to-end converged infrastructure elements
- Simplifying and extending complex capabilities to end-users through self-service models

SUMMARY

- End-to-end automation across complete physical and virtual infrastructure
- Example customer use-cases and how to deliver automation through various Cisco UCS Director tools and features
- Downloadable UCS Director workflows for quick enablement

ARCHITECTURE

CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_52_aci.pdf
Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi55u2_n9k_aci_design.pdf

FlexPod with Cisco UCS Director and Nexus 9000 Standalone

TECHNICAL HIGHLIGHTS

- Nexus 9000 Standalone
- Policies based provision using UCS Director 5.1
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2(2c) supporting direct fabric interconnect attached C-series
- Automated physical server provisioning with iSCSI boot support

BUSINESS CHALLENGES

- Slow, complex, and costly management and maintenance
- Long configuration cycle
- Inflexible infrastructure
- Secure multi-tenancy support

SUMMARY

- Fully automated converged infrastructure and business services
- Unprecedented time and cost savings
- Increased operational efficiency and agility through orchestration
- Predictable and consistent
- Rapid application deployment along with hardware provisioning

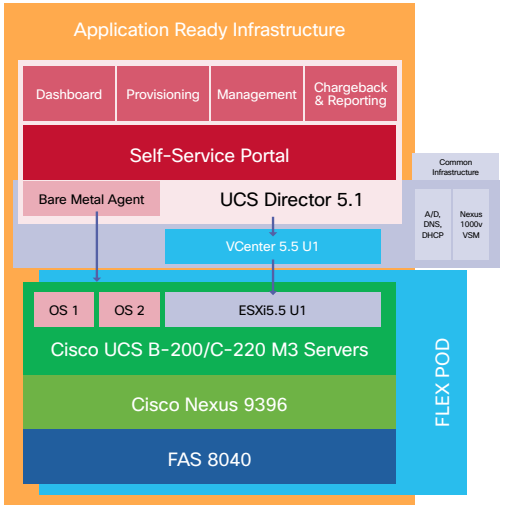
ARCHITECTURE

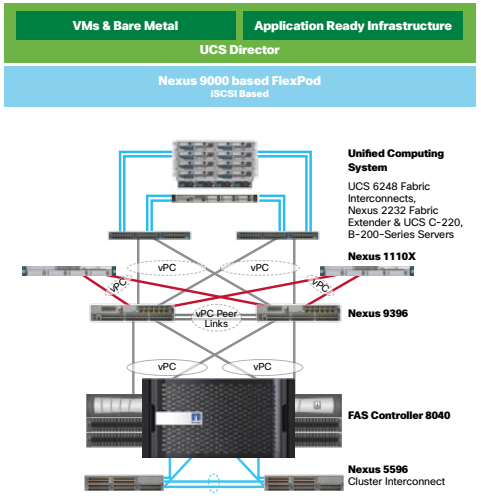
UCS Director 5.1

UCS B-Series and C-Series

9396 TOR Switches

NetApp FAS 8040 Controllers





CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_iaas_ucsd_51.pdf

Infrastructure | Converged

FLEXPOD

Microsoft

- FlexPod with UCS Mini
- FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0
- FlexPod Datacenter with Microsoft Private Cloud Fast Track 3.0

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FlexPod with UCS Mini

TECHNICAL HIGHLIGHTS

- Cisco Unified Computing System (Cisco UCS) Mini
- New integrated fabric interconnect and 110V power supplies
- Management, networking and storage control embedded in the chassis
- NetApp fabric-attached storage (FAS) systems 2500 Series directly connected

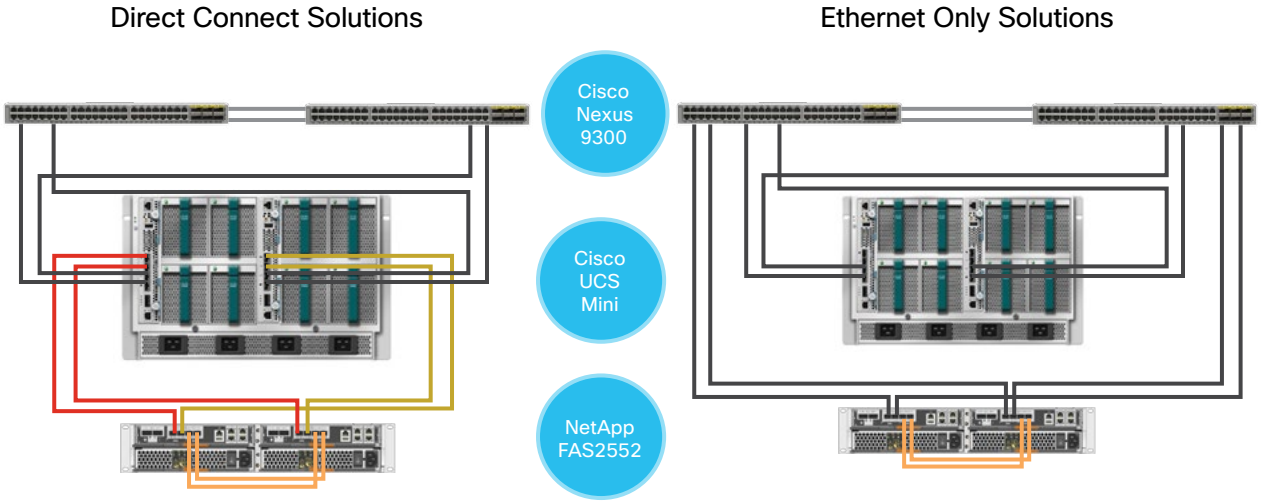
BUSINESS CHALLENGES

- Reducing cost: To reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- Supporting business requirements: To create a more flexible and agile infrastructure
- Reducing time-to-market: To quickly enable rapid deployment of new services

SUMMARY

- Consistent management with appropriate scale from the edge of the network to the datacenter
- FlexPod Express for the ROBO and SMB use cases
- FlexPod Datacenter for Enterprises and Service Providers with small failure domain requirements

ARCHITECTURE



FlexPod Datacenter and Express Models Available

CVD Datacenter: www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_ucsmini_esxi55_fc.pdf
CVD Express: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_express_ucsmini_esxi55_fc.pdf
Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_ucsmini_design.pdf

FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0

TECHNICAL HIGHLIGHTS

- Developed with best practices from Cisco, NetApp, and Microsoft
- Scalable with any UCS blade or rack server
- Scalable across NetApp FAS product family
- Integrated physical and virtual machine management
- Tight integration with Microsoft System Center
- VMM SCOM Orchestrator PowerShell
- Includes Windows Azure Pack and NLB deployment

BUSINESS CHALLENGES

- Reduce server sprawl
- Minimize operational expenses
- Ability to rapidly and flexibly deliver IT services
- Minimize integration and configuration costs

SUMMARY

- Proven and validated solution
- Streamlined installation following detailed CVD
- Enhanced automation with System Center and PowerShell integration
- Microsoft Azure Pack Integrated Infrastructure

ARCHITECTURE

Cisco Unified Computing System
UCS 6248 Fabric Interconnects & 5108 Blade Chassis w/ B200 M4, UCS C-220

Microsoft Hyper-V 2012 R2

System Center 2012 R2

Cisco Access Layer
Cisco Nexus 9396 Switch

Net App Storage
FAS 8000

- Converged Interconnects
- FCoE only
- 10 GbE only
- Cluster Interconnect

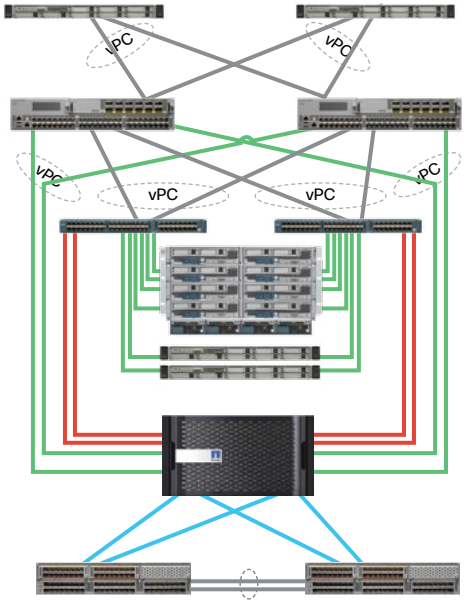
Nexus 1110X

Nexus 9396 ACI Capable Datacenter Switches

Unified Computing System
UCS 6248 Fabric Interconnects, UCS C-220, B-200-Series Servers

FAS 8040 controller

Nexus 5596 Cluster Interconnect



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_mspc40_cmode_n9k.pdf

FlexPod Datacenter with Microsoft Private Cloud Fast Track 3.0

TECHNICAL HIGHLIGHTS

- Microsoft Windows Server 2012 and Microsoft System Center 2012 SP1
- Cisco Nexus® 1000V switch for Hyper-V for advanced networking features
- Hyper-V Virtual Fibre Channel
- NetApp cluster mode Data ONTAP 8.2.1

BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Inefficient resources
- Slow, complex, and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system

ARCHITECTURE

Cisco UCS C220 M3 C-Series Server(s)

Nexus 2232PP FEX

Cisco UCS 5108 Blade Chassis
2204XP Chassis FEX Modules
B200 M3 B-Series Blade(s)

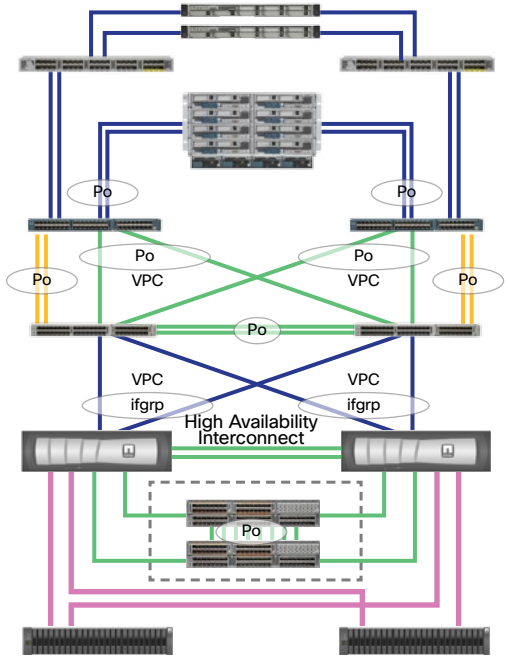
Cisco UCS 6248UP Fabric Interconnects

Cisco Nexus 5548UP Switches

NetApp FAS 3250 Storage Controllers

Cisco Nexus 5596 Cluster Interconnects

NetApp DS2246 Disk Shelves



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Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_mspc_design_cmode.html

Infrastructure | Converged

FLEXPOD

Virtual Client Computing

- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
- FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
- 2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
- 2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

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FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7

TECHNICAL HIGHLIGHTS

- UCS 3.1(1e)
- UCS B200 M4 blades
- NetApp AFF8080EX-A storage system
- NetApp clustered data ONTAP 8.3.2
- Nexus 9372 series switches (standalone)
- Citrix XenApp and XenDesktop (7.7)
- VMware vSphere 6.0 update 1a

BUSINESS CHALLENGES

- Quick provisioning of VCC solution environment
- Dynamic and agile expansion of VCC solution
- Scalability of VCC to support user demand at large scale
- Support for enterprise converged VCC solution

SUMMARY

- Day-zero workflow provisioning support
- Converged infrastructure based on Cisco Unified Data Center
- Mixed VCC and RDS workload scenarios
- CVD introduction to UCS Performance Manager
- Hardware/software level redundancy using Cisco UCS and NetApp Availability features

ARCHITECTURE

Workload

XenApp 7.7
XenDesktop 7.7

Network

2x Nexus 9372 Switches
2x Cisco UCS 6248 Fabric Interconnects

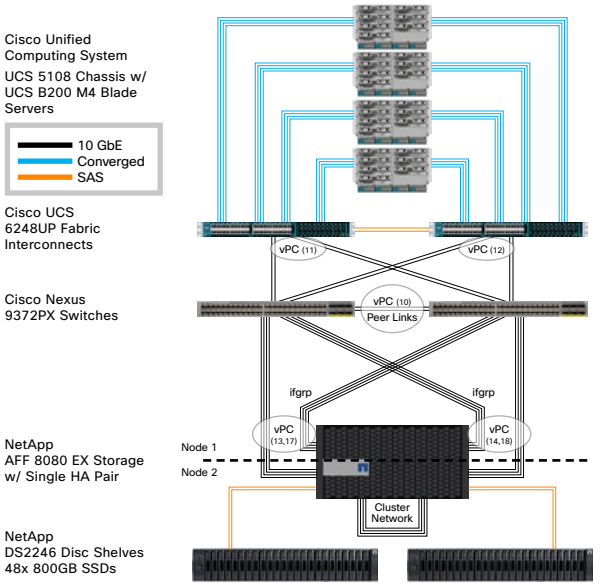
Compute

4x Cisco UCS 5108 Chassis
28x Cisco UCS B200 M4 Blade Server

Storage

NetApp AFF8080EX Storage28x 2x
NetApp DS2246 Disk Shelves 48x 800GB SSDs

FlexPod Datacenter with B200 M4 Blade Servers, AFF8080EX Storage, vSphere 6 U1, and Citrix XenApp/XenDesktop 7.7 for 5000 Seats



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd77esxi60u1_flexpod.html

FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6

TECHNICAL HIGHLIGHTS

- UCS 3.0(2c)
- UCS B200 M4 blades
- NetApp FAS2552 array
- NetApp Clustered Data ONTAP 8.3
- Nexus 9372 series switches (standalone)
- Citrix XenApp and XenDesktop (7.6)
- VMware vSphere 5.5 Update-2

BUSINESS CHALLENGES

- Quick provisioning of VCC solution environment
- Dynamic and agile expansion of VCC solution
- Scalability of VCC to support user demand
- Support for ROBO, converged VCC solution

SUMMARY

- FlexPod Auto-Provisioning support
- Converged infrastructure based on Cisco Unified Data Center
- Mixed VCC and RDS workload scenarios
- Ultra user density with minimum rack space footprint
- Hardware Level Redundancy using Cisco UCS and NetApp Availability features

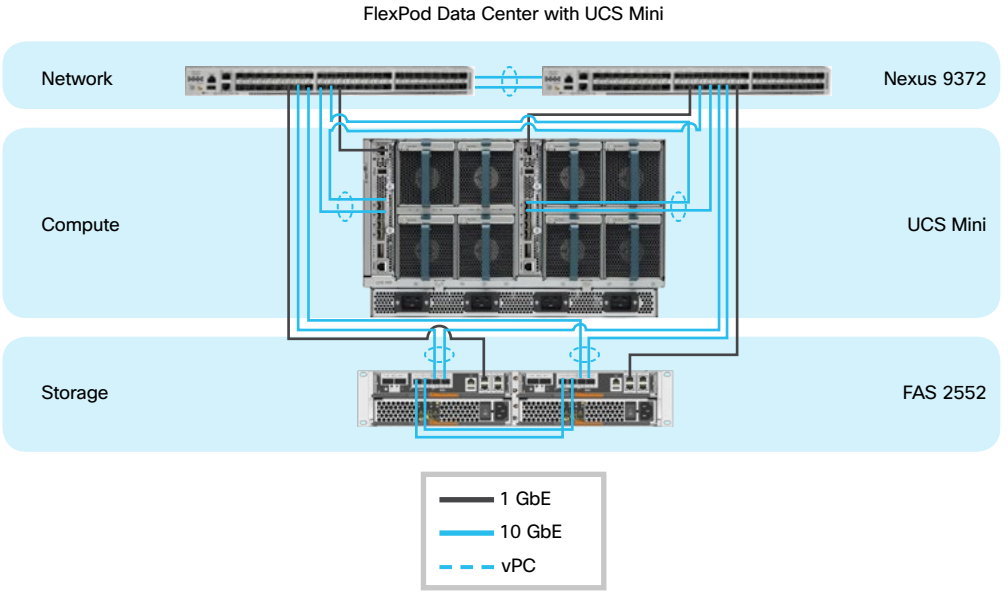
ARCHITECTURE

1 Cisco UCS 5108 mini chassis

7 Cisco UCS B200 M4 blades

2 Cisco UCS 6324 FI

1 NetApp FAS 2552 hybrid storage



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd76esxi55u2_flexpod.html

2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.1 (3a)
- Cisco UCS B200 M3 with Intel E5-2680 v2
- Cisco 6248UP Fabric Interconnect, Nexus 5548UP Layer 2 Switch
- VMware vSphere 5.1
- Citrix XenDesktop 7.1 pooled HVD desktops and RDS Hosted Shared Desktops
- Nexus 1000v for VMware v 4.2 (1) SV2 (2.1a)
- NetApp FAS 3240 Data ONTAP cluster mode

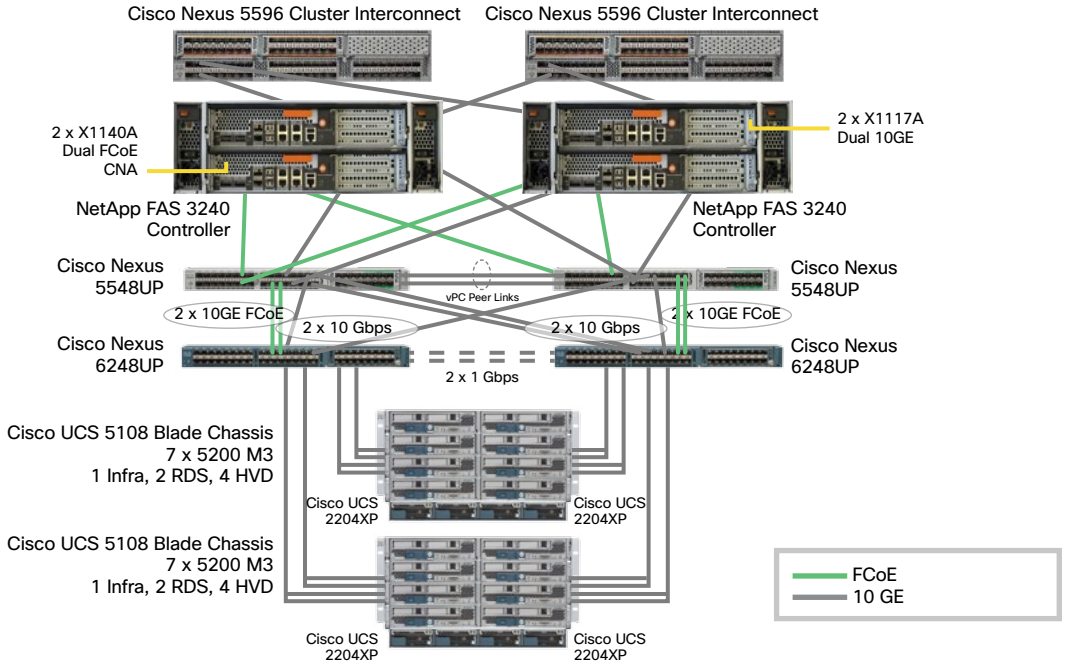
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Complex design and integration
- Scale challenges
- Differing user requirements
- Lack of end-user acceptance

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system
- Rapid boot, rapid login, and support for 2000 mixed-use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd7esxi51_flexpod.pdf

2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.1(3a)
- Cisco UCS B200 M3 with Intel E5-2680 v2
- Cisco 6248UP fabric interconnect, Nexus 5548UP Layer 2 switch
- Citrix XenServer 6.2
- Citrix XenDesktop 7.1 pooled HVD and RDS hosted shared desktops
- NetApp FAS 3250 Data ONTAP C-Mode

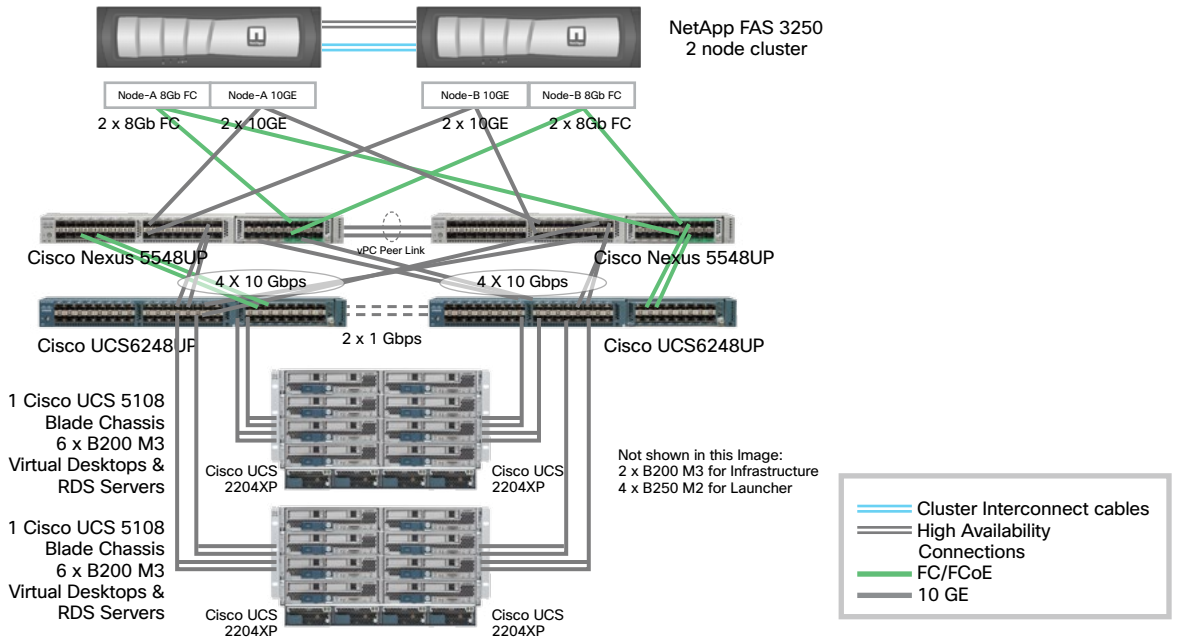
BUSINESS CHALLENGES

- Siloed network, compute, storage
- Complex design and integration
- Scale challenge
- Differing user requirements
- End user acceptance

SUMMARY

- Converged Infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient system
- Rapid boot, rapid login and support for 2000 mixed use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd7esxi51_flexpod.pdf

Infrastructure | Converged

FLEXPOD

Applications

- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series ***- New***
- FlexPod with Microsoft Exchange 2013 on Cisco ACI
- Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod Datacenter for SAP HANA with Nexus 9000
- FlexPod with Oracle RAC
- Oracle JD Edwards on FlexPod

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FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series

TECHNICAL HIGHLIGHTS

- UCS 6300 Fabric Interconnect, Nexus 9000, and NetApp AFF-A300 providing 40 GE end-to-end IP connectivity
- NetApp All Flash FAS (AFF) A300 with clustered data ONTAP 9.2 delivering ISCSI and NFS storage and 40 GE connectivity
- New FlexPod data center best practices for VMware vSphere 6.5 for virtualized implementations

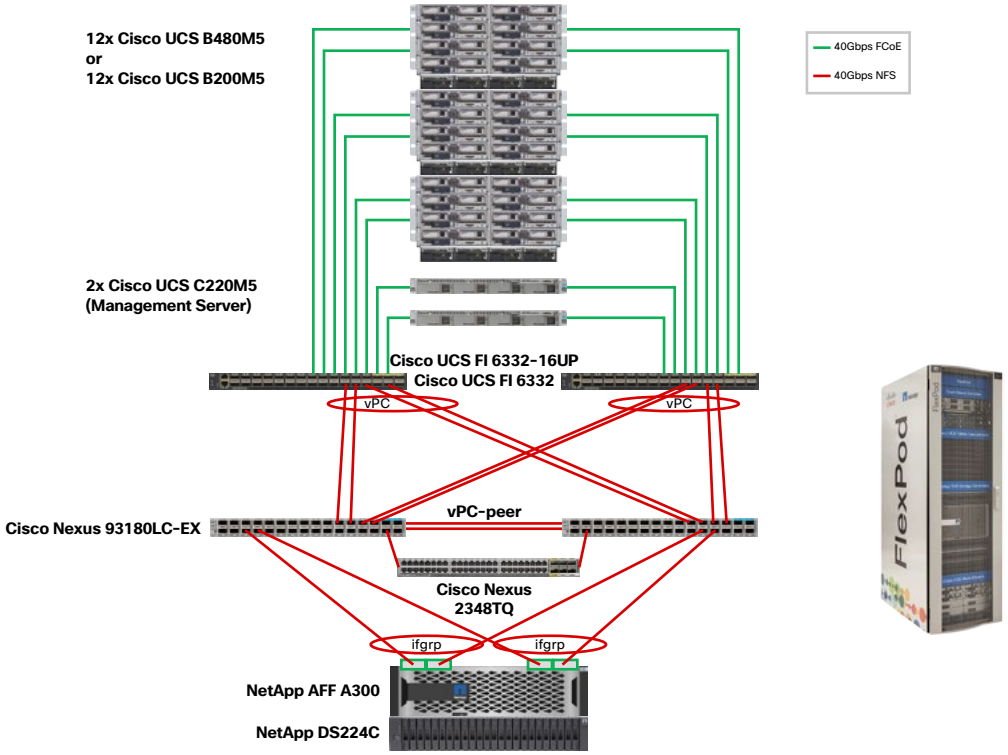
BUSINESS CHALLENGES

- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

- Converged infrastructure for the NextGen data center
- Investment protection in high density and high performance data center environments. Nexus switches used are leaf node supported; easing shift to ACI mode
- High performance, scalable and resilient systems

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_n9k_aff_ucsm.html

FlexPod with Microsoft Exchange 2013 on Cisco ACI

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct Fabric Inter connect attached C-series
- vSphere 5.5 virtualization platform
- Microsoft Exchange 2013

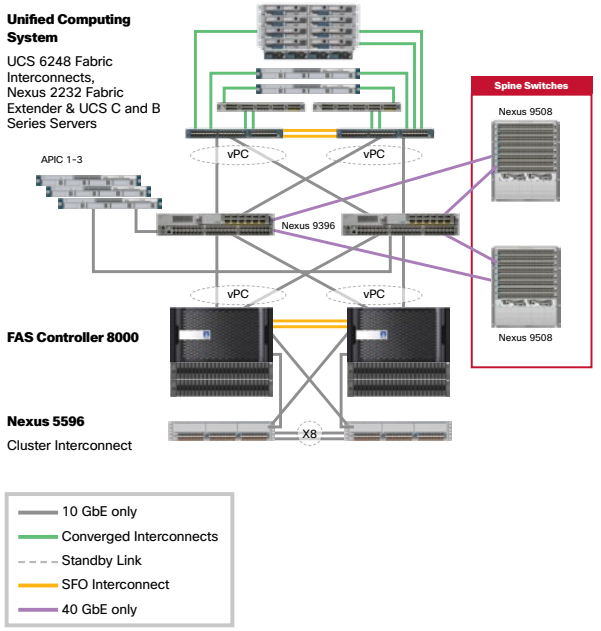
BUSINESS CHALLENGES

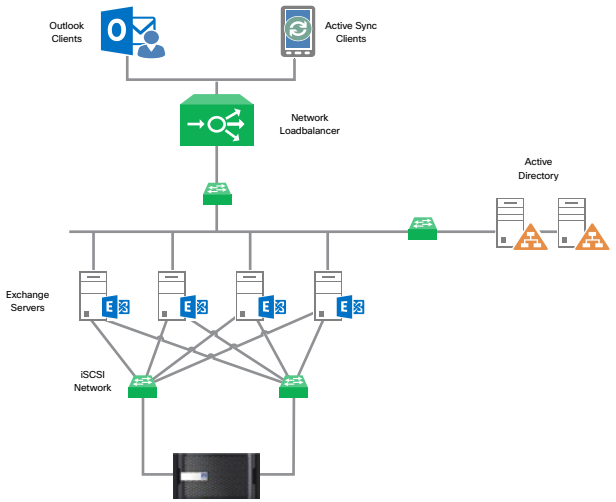
- Scalability and performance issues
- Challenges in business adjacency due to growing enterprises and complexity in managing them
- Time consuming, convoluted, expensive application deployment
- Isolated network regulation
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenant environment

SUMMARY

- Converged infrastructure based on Cisco unified data center
- Consistent network policies throughout the data center with enhanced automation capability
- Rapid Exchange application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE





CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/exchange2013_aci_flexpod_vmware.html
Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/exchange2013_aci_flexpod_vmware_design.html

Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct fabric interconnect attached C-series
- Direct attached storage for FCoE Boot support
- vSphere 5.1 virtualization platform
- Microsoft SharePoint 2013

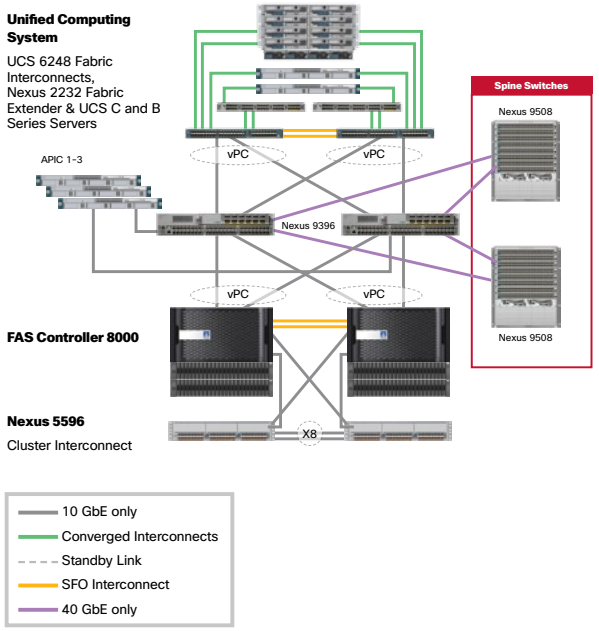
BUSINESS CHALLENGES

- Scalability and performance issues
- Challenges in business adjacency due to growing enterprises and complexity in managing them
- Time consuming, convoluted, expensive application deployment
- Isolated network regulation
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenant environment

SUMMARY

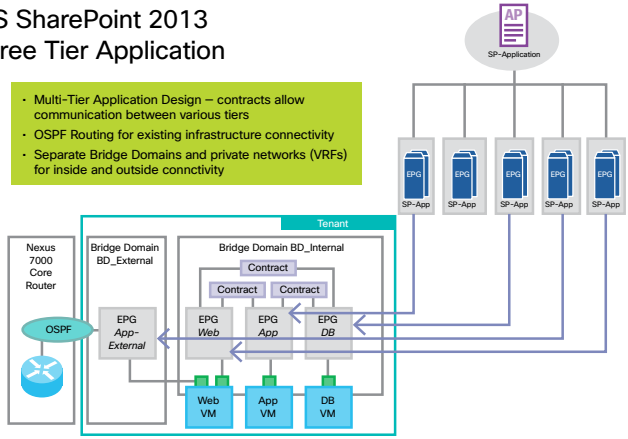
- Converged infrastructure based on Cisco unified data center
- Consistent network policies throughout the data center with enhanced automation capability
- Rapid SharePoint application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE



MS SharePoint 2013
Three Tier Application

- Multi-Tier Application Design – contracts allow communication between various tiers
- OSPF Routing for existing infrastructure connectivity
- Separate Bridge Domains and private networks (VRFs) for inside and outside connctivity



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/sharepoint2013_aci_flexpod_vmware_deploy.pdf
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FlexPod Datacenter for SAP HANA with Nexus 9000

TECHNICAL HIGHLIGHTS

- Scalable architecture with new Cisco Nexus 9000 series switches in standalone mode
- Implementation of mixed HANA use case scale-up with physical server and virtualization option, scale-out for physical server and suites on HANA
- Scalable unified storage for iSCSI and NFS traffic. NetApp FAS 8000 Series
- Supports mulitple OS Red Hat Enterprise Linux 6.5, SUSE Linux Enterprise Server 11 SP 3

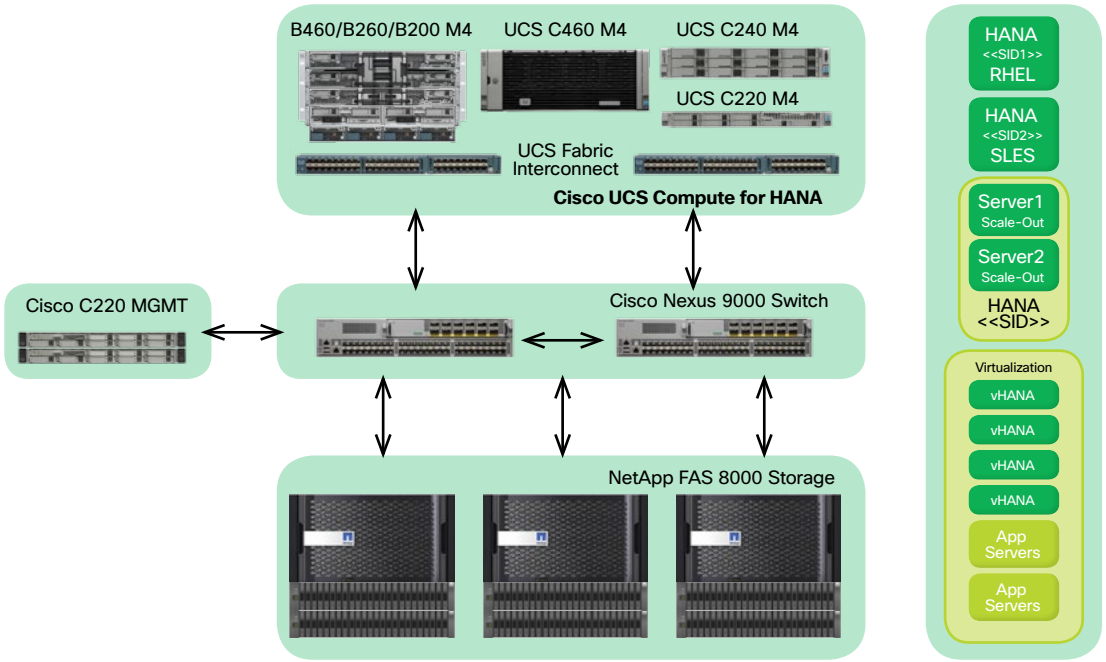
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for cloud solutions
- Provides architecture for SAP HANA solution efficiently virtualizing various compute option from Cisco UCS servers for varied customer use cases
- Provide a reliable, flexible and scalable reference design

SUMMARY

- Integration of compute, network and storage solution
- Rapid provisioning of SAP HANA using UCS service profile, storage clone using NetApp Flexclone
- Scalable NetApp storage using cluster Data ONTAP, using dedicated cluster switch
- Integration of vSphere 5.5 for virtualized HANA support
- Multiple HANA instances on shared infrastructure, with an option to include application server connecting to HANA DB

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_n9k.pdf

FlexPod with Oracle RAC

TECHNICAL HIGHLIGHTS

- UCS 2.1(1a) with physical server Oracle Linux running on FlexPod
- Boot-over-SAN capabilities with Oracle RAC 11gR2
- Performance validation of a 4node RAC with Direct NFS (dNFS)

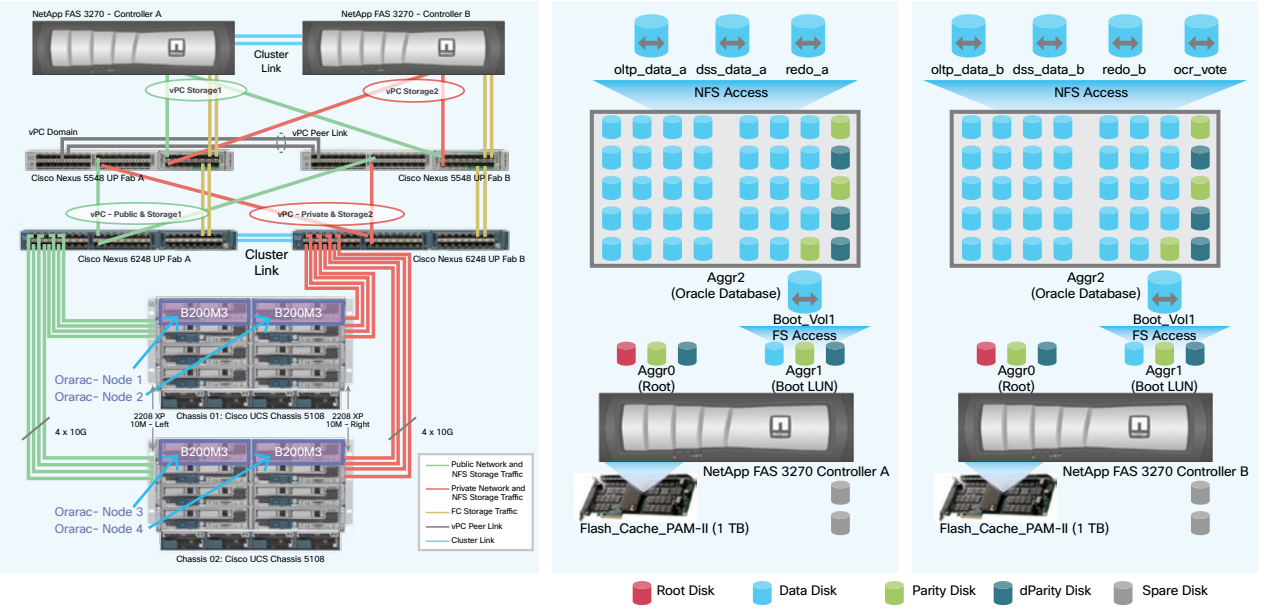
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Need a balanced configuration
- Require best practices for customers looking to run Oracle RAC on FlexPod
- Want improved availability and linear scalability

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable and resilient system

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcracbm.html

Oracle JD Edwards on FlexPod

TECHNICAL HIGHLIGHTS

- UCS 2.1(1a) with FlexPod (7-mode)
- Support for Oracle Linux 5.8 (RH kernel) with Oracle RAC 11.2.0.3
- Performance validation and benchmark of both JDE interactive and batch apps
- NetApp clustered Data ONTAP 8.1.2

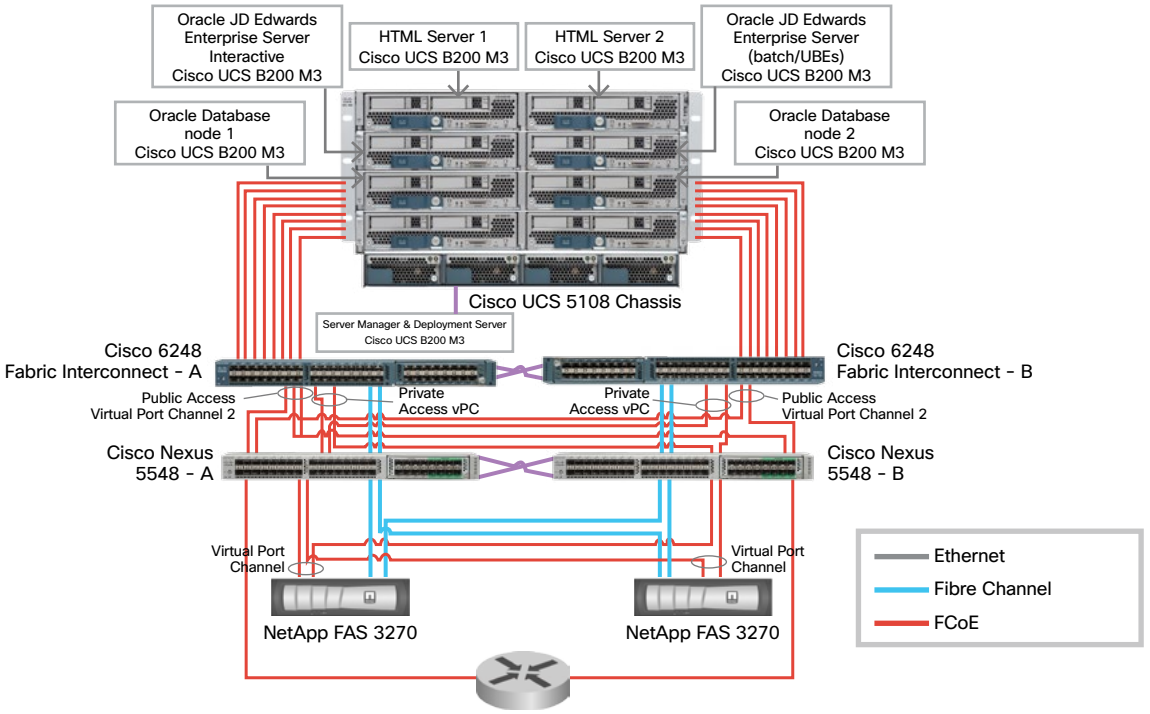
BUSINESS CHALLENGES

- Customers looking to lower TCO by migrating from older infrastructure primarily on AS/400
- Migrating customers opting for integrated compute & storage platform, and FlexPod with RedStack proves to be a clear alternative
- Customers looking for an end-to-end solution on Intel® Xeon™ based h/w and none of the h/w vendors have established a complete JDE solution on Oracle Linux with Oracle RAC

SUMMARY

- Integration compute and storage solution with FlexPod
- Joint publication with Cisco-Oracle-NetApp
- Best-in-class batch and interactive performance with lower TCO
- High-performance, scalable and resilient system

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Flexpod_orcjde_bm.html

Infrastructure | Converged

FLEXPOD

Other

- FlexPod Datacenter for Hybrid Cloud with Cisco CloudCenter and NetApp Private Storage ***- New***
- FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5 ***- New***
- FlexPod Datacenter with Oracle RAC on Oracle Linux
- FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0
- FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

FlexPod Datacenter for Hybrid Cloud with Cisco CloudCenter and NetApp Private Storage

TECHNICAL HIGHLIGHTS

- Cisco CloudCenter provides seamless application deployment in DC, AWS and Azure
- FlexPod DC with ACI-based private cloud to enable automated network provisioning
- NetApp Private Storage hosted in Equinix provides high-speed connectivity to multiple clouds including AWS and Azure

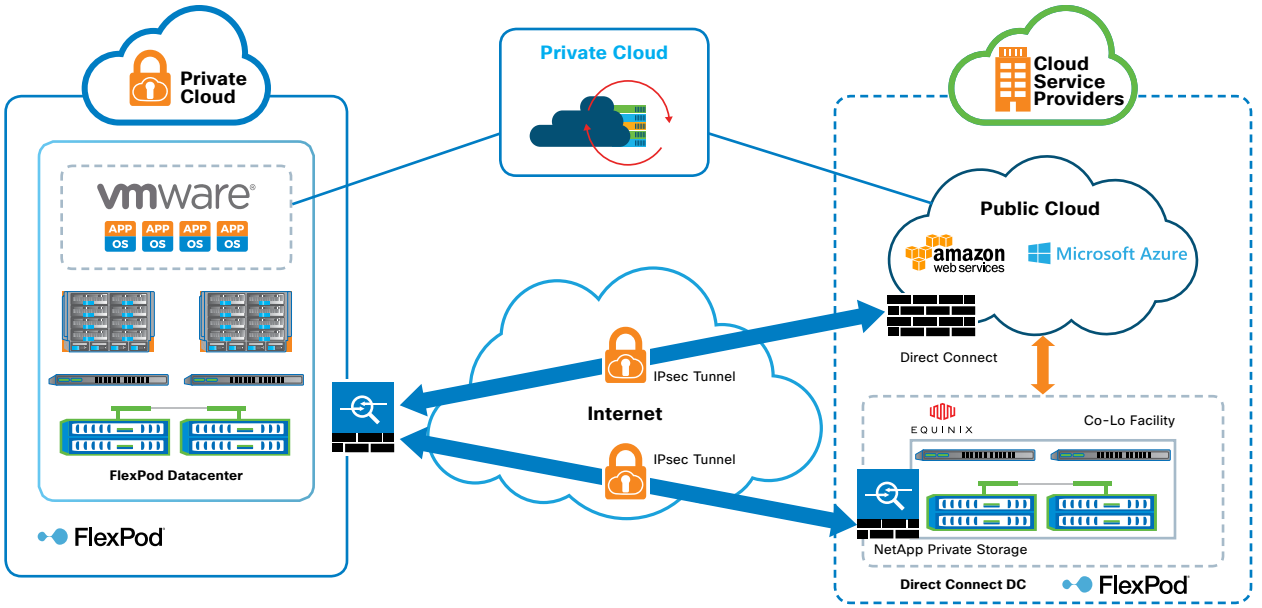
BUSINESS CHALLENGES

- Simplify applications deployment across multiple private and public clouds
- Maintain control of critical customer data and provide secure data transfers
- Enable distributed applications – application tiers running on different clouds

SUMMARY

- Secure, high-performance integration between FlexPod and leading cloud providers
- Multi-cloud App deployment with automated data provisioning
- Utilize the resources in public clouds while maintaining control of critical customer data
- Seamless data mobility between on premise NetApp storage and NPS using secure encrypted communication

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_hybridcloud.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_hybridcloud_design.html

FlexPod SolidFire with Cisco UCS, Nexus 9000-EX Cloud Scale Switches and vSphere 6.5

TECHNICAL HIGHLIGHTS

- Cisco UCS & 6248UP FI running 3.1(3a) and VMware vSphere 6.5d
- Cisco Nexus 93180YC-EX switches with the advanced traffic analysis and management capabilities of Cloud Scale ASICs, deployed in standalone mode to provide 10GbE connectivity and migration to ACI and 40GE as needed
- NetApp SF9608, an iSCSI-based, all-flash storage solution based on the Cisco UCS C220 M4S Server platform

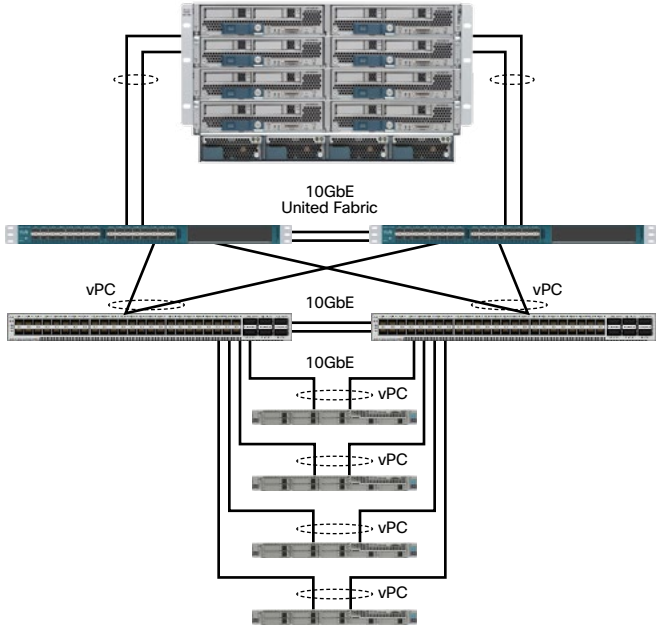
BUSINESS CHALLENGES

- Delivering a next generation data center platform with the agility to support rapidly evolving business needs
- Flexible storage with the scale, performance and automation required for next generation data center and workloads

SUMMARY

- Next generation data center infrastructure for enterprise and cloud deployments with Cisco UCS, Cloud Scale Nexus 9000-EX switches and NetApp SolidFire SF9608 node based, all flash scale-out storage
- Agile, programmable infrastructure for mixed workloads and next generation applications
- Advanced capabilities of Nexus 9000 switches with Cloud Scale ASICs with intelligent buffering, Advanced Traffic Management and Telemetry with no CPU Impact

ARCHITECTURE



UCS Blade Server Chassis, UCS 2200 Series Fabric Extenders and UCS B-Series Blade Servers

UCS 6248UP Fabric Interconnects

Nexus 93180YC-EX

NetApp SolidFire Nodes (SF9608 - Based on C220M4S Servers)

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpodsf_esxi65.html
Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpodsf_esxi65design.html

FlexPod Datacenter with Oracle RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- Cisco UCS 2.2(3a) and NetApp FAS 8080 with Oracle 12c RAC and Oracle Linux
- A single platform built from unified compute, fabric, and storage technologies, allowing you to scale to large-scale data centers without architectural changes
- NetApp FAS Hybrid Arrays with Flash Pool™ and Cisco UCS running OLTP and DSS databases together

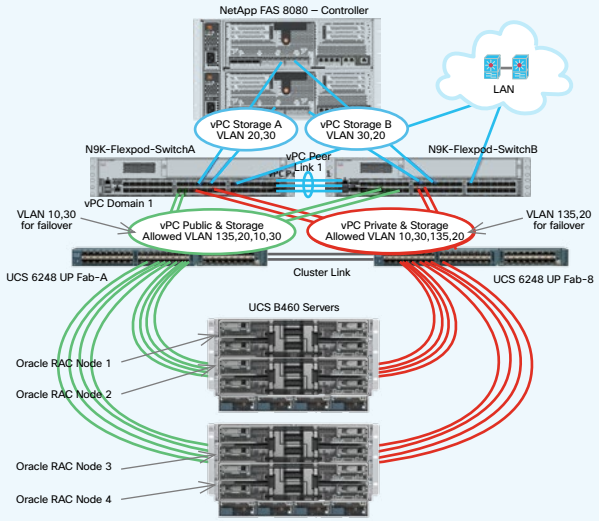
BUSINESS CHALLENGES

- Balancing large and continually evolving business requirement with a cost-efficient, high performing and always-available database infrastructure
- Pre-tested, scalable and best-in-class converged solution stack for optimizing your most challenging Oracle RAC database
- Oracle RAC must exude the highest level of flexibility, performance, scalability and resilience

SUMMARY

- Integrated compute, network & storage solution
- Centralized, simplified management of infrastructure resources, including end-to-end automation
- Hardware level redundancy for all major components using Cisco UCS and NetApp availability features

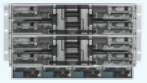
ARCHITECTURE



FlexPod Data Center Solution with UCS

Cisco Nexus Switch Family

Cisco Unified Computing System
UCS FI-6200
B-Series Blades



Cisco C-Series Rack Servers

NetApp FAS Storage Family

NetApp E-Series Storage Family

Configuration and Connectivity Best Practices

- Nexus 9000
- Nexus 7000
- Nexus 5600
- Nexus 5500
- Nexus 1110
- And more

- UCS 6200 FI
- Cisco UCS 5108
- UCS 2200 I/O Module
- UCS B-Series
- UCS C-Series
- And more

- FAS 8000
- AFF 8000
- FAS 2500
- DS2246
- DS4246
- E5500 Series
- And more

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcrac_12c_bm.html

FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0

TECHNICAL HIGHLIGHTS

- UCS 2.2(3g)
- B200 M4 blade servers
- NetApp E5500 and FAS 8040 storage controllers
- NetApp Clustered Data ONTAP 8.3
- Nexus 9000 Series switch
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux OpenStack Platform 6.0
- Red Hat Enterprise Linux OpenStack Installer

BUSINESS CHALLENGES

- Converged infrastructure platform for OpenStack
- Trusted and supported OpenStack Platform from industry leaders
- Scale up or out without disruption
- Slow, complex, risky, and expansive deployments and operations
- Inflexible infrastructure

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- Highly available OpenStack Platform on Red Hat optimized Juno distribution
- End-to-end hardware level redundancy using Cisco UCS and NetApp high availability features

ARCHITECTURE

Cisco Unified Computing System

- Cisco Nexus 5108 B-Series UCS Chassis
- Cisco 2204XP Fabric Extenders
- B200 M4 Server(s)
- Cisco UCS 6248UP Fabric Interconnect

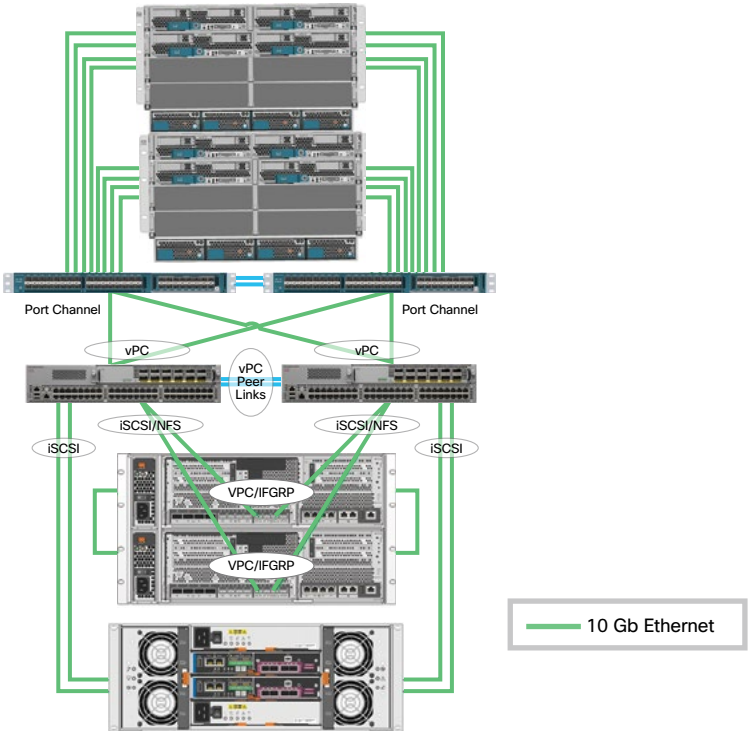
Cisco Nexus 9372PX

NetApp FAS Storage

- 1 NetApp FAS8040 Array
- 2 10GB NIC per Controller

NetApp E-Series Storage

- 1 NetApp DE5560 Array
- 2 NetApp E5500 4x 10Gb iSCSI Controller
- 2 10GB HIC per Controller



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_openstack_osp6.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_openstack_osp6_design.html

FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1

TECHNICAL HIGHLIGHTS

- Oracle Database 11g R2 RAC
- Oracle VM Release 3.1.1
- Multi-hop FCoE
- Boot from FCoE
- NetApp Data ONTAP 8.2

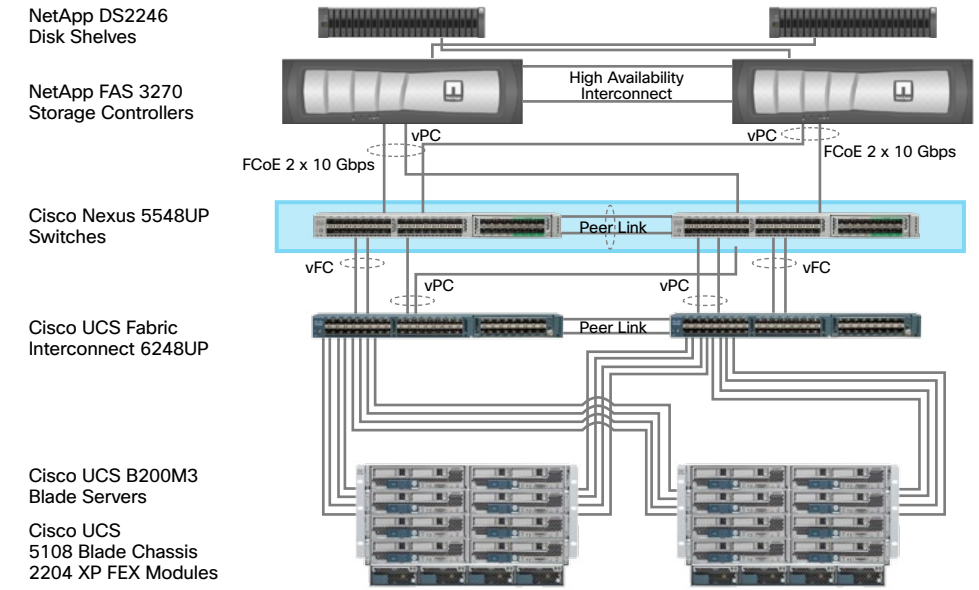
BUSINESS CHALLENGES

- Need high availability
- Require rapid provisioning
- Under utilized servers
- Database server consolidation
- Lower Oracle licensing costs

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- A flexible and cooperative support model that resolves issues rapidly and spans across new and legacy products
- Cisco UCS combined with a highly scalable NAS platform from NetApp provides the ideal combination for Oracle's unique, scalable, and highly available NFS technology

ARCHITECTURE



CVD: http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcracovm_fcoe.html

Infrastructure | Converged

VERSASTACK

- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage – ***New***
- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution – ***New***
- VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
- VersaStack Data Center with Cisco Application Centric Infrastructure
- VersaStack with Cisco Application Centric Infrastructure and IBM SAN Volume Controller
- VersaStack with Cisco UCS Mini and VMware vSphere 6.0 U2 with Direct Attached SAN Storage
- VersaStack with IBM Storwize v5000 and Cisco UCS Mini
- VersaStack for Data Center with All Flash Storage
- VersaStack for Data Center Scale-out
- VersaStack for Data Center with Cisco UCS Director
- VersaStack for Data Center with Direct Attached Storage
- VersaStack Integrated Infrastructure

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

TECHNICAL HIGHLIGHTS

- End-to-end 40G capable UCS Architecture delivers high-throughput performance with programmable QoS critical for scale-out storage solutions
- Unified scale-out framework - optimized to deliver compute, capacity and throughput intensive workloads
- True scale-out storage with self-healing capabilities combined with object services support

BUSINESS CHALLENGES

- Enterprises today struggle to manage the explosive growth of data while remaining agile and cost competitive
- 70% of IT decision makers believe that their current storage systems will not be able to handle next generation workloads
- Inadequate storage infrastructure is considered to be a significant pain point

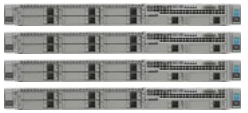
SUMMARY

- IBM COS provides the industry leading solution to manage unstructured data in a scalable, reliable, secure, and cost-effective environment
- Cisco and IBM are collaborating to offer customers a scalable object storage solution for unstructured data that integrates with IBM Cloud Object Storage
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center

ARCHITECTURE

- 2 x 6332 Fabric Interconnects
- Full Deployment UCS Managed
- 40 GbE end-to-end
- Up to 3.3 PB Raw Capacity in 6 S3260 - 24RU

- 1 x C220 M4 Server
- 1 x IBM COS Manager



- 4 x C220 M4 Servers
- 4 x IBM COS Accessers

- 6 x S3260 Storage Servers
- 12 x M4 Server Nodes
- 12 x IBM COS Slicestors

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Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_versastack_ibmcos_design.html

VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution

TECHNICAL HIGHLIGHTS

- VersaStack with Cisco ACI and SVC for private cloud and IBM Bluemix public cloud
- Cisco ONE Enterprise Cloud Suite, which includes CloudCenter to automate self-service application deployment to users' choice of on-premises or public cloud environments
- IBM Spectrum Copy Data Management that orchestrates the creation, distribution, efficient use, and retention of application-aware copies of data, both on-premises and in the cloud

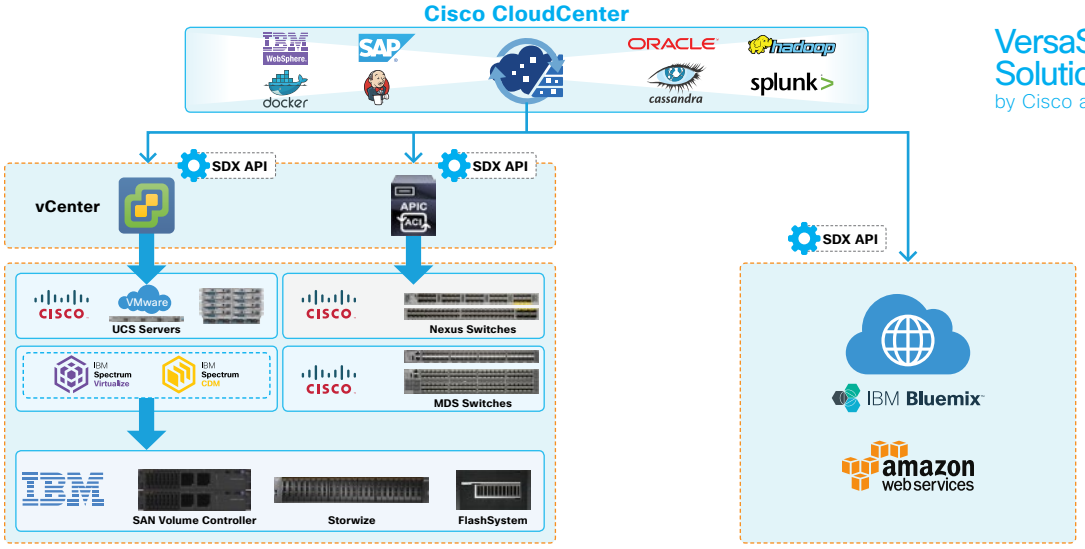
BUSINESS CHALLENGES

- **Operational complexity:** Ability to deploy and run applications on-premises or off-premises without modification
- **Inconsistency:** The different formats and opaque private and public cloud environments can induce inconsistencies, and lack of consistent policies which can further erode transparency
- **Visibility and management:** Having same degree of visibility and management as the workloads migrate from one environment to another

SUMMARY

- "Converged cloud" IT infrastructure that allows easy movement of applications across on-premises and cloud environments
- End-to-end copy data management to lower storage capacity requirements and accelerate application development and testing
- IT as a service to balance user self-service on-demand deployment and management in environments with central governance and control
- Capacity utilization optimization with automated standup and teardown of applications

ARCHITECTURE



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Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_hc_ciscocloudcenter_cdm.html

VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M4 chassis
- 5,000 mixed RDSH and VCC users combined and infrastructure servers in four 5108 blade server chassis
- 5000 combined RDS-hosted server sessions and VCC users, Cisco hardware, FIs, Nexus switches, IBM A9000 FlashSystem Storage in 42 RU single rack solution
- Performance study with simulations of RDS-hosted server sessions and VCC typical desktop workloads running knowledge worker workload

BUSINESS CHALLENGES

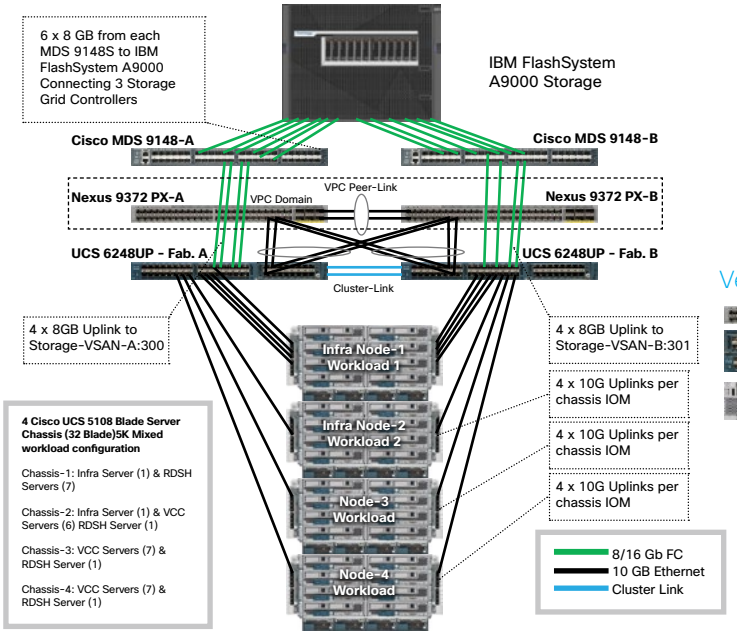
- Typical VMware Horizon tops and RDS-hosted server sessions mixed workload combined users
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing RDSH and VCC solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Very good end-user experience measuring <1 second for both RDSH and VCC users on cluster level and 5000 users mixed workload level
- IBM modular storage technology. Storage controller failure with 3 active grid controllers technology. No business disruption resilient capability

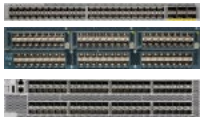
ARCHITECTURE

Physical Architecture



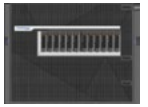
VersaStack – A single rack solution for 5000 (RDSH & VCC) Mixed Users

VersaStack Components



Fabric
2 Cisco Nexus 9372PX Switches
2 Cisco UCS 6248UP Fabric Interconnects
2 Cisco MDS 9148S 16Gb Fibre Channel / Switches

Compute
1 Cisco UCS 5108 Blade Chassis
2 Cisco UCS 2208 IO Modules
Up to 8 Cisco UCS B200 M4 Blade Servers



Storage:
1 IBM FlashSystem A9000
12 x1.2 TB MicroLatency Modules (21.44 TB Raw capacity)

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_horizon7_flasha9k_5k.html

VersaStack Data Center with Cisco Application Centric Infrastructure

TECHNICAL HIGHLIGHTS

- Nexus 9000 based ACI Infrastructure
- Policy driven network configuration
- IBM Storwize V7000 Unified and FlashSystem V9000 designs
- Fibre channel, NFS and iSCSI-based storage connectivity
- Cisco AVS and VMware VDS-based virtual switching architecture

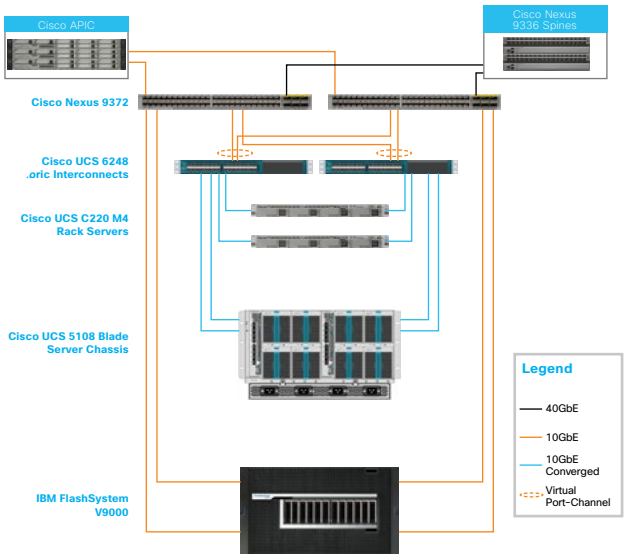
BUSINESS CHALLENGES

- Slow, complex, expensive application deployment
- Isolated network control
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenancy support

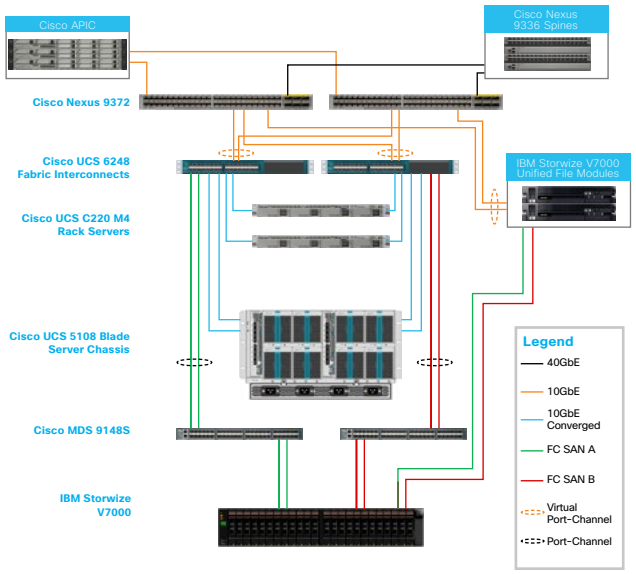
SUMMARY

- Integration of latest Cisco ACI-based network functionality into the VersaStack architecture
- Highlight latest UCS hardware and software features
- Consistent network policies throughout the DC with enhanced automation capabilities
- Rapid application deployment

ARCHITECTURE



iSCSI based storage design with IBM FlashSystem V9000



FC and NFS based storage design with IBM Storwize V7000 Unified

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_aci_vmw6.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_aci_vmw6_design.html

VersaStack with Cisco Application Centric Infrastructure and IBM SAN Volume Controller

TECHNICAL HIGHLIGHTS

- Nexus 9000 based ACI infrastructure
- IBM SAN Volume Controller (SVC) based single point of storage control for FC and iSCSI based storage access
- IBM FS900 and v5030 based multi-tiered storage
- UCS C-series based dedicated management cluster

BUSINESS CHALLENGES

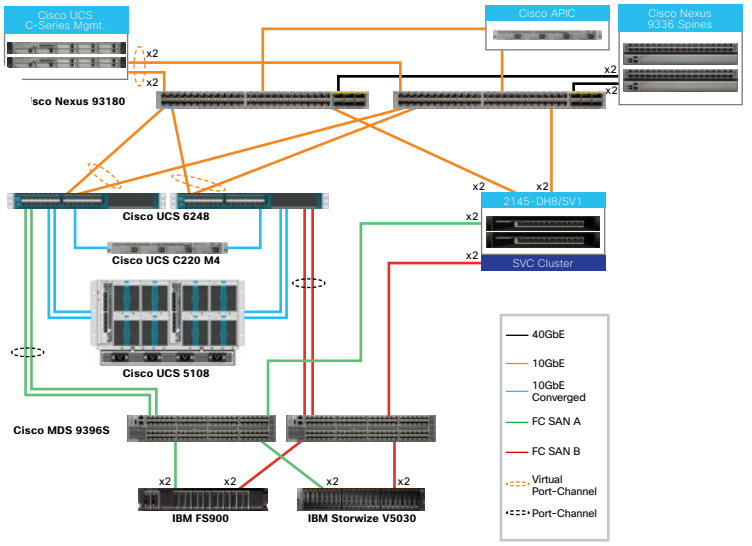
- Slow, complex, expensive application deployment
- Inefficient orchestration and cumbersome network automation
- Inconsistent storage functions and lack of standardized storage support
- Complex multi-tiered storage support

SUMMARY

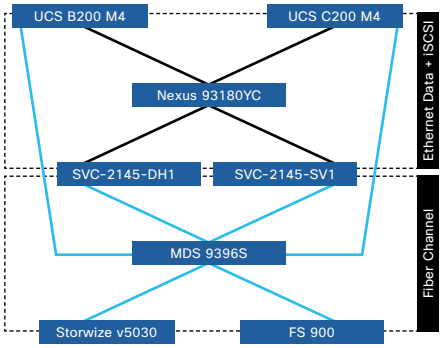
- Integration of IBM SVC to support a tiered storage design based on IBM Storwize and FlashSystem
- Highlight latest network and compute features and functionality by utilizing ACI version 2.x and UCS 3.1.2
- Consistent network policies throughout the data center with enhanced automation capabilities
- Rapid application deployment

ARCHITECTURE

Physical Layout



Logical Design



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_aci_svc_vmw6.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_aci_svc_vmw6_design.html

VersaStack with Cisco UCS Mini and VMware vSphere 6.0 U2 with Direct Attached SAN Storage

TECHNICAL HIGHLIGHTS

- Cisco Unified Computing System (Cisco UCS) Mini with embedded management, networking and storage access
- New integrated fabric interconnect (Cisco UCS 6324) with support for 2nd UCS chassis
- IBM Storwize V5000 Gen2 system – directly connected to Cisco UCS Mini using fibre channel
- VMware vSphere 6.0 U2, Cisco UCS 3.1(2c), IBM Spectrum Virtualize V7.7.1

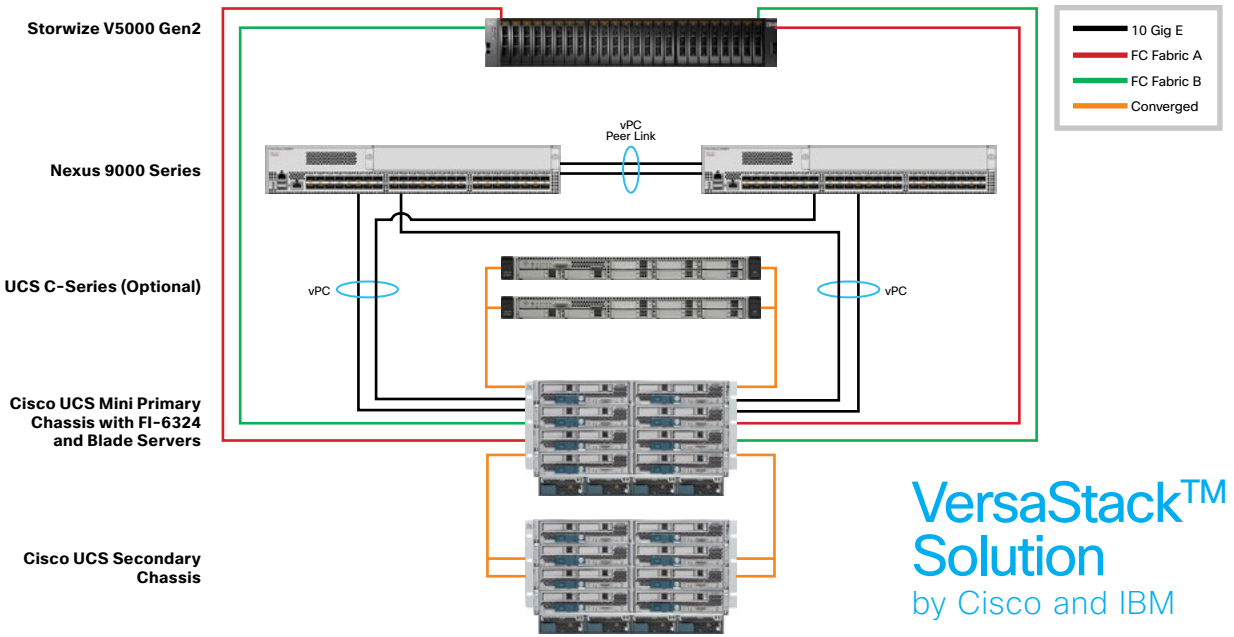
BUSINESS CHALLENGES

- **Reducing cost:** to reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- **Supporting business requirements:** to create a more flexible and agile infrastructure
- **Reducing time-to-market:** to enable rapid deployment of new services quickly

SUMMARY

- **Easy:** Simple and flexible infrastructure platform – ideal for SMB or small deployments
- **Efficient:** Reduce provisioning time with unified management and seamless integration through the validated deployment
- **Versatile:** Dynamic, scalable infrastructure with Cloud compatibilities

ARCHITECTURE



VersaStack™ Solution
by Cisco and IBM

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_n5k_2ndgen_mini.html

VersaStack with IBM Storwize v5000 and Cisco UCS Mini

TECHNICAL HIGHLIGHTS

- Cisco Unified Computing System (Cisco UCS) Mini
- New integrated Fabric Interconnect and 110V power supplies
- Management, networking and storage control embedded in the chassis
- IBM Storwize V5000 system

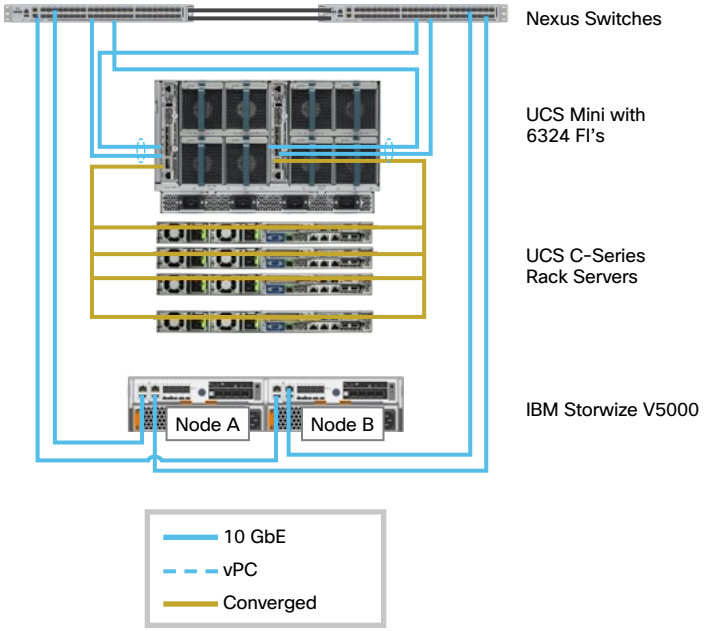
BUSINESS CHALLENGES

- **Reducing cost:** to reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- **Supporting business requirements:** to create a more flexible and agile infrastructure
- **Reducing time-to-market:** to enable rapid deployment of new services quickly

SUMMARY

- Consistent management with appropriate scale from the edge of the network to the data center
- VersaStack Infrastructure for use cases including Remote Office/Branch Office, Small Medium Business, VCC
- VersaStack for Enterprises and Service Providers with streamlined architecture

ARCHITECTURE



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Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n5k_mini_design.html

VersaStack for Data Center with All Flash Storage

TECHNICAL HIGHLIGHTS

- UCS M4 blade support
- Detailed instructions deploying VersaStack in Fibre Channel environment leveraging IBM FlashSystem V9000. Implementation leverages Cisco 9k network and MDS fabric switches
- Nexus 9000 ACI ready

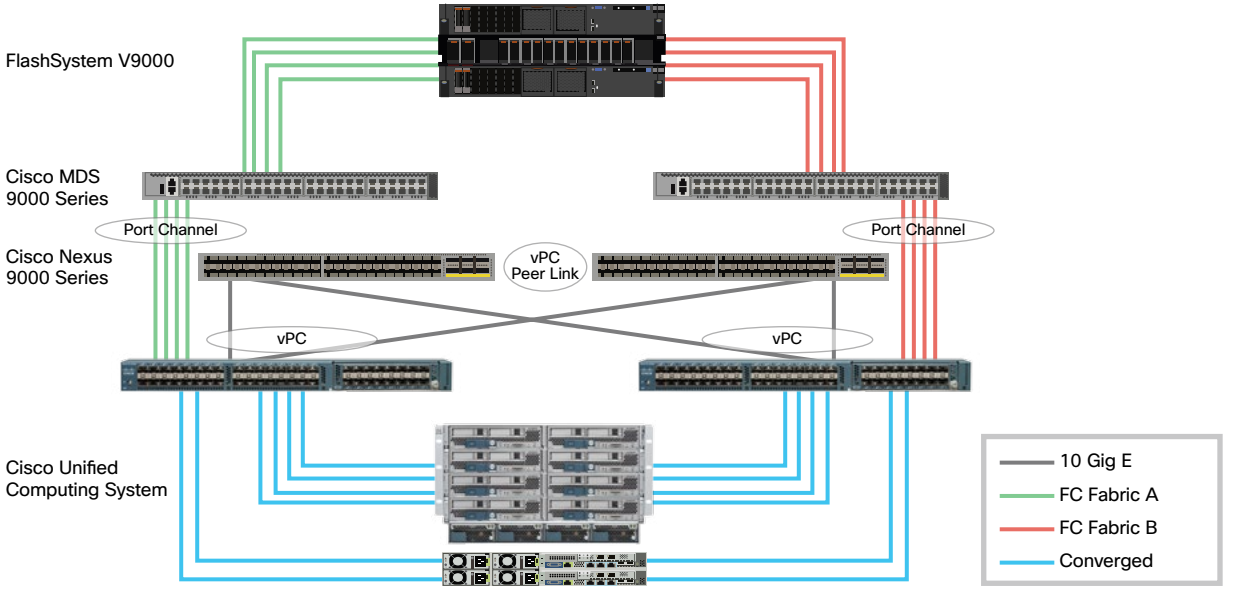
BUSINESS CHALLENGES

- Operational complexity and increasing cost of people, management, software, and facilities
- Increased demand for new services (e.g. mobility, social media, collaboration, the Internet of Everything (IoE), in-memory database technologies)
- Shift toward heavily virtualized private, hybrid, and public cloud computing

SUMMARY

- Easy – Seamless integration through the validated deployment
- Efficient – Reduce provisioning time with Unified Management
- Versatile – dynamic, scalable infrastructure with cloud capabilities

ARCHITECTURE



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Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_vmw55_v9kflashdesign.html

VersaStack for Data Center Scale-out

TECHNICAL HIGHLIGHTS

- IBM v7000 Storwize 7.4 with 4 nodes scaling IO for Cisco UCS
- Mirroring with automatic failover- VersaStack can provide no downtime during a failure
- Storwize adds built-in encryption and 16 gig FC connectivity new for 7.4
- Easy Tier and In-line hardware compression
- Cisco Nexus 9000 ACI ready
- UCS M4 support along with MDS 16 gig

BUSINESS CHALLENGES

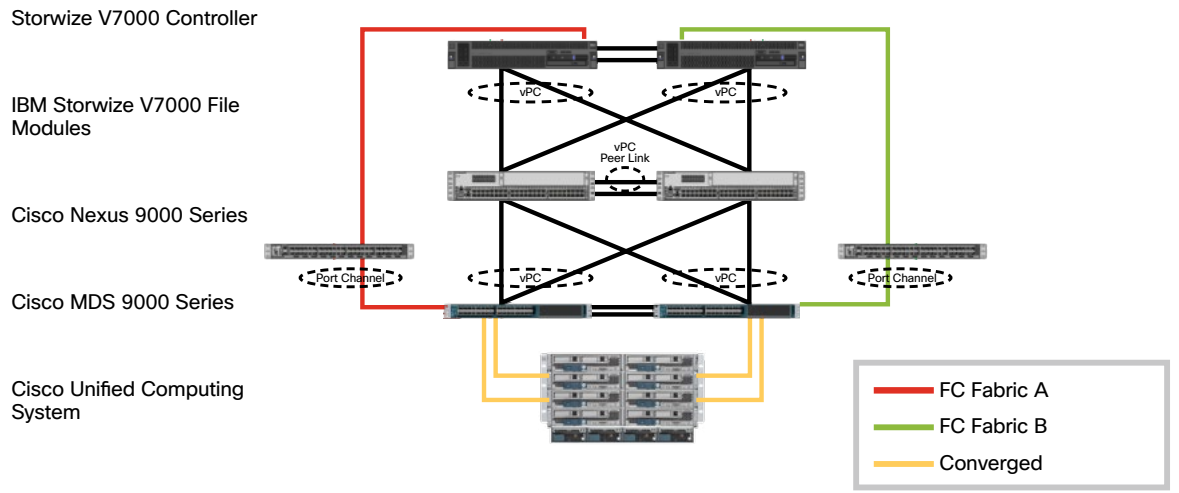
- Operational complexity and increasing cost of people, management, software, and facilities
- Increased demand for new services (e.g. mobility, social media, collaboration, the Internet of Everything (IoE), in-memory database technologies)
- Shift toward heavily virtualized private, hybrid, and public cloud computing

SUMMARY

- Easy – Seamless integration through the validated deployment
- Efficient – Reduce provisioning time with Unified Management
- Versatile – Dynamic, scalable simple infrastructure with cloud capabilities

ARCHITECTURE

VersaStack™ Solution
by Cisco and IBM



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n9k_vmw55_scale.html

VersaStack for Data Center with Cisco UCS Director

TECHNICAL HIGHLIGHTS

- Supports Cisco and non-Cisco devices and technologies in an agnostic manner
- IaaS cloud functionality for virtual and physical server resources with guided setup
- Scalable and shared architecture with resiliency and standard API's

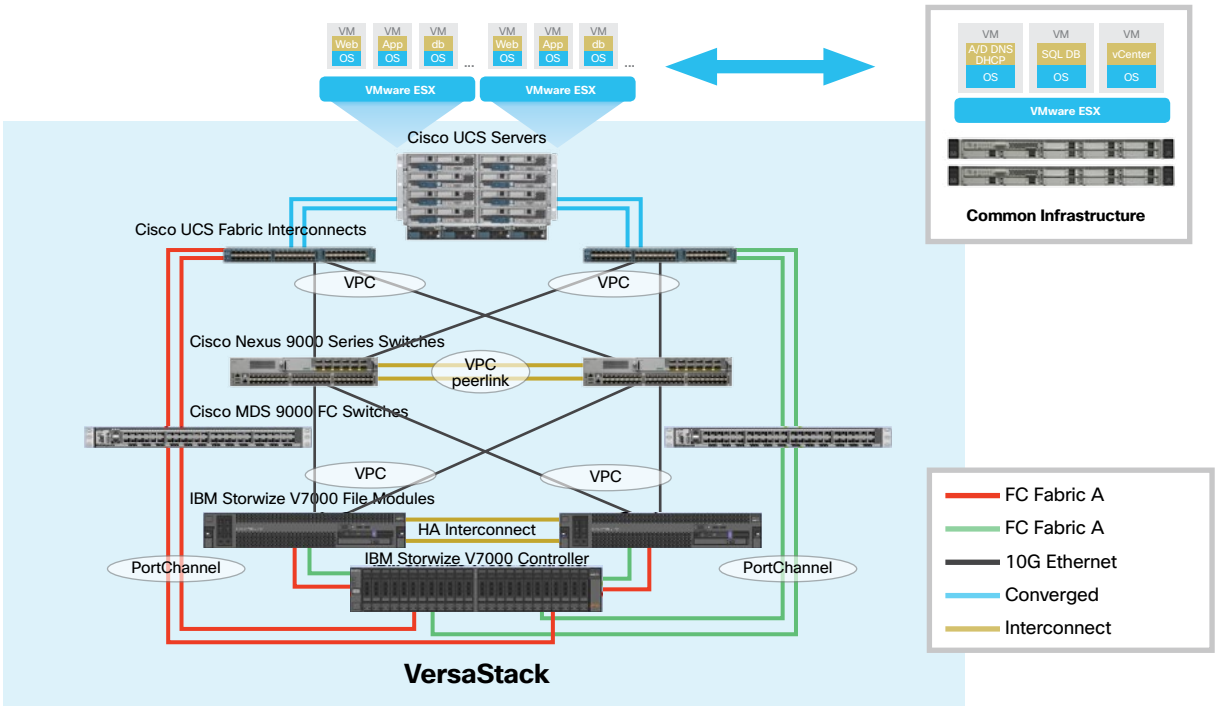
BUSINESS CHALLENGES

- Multiple element managers on integrated stacks
- Efficient and accountable IT resource use – service provider/ cloud model
- API's to integrate with enterprise tools for IT service management (ITSM)

SUMMARY

- Simple, efficient and scalable solution for any converged/integrated stack
- IaaS cloud delivery with features of orchestration, chargeback and self-service
- CVD eliminates risk and leverages Cisco UCS and IBM Storwize efficiencies for an optimal platform

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n9k_vmw55_ucsd.html

VersaStack for Data Center with Direct Attached Storage

TECHNICAL HIGHLIGHTS

- IBM v7000 Storwize storage directly attached to the Cisco UCS fabric interconnects
- Simplified and centralized management via UCSM SAN and LAN policies
- Nexus 9000 ACI ready
- UCS M4 support

BUSINESS CHALLENGES

- Operational complexity and increasing cost of people, management, software, and facilities
- Increased demand for new services (e.g. mobility, social media, collaboration, the Internet of Everything (IoE), in-memory database technologies)
- Shift toward heavily virtualized private, hybrid, and public cloud computing

SUMMARY

- Easy – Seamless integration through the validated deployment
- Efficient – Reduce provisioning time with unified management
- Versatile – Dynamic, scalable infrastructure with cloud capabilities

ARCHITECTURE

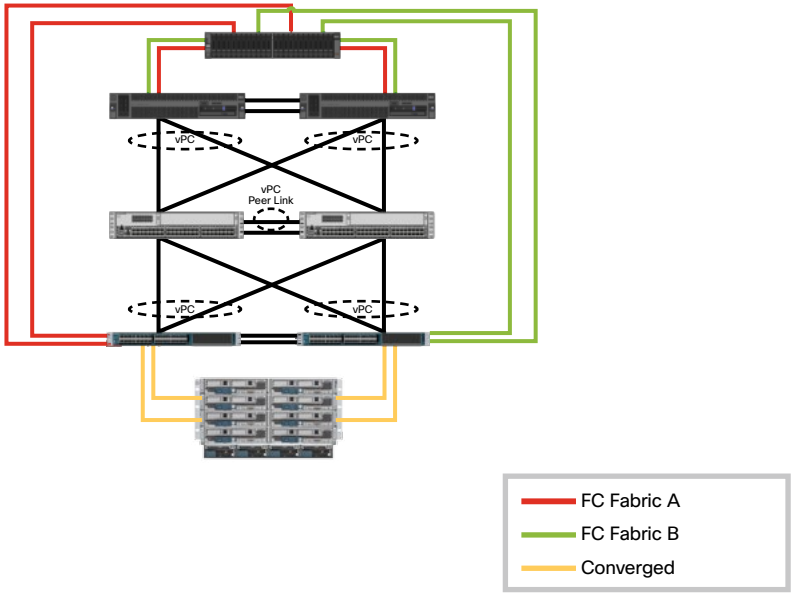
Storwize V7000 Controller

IBM Storwize V7000 File Modules

Cisco UCS 6248UP Fabric Interconnects

UCS5108 B-Series Blade Chassis

B200 M3 and M4 B-Series Blade(s)



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n9k_vmw55_directattach.pdf

VersaStack Integrated Infrastructure

TECHNICAL HIGHLIGHTS

- UCS M4 blade support
- Detailed instructions deploying VersaStack in either a NFS,FC unified environment leveraging IBM file modules, or a simplified architecture via a fibre channel only implementation. Both models leverage Cisco 9k network and MDS fabric switches
- Nexus 9000 ACI ready

BUSINESS CHALLENGES

- Operational complexity and increasing cost of people, management, software, and facilities
- Increased demand for new services (e.g. mobility, social media, collaboration, the Internet of Everything (IoE), in-memory database technologies)
- Shift toward heavily virtualized private, hybrid, and public cloud computing

SUMMARY

- Easy – Seamless integration through the validated deployment
- Efficient – Reduce provisioning time with Unified Management
- Versatile – Dynamic, scalable infrastructure with cloud capabilities

ARCHITECTURE

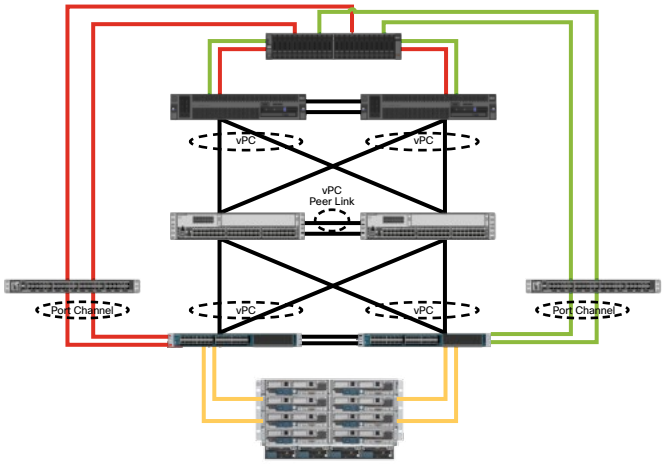
Storwize V7000 Controller

IBM Storwize V7000 File Modules

Cisco Nexus 9000 Series

Cisco MDS 9000 Series

Cisco Unified Computing System



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_n9k_vmw55.pdf
Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Versastack_design.pdf

Infrastructure | Converged

OPENSTACK

- Cisco UCS Integrated Infrastructure with Red Hat OpenStack Platform 8 and Red Hat Ceph Storage – ***New***
- Cisco UCS Integrated Infrastructure with Red Hat Enterprise Linux OpenStack Platform and Red Hat Ceph Storage 7.0
- FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

Cisco UCS Integrated Infrastructure with Red Hat OpenStack Platform 8 and Red Hat Ceph Storage

TECHNICAL HIGHLIGHTS

- UCS managed servers for stateless computing and wire- once architecture
- Scalable and highly available architecture with UCS blades and rack servers for storage
- Integration of Red Hat OpenStack – Liberty and Cisco plugins and an end-to-end validated solution

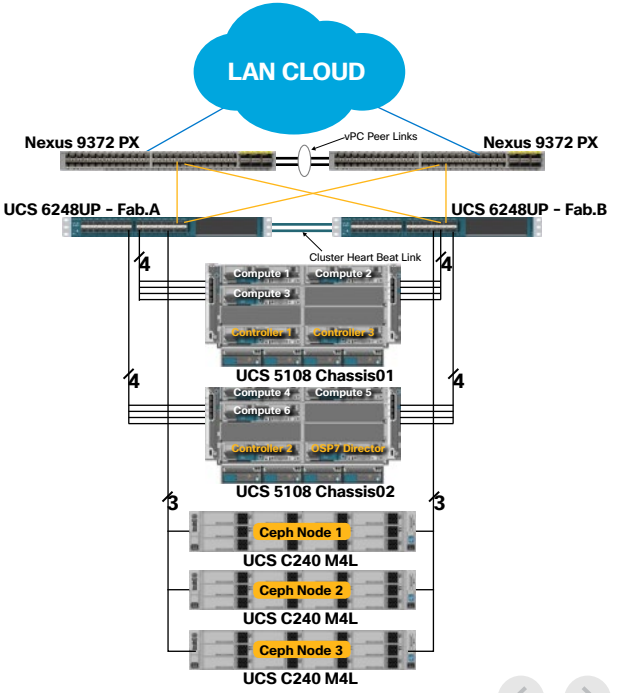
SUMMARY

- High performance, scalable and resilient solution
- Complete automation of OpenStack deployment with Cisco plugins
- Enterprise-level support from Cisco and Red Hat
- Turn key deployment of cloud platform targeting cloud-native apps
- Jointly engineered with Cisco, Red Hat and Intel

BUSINESS CHALLENGES

- Reduce shadow IT and emulate cost savings of public cloud
- Provide infrastructure for cloud applications
- Provide platform for transformation of business critical applications
- Simplify Devops
- Translated IT to internal service provider

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_openstack_osp8.html

Cisco UCS Integrated Infrastructure with Red Hat Enterprise Linux OpenStack Platform and Red Hat Ceph Storage 7.0

TECHNICAL HIGHLIGHTS

- UCS managed servers for stateless computing and wire-once architecture
- Scalable and highly available architecture with UCS blades and RACK servers for storage
- Integration of Red Hat OpenStack-Kilo and Cisco Plugins and an end-to-end validated solution

SUMMARY

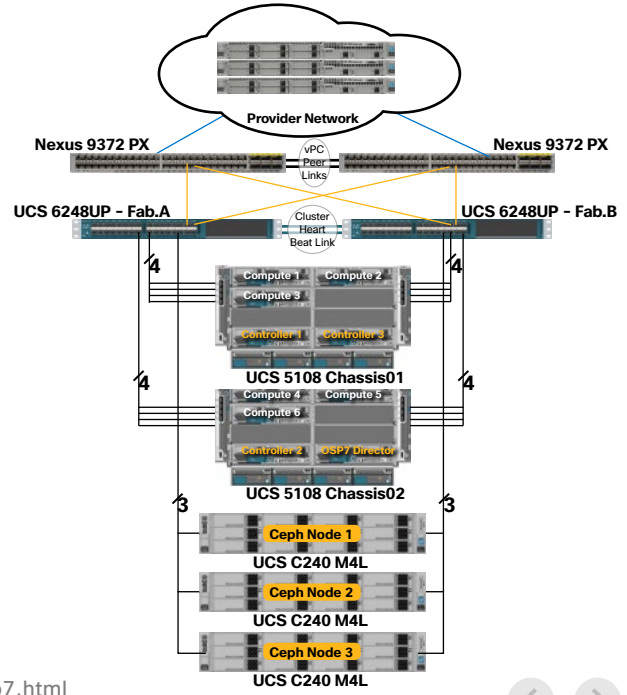
- High performance, scalable and resilient solution
- Complete automation of OpenStack deployment with Cisco plugins
- Enterprise level support from Cisco and Red Hat
- Turn key deployment of cloud platform targeting cloud-native apps
- Jointly engineered with Cisco, RedHat, and Intel

BUSINESS CHALLENGES

- Reduce shadow IT and emulate cost savings of public cloud
- Provide infrastructure for cloud applications
- Provide platform for transformation of business critical applications
- Simplify Devops
- Translated IT to internal service provider

ARCHITECTURE

Cisco UCS, OSP, CEPH Kilo



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Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/openstack_osp7_design.html

FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0

TECHNICAL HIGHLIGHTS

- UCS 2.2(3g)
- B200 M4 blade servers
- NetApp E5500 and FAS 8040 storage controllers
- NetApp Clustered Data ONTAP 8.3
- Nexus 9000 Series switch
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux OpenStack Platform 6.0
- Red Hat Enterprise Linux OpenStack Installer

BUSINESS CHALLENGES

- Converged infrastructure platform for OpenStack
- Trusted and supported OpenStack Platform from industry leaders
- Scale up or out without disruption
- Slow, complex, risky, and expansive deployments and operations
- Inflexible infrastructure

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- Highly available OpenStack Platform on Red Hat optimized Juno distribution
- End-to-end hardware level redundancy using Cisco UCS and NetApp high availability features

ARCHITECTURE

Cisco Unified Computing System

- Cisco Nexus 5108 B-Series UCS Chassis
- Cisco 2204XP Fabric Extenders
- B200 M4 Server(s)
- Cisco UCS 6248UP Fabric Interconnect

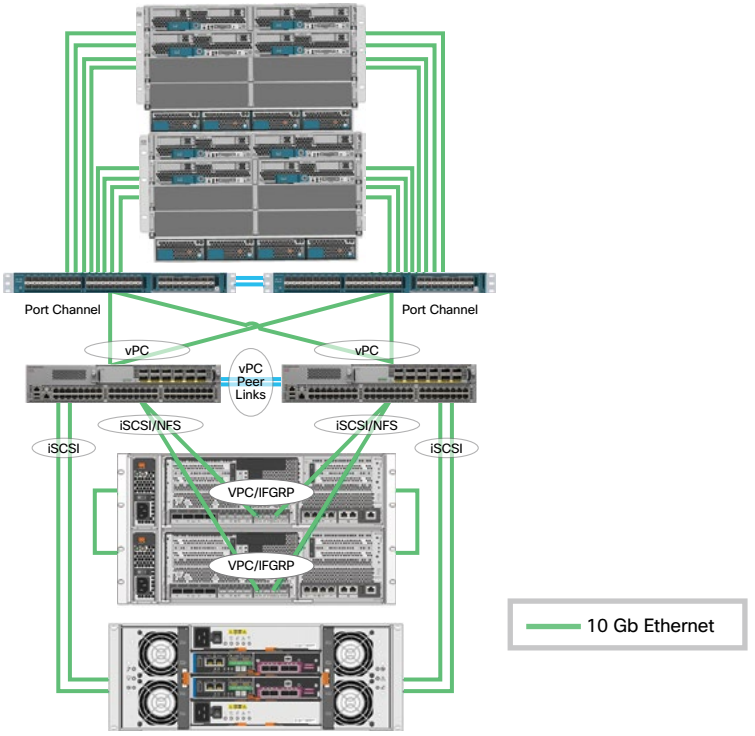
Cisco Nexus 9372PX

NetApp FAS Storage

- 1 NetApp FAS8040 Array
- 2 10GB NIC per Controller

NetApp E-Series Storage

- 1 NetApp DE5560 Array
- 2 NetApp E5500 4x 10Gb iSCSI Controller
- 2 10GB HIC per Controller



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_openstack_osp6.html
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Infrastructure | Converged

FLASHSTACK

- 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 – ***New***
- FlashStack Data Center with Oracle RAC 12cR2 Database – ***New***
- FlashStack for SAP HANA TDI
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack VSI with Commvault for Data Protection
- 5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
- FlashStack Data Center with Oracle RAC on Oracle Linux
- FlashStack Virtual Server Infrastructure

Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15

TECHNICAL HIGHLIGHTS

- Simple architecture with UCS B Series Servers
- High performance SAN for desktop workloads
- 1250 users per FlashStack Mini solution
- Performance study with simulations of typical desktop workloads

BUSINESS CHALLENGES

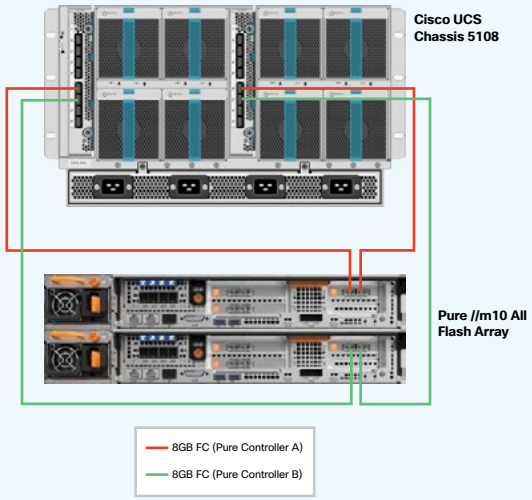
- Typical end-user virtualization workloads
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing VCC solutions

SUMMARY

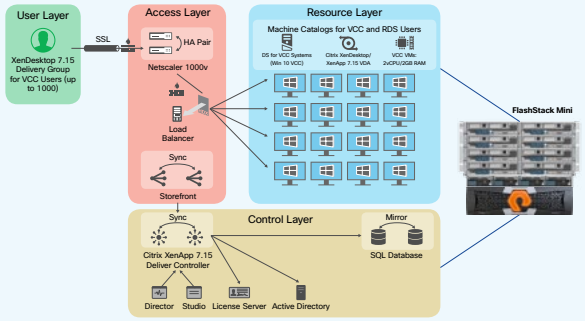
- High performance and scalability with simplicity
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Small footprint for SMB

ARCHITECTURE

Physical Architecture



Logical Architecture



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_citrixmshyperv_1250.html

FlashStack Data Center with Oracle RAC 12cR2 Database

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC, validated performance of server, network and NVMe all-flash storage on a per workload basis
- Seamless Oracle performance and scalability with data reduction to meet growth needs
- Maintain highly available database instances through software and hardware upgrades without compromising performance

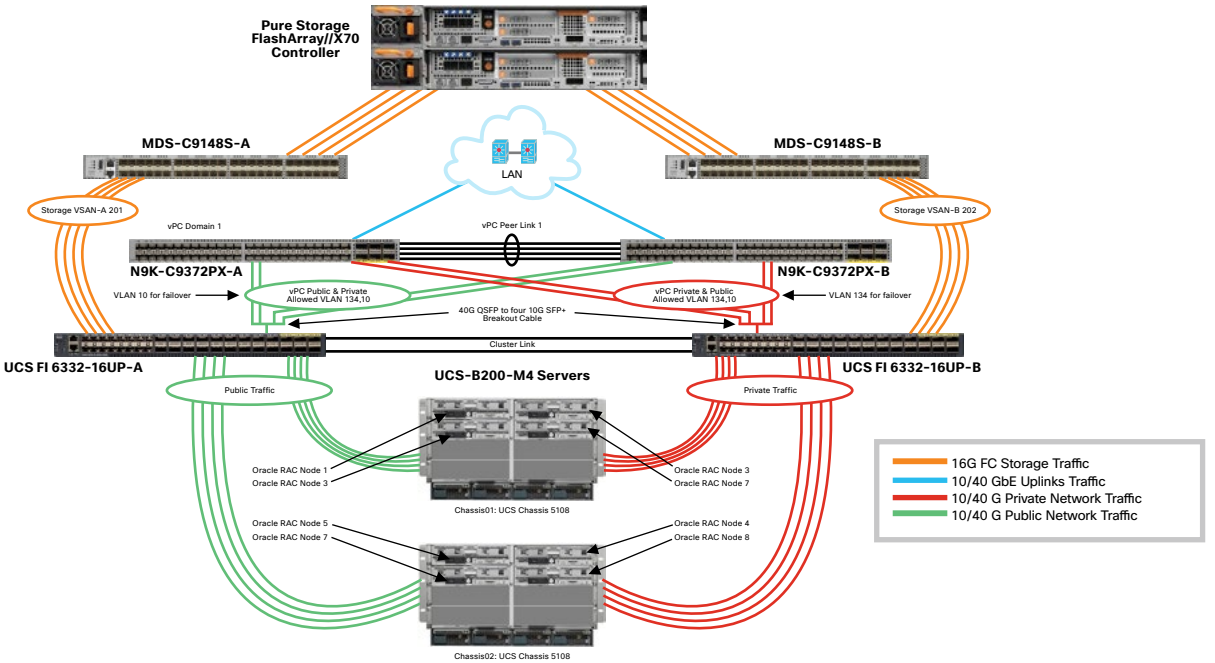
BUSINESS CHALLENGES

- New design targets a variety of scale-out application demands for database consolidation, management, and seamless date integration
- A cost-efficient, high performing and always-available infrastructure that balances enormous and evolving business requirements
- Pre-tested converged infrastructure that optimizes your mission critical Oracle performance and scalability requirements

SUMMARY

- A pre-validated integrated system managed, serviced, and tested as a complete offering
- Minimizes business disruption and improves IT agility while reducing deployment time
- Improved customer success back by Cisco Systems and Pure Storage

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC12cr2.html

FlashStack for SAP HANA TDI

TECHNICAL HIGHLIGHTS

- Seamless scalability of performance and capacity meeting required KPIs for SAP HANA TDI deployments; also ensuring high availability without performance compromise through in-place software and hardware upgrades
- Details the reference architecture for SAP HANA TDI implementation leveraging existing Cisco UCS infrastructure and Pure Storage
- Sample SAP HANA scale-up and 3+1 scale-out system deployment best practices

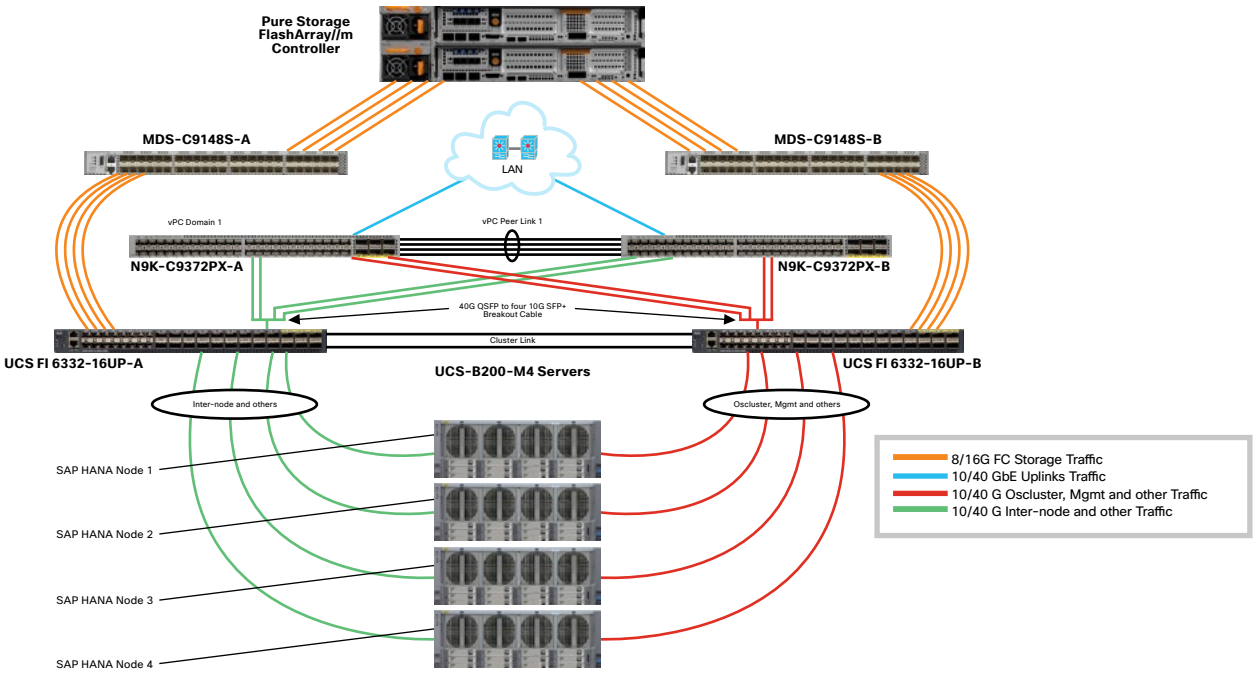
BUSINESS CHALLENGES

- SAP HANA TDI deployments are complicated and generally mission critical with high availability requirements. Customers face challenges maintaining these landscapes both in terms of time, available resources and operational cost
- Availability of pre-tested, scalable and best-in-class converged solution stack for optimizing enterprise workloads running SAP HANA database-based applications

SUMMARY

- A single platform built from unified compute, fabric and storage technologies, allowing you to scale to large-scale implementations without architectural changes
- Leverage a secure, integrated, and optimized converged stack that is pre-sized, configurable and deployable in a flexible manner for SAP HANA implementations.

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_saptdi.html

FlashStack for Oracle 12c RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC build, validate and predict performance of server, network and storage platform on a per workload basis
- Seamless scalability of performance and capacity to meet growth needs of Oracle database
- High availability of database instances without performance compromise through software and hardware upgrades

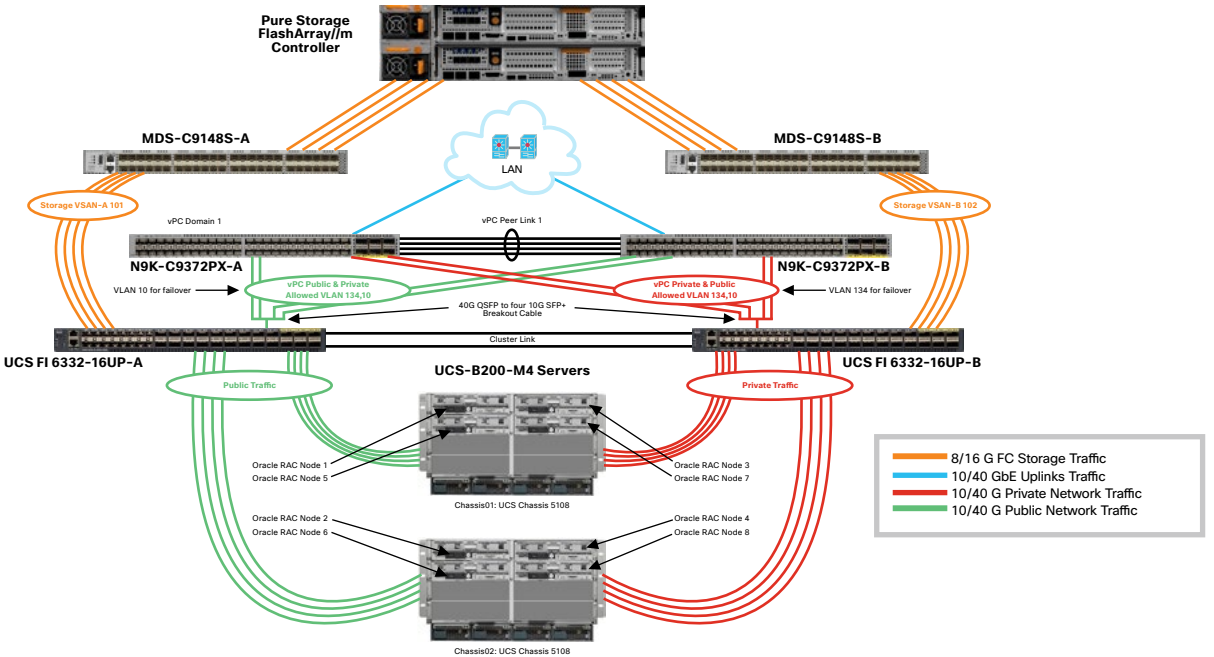
BUSINESS CHALLENGES

- Highly scalable architecture designed to meet a variety of scale-out application demands with seamless data integration and management
- Balancing enormous and evolving business requirement with a cost-efficient, high performing and always-available infrastructure
- Pre-tested, scalable converged solution for optimizing your challenging Oracle RAC performance and scalability

SUMMARY

- A cohesive, integrated system that is managed, serviced and tested as a whole
- Leverage a pre-validated platform to minimize business disruption and improve IT agility and reduce deployment time from months to weeks
- Guarantee customer success with prebuilt, pre-tested drivers, Oracle database software

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC.html

FlashStack VSI with Commvault for Data Protection

TECHNICAL HIGHLIGHTS

- High speed archive repositories using the Cisco S3260 servers
- VM data protection working with the native FlashArray//m snapshots
- Local, remote site, and cloud archiving options
- Live VM recovery and remote live synch

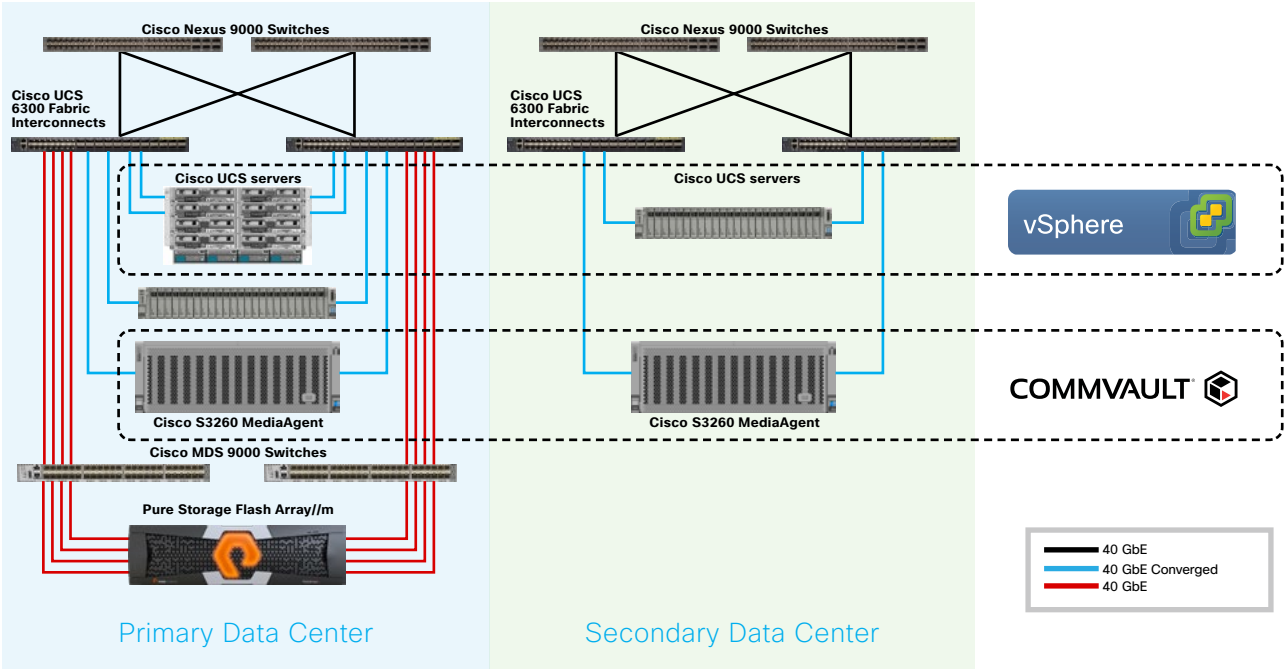
BUSINESS CHALLENGES

- Business continuity
- Multi-site data protection
- Fast and reliable RPTO

SUMMARY

- Modern data protection delivered within the FlashStack Virtual Server Infrastructure
- Full deployment walkthrough along with feature validation
- Total solution that brings together performance, efficiency, automation, availability, and recoverability

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_commvault.html

5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M4 Chassis
- 5,000 mixed RDSH & VCC users combined and infrastructure servers in four 5108 blade server chassis
- Nearly 1250 combined RDS-hosted server sessions and VCC users in 2 RU data center foot print
- Performance study with simulations of RDS-hosted server sessions and VCC typical desktop workloads
- Local resources replace SAN for workload files

BUSINESS CHALLENGES

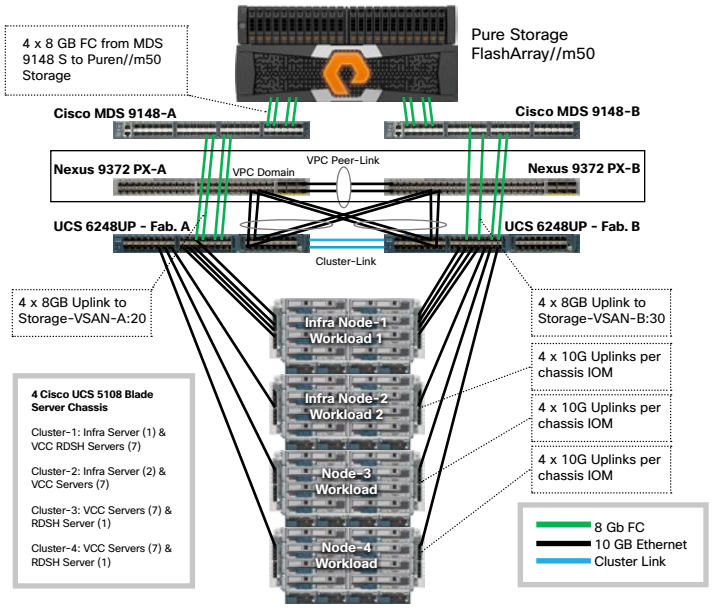
- Typical VMware Horizon View Desktops & RDS-hosted server sessions mixed workload combined users
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing VCC and RDSH solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Very good end user experience measuring <1 second for both VCC and RDSH users on cluster level and 5000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability

ARCHITECTURE

Physical Architecture



FlashStack Components

Network

2 Cisco 9372 PX Network Switches

2 Cisco 9148 S MDS Switches

Compute

4 Cisco 5108 Blade Server Chassis
2 Cisco B200 M4 Blade Servers For Infrastructure
30 Cisco B200 M4 Blade Servers For Workload

Storage

Pure FlashArray//m50
1 Base disck 40TB raw space
1 external disk shelf with 44TB raw space
(Total 88TB disk space)

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_view62_5k.html

5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2

TECHNICAL HIGHLIGHTS

- UCS 3.1(2b) with Broadwell support
- Cisco UCS Managed B 200 M4 (E5-2680v4) 28 servers, four clusters, N+1
- Nexus 9172PX 7.0(3)I2(2e), Nexus 1000V 5.2(1), 10 GE and FC switching
- VMware vSphere 6.0 update 2 Hypervisor
- Citrix XenDesktop, XenApp and PVS 7.9
- Pure Storage FlashArray//m50 84TB raw flash storage
- NVIDIA M6 graphics mezzanine card

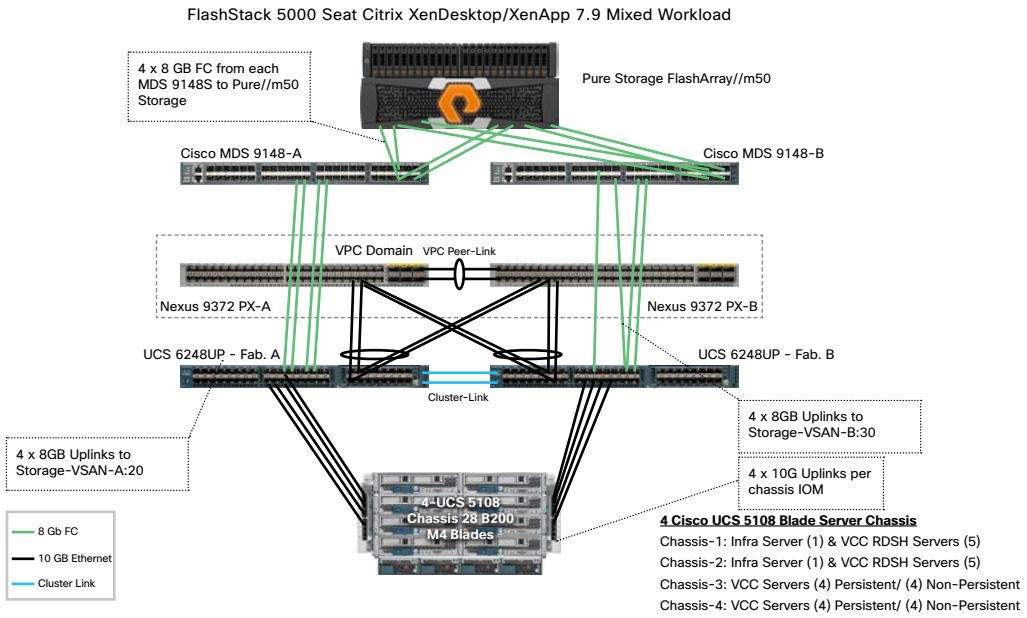
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Integration complexity
- Inefficient human resource utilization
- Complex, expensive operations
- Large scale deployment building blocks needed
- Requirement for outstanding end-user experience
- Graphics support
- Windows 10/Office 2016 transition

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center and FlashStack architecture
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment with rapid boot, excellent end user experience
- Mixed workload with pooled and persistent Windows 10 VCC and hosted shared server desktops
- Higher VM density per ESXi cluster
- Supported NVIDIA M6 graphics

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_XD79_5k.html

FlashStack Data Center with Oracle RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC build, validate and predict performance of server, network and storage platform on a per workload basis
- Seamless scalability of performance and capacity to meet growth needs of Oracle Database
- High availability of DB instances without performance compromise through software and hardware upgrades

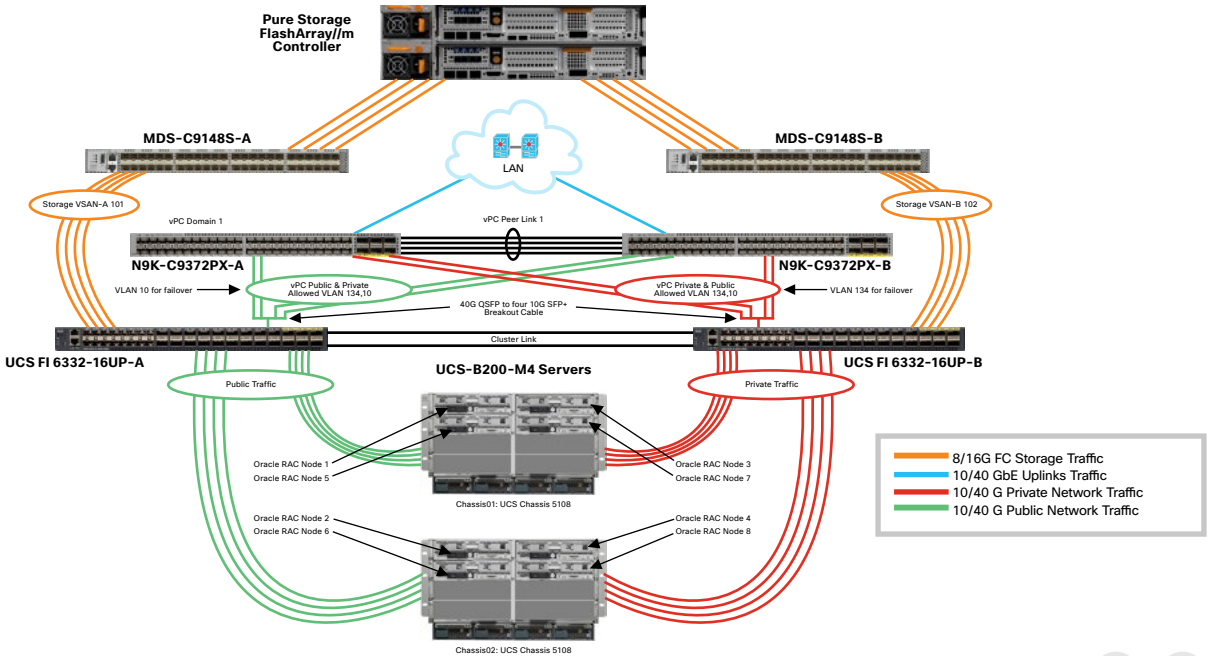
BUSINESS CHALLENGES

- A cohesive, integrated system that is managed, serviced and tested as a whole
- Leverage a pre-validated platform to minimize business disruption, improve IT agility and reduce deployment time from months to weeks
- Guarantee customer success with pre-built, pre-tested drivers, Oracle database software

SUMMARY

- Highly scalable architecture designed to meet a variety of scale-out application demands with seamless data integration and management
- Balancing enormous and continually evolving business requirements with a cost-efficient, high performing and always-available database infrastructure
- Pre-tested, scalable and best-in-class converged solution stack for optimizing your most challenging Oracle RAC database performance and scalability

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC.html

FlashStack Virtual Server Infrastructure

TECHNICAL HIGHLIGHTS

- Highly redundant throughout the design. Stateless servers, implemented through policy decisions, that are easily recovered from a SAN foundation
- APIs exposed at each layer of the infrastructure for easy management and integration with automation and ITSM tools
- High performance storage implemented with default compression and de-dupe

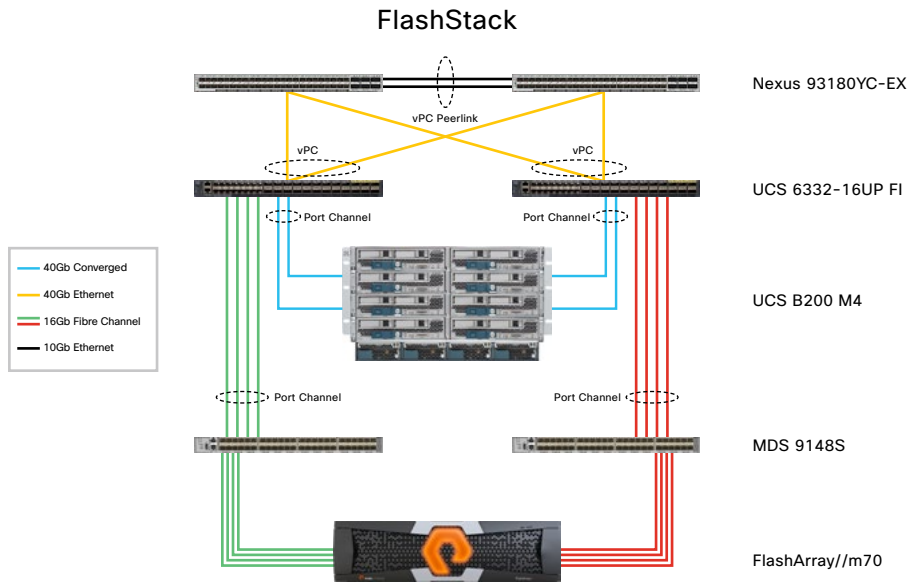
BUSINESS CHALLENGES

- Reliable, flexible and scalable platform for mixed workloads
- Simple and secure infrastructure that is easy to manage with standard tools
- Efficient infrastructure with lower total cost of ownership

SUMMARY

- Simple, resilient and powerful solution of validated converged infrastructure
- Best of breed products between Cisco and Pure Storage
- Documented in a detailed, easy to follow guide, of how to implement the architecture

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6_designs.html

Infrastructure

HYPERCONVERGED INFRASTRUCTURE

- Cisco HyperFlex 2.6 for Virtual Server Infrastructure – ***New***
- Cisco HyperFlex 2.5 for Virtual Server Infrastructure – ***New***
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users – ***New***
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users – ***New***
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users – ***New***
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments – ***New***
- SQL Server on HyperFlex All Flash
- Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage
- Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
- Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment
- Cisco HyperFlex Virtual Server Infrastructure
- Cisco HyperFlex with Veeam Availability Suite

Security threats are real, growing in both complexity and sophistication. Such threats place a heavy burden on organizations that need to increase their security resources to manage these risks. Organizations, however, find it challenging to find the best security solutions for their specific requirements and hate the inefficiencies of buying components from a broad range of vendors.

Cisco HyperFlex 2.6 for Virtual Server Infrastructure

TECHNICAL HIGHLIGHTS

- Support for HyperFlex on new M5 generation servers, including mixed M4 and M5 clusters
- First CVD to highlight Cisco Intersight cloud-based monitoring and management
- Scalable and flexible architecture: Expanded clusters with compute-only nodes, hybrid or all-flash converged nodes, mixed clusters, SED data-at-rest encryption, and VM replication

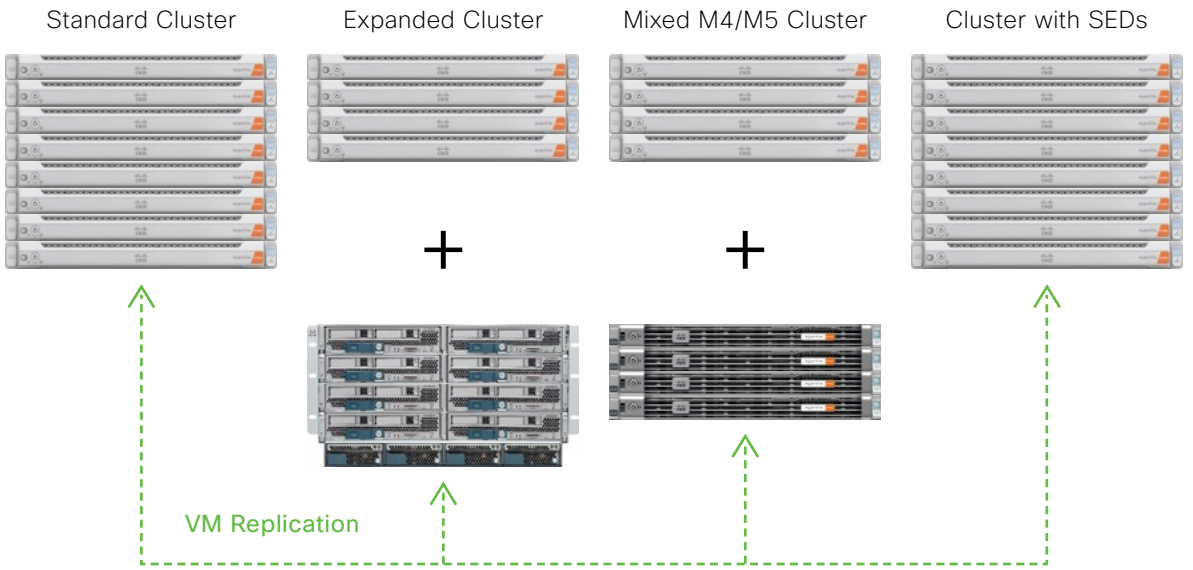
BUSINESS CHALLENGES

- Legacy and traditional converged environments rely on multiple technology stacks
- Significant technical debt and management silos
- Companies need faster deployment and more flexible options

SUMMARY

- Factory pre-integration work results in a rapid and simplified deployment
- Installation and expansion using the improved HyperFlex Installer OVA
- CVD highlights all product options, provides best practices, and provides day two instructions for all core features

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hyperflex_26_vsi.html

Cisco HyperFlex 2.5 for Virtual Server Infrastructure

TECHNICAL HIGHLIGHTS

- New enterprise class features including native replication and encryption
- Hybrid or All-Flash models to suit the VM and application workloads
- Scalable architecture with compute-only nodes creating extended compute-intensive clusters

BUSINESS CHALLENGES

- Legacy and traditional converged environments rely on multiple technology stacks
- Significant technical debt and management silos
- Companies need faster deployment and more flexible options

SUMMARY

- Factory pre-integration work results in a rapid and simplified deployment
- Installation and expansion using the improved HyperFlex Installer OVA
- CVD highlights all product options, and provides best practices and day two instructions for all core features

ARCHITECTURE

Hybrid or All-Flash Clusters

Plus Compute-Only Nodes:

Cisco Rack Mount Servers

or

Cisco Blade Servers

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hyperflex_25_vsi.html

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users

TECHNICAL HIGHLIGHTS

- 16 UCS HXAFC220-M4S rack servers, 8 UCS B200 M4 blade servers, 8 UCS C220 M4 rack servers (N+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.1.1b, UCSM 3.1(2g)
- Citrix XenDesktop 7.13
- Citrix Provisioning Services 7.13
- VMware vSphere 6.0 U3

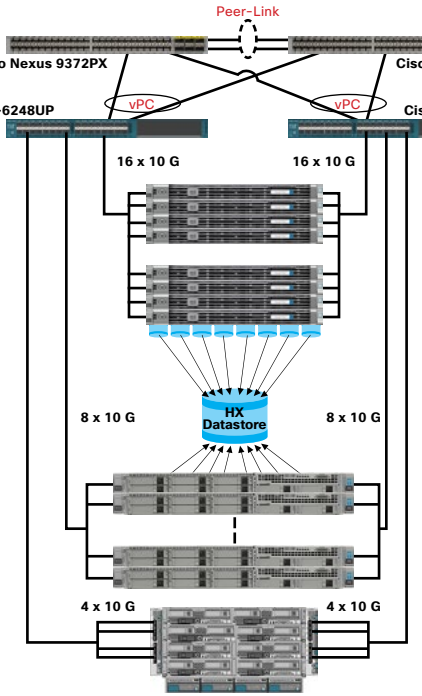
BUSINESS CHALLENGES

- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for Citrix XenDesktop 7.x tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE



8 x Cisco UCS C220 M4S Rack Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2680 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2680 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1340

16 x Cisco HXAF220C-M4S Rack Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2690 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured with drives per converged node
- 1 x 800GB Samsung Enterprise Performance (EP) SSD for Cache
- 10 x 960GB Samsung SATA Enterprise Value SSDs for capacity

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HXAF211b_4Kseat_XenDesk713.html

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 16 UCS HXAFC220-M4S rack servers, 8 UCS B200 M4 blade servers and 8 UCS C220 M4 rack servers (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.1.1b, UCSM 3.1(2g)
- VMware Horizon 7.1
- VMware vSphere 6.0 U3

BUSINESS CHALLENGES

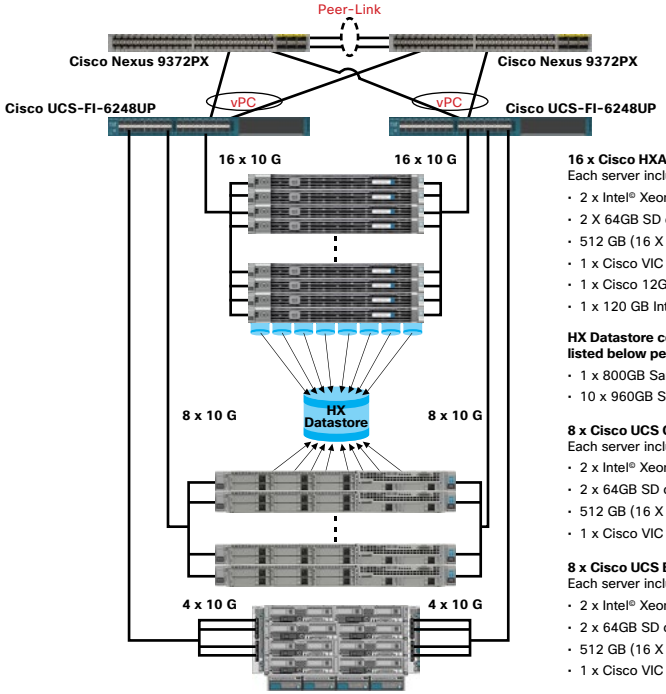
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



16 x Cisco HXAF220C-M4S Rack Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2690 v4 @ 2.6. GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool with drives listed below per node:
- 1 x 800GB Samsung Enterprise Perfomance (EP) SSD for Cache
- 10 x 960GB Samsung SATA Enterprise Value SSDs for capacity

8 x Cisco UCS C220 M4S Rack Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2680 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2680 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 X 32 GB DDR4) RAM
- 1 x Cisco VIC 1340

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HXAF211b_4Kseat_Horizon71.html

Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 4 UCS HXAFC220-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1a, UCSM 3.2(2b)
- VMware Horizon 7.3.1
- VMware vSphere 6.5 U1

BUSINESS CHALLENGES

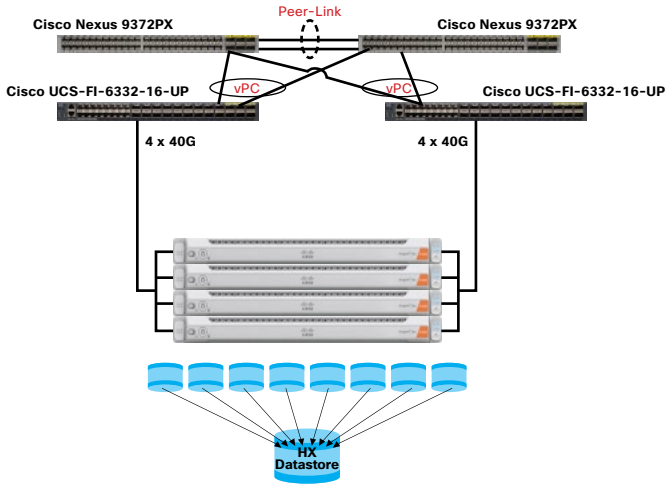
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



4 x Cisco HXAF220C-M5S Rack Servers
Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 240GB M.2 SATA SSD
- 768 GB (12 X 64GB DDR4) RAM
- 1 x Cisco VIC 1387 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 240 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool or Server 2016 RDS Pool with drives listed below per node:

- 1 x 400GB Toshiba Enterprise Performance (EP) SSD for Cache
- 8 x 960GB Samsung SATA Enterprise Value SSDs for capacity

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hx26_vdi_600seat_horizon.html

Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments

TECHNICAL HIGHLIGHTS

- Integrated UCS Management for HyperFlex and S3260 storage server and single Veeam console to manage backup and replication of VM across several HyperFlex clusters across geography
- Storage integration of Cisco HyperFlex with Veeam providing HX native snapshots and higher backup throughput through HX storage network
- All-in-one, scalable and easy-to-deploy validated design and deployment guide for multisite HyperFlex, Veeam and Cisco UCS S3260 storage server

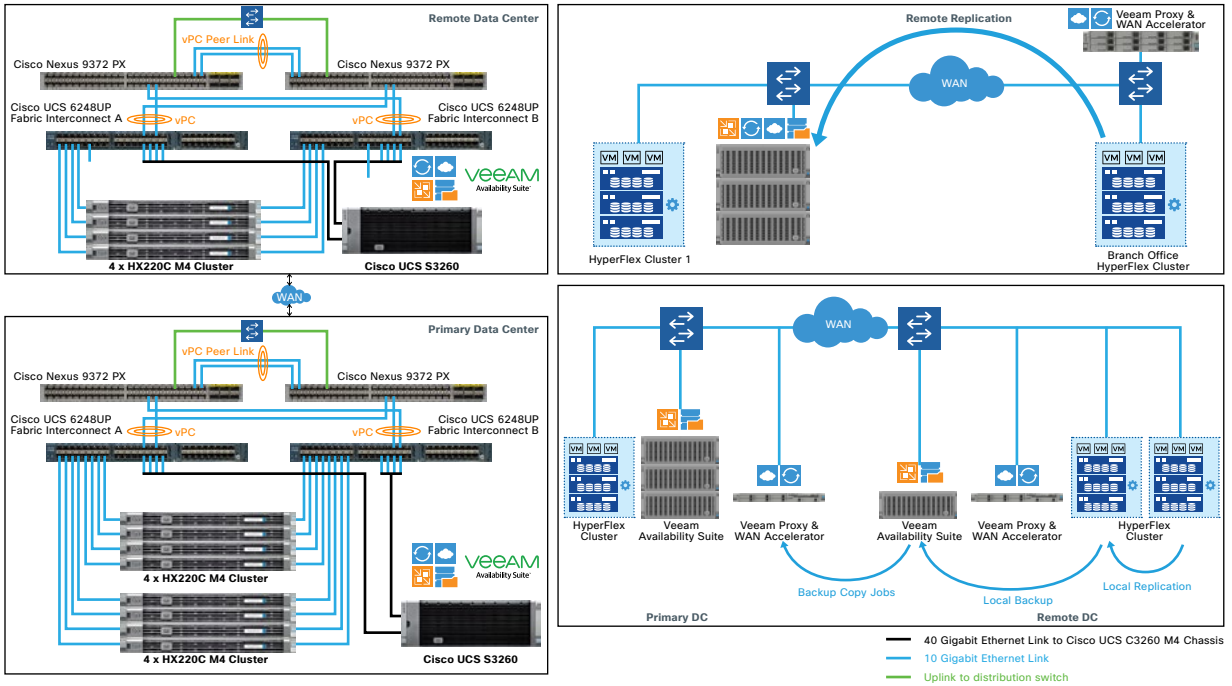
BUSINESS CHALLENGES

- High RPO/RTO with multiple hours of restore & backup time for 24/7 business critical applications on Cisco HyperFlex
- High OPEX in managing data protection endpoints for HyperFlex clusters in multiple sites across geography
- Replication of application VM deployed across data centers on HyperFlex clusters

SUMMARY

- Enable RPO/RTO's < 15 minutes with instant VM Recovery™, Veeam Explorer™ for Microsoft Exchange, Active Directory, SharePoint, and SQL server, Veeam Explorer for Oracle
- Scalable Veeam Repository on UCS Managed S3260 storage servers and C240 M4 LFF rack servers
- Best practices to deploy multisite HyperFlex cluster with Veeam and Cisco UCS S3260 storage server

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/dataprotection_hx_veeam_multisite.html

SQL Server on HyperFlex All Flash

TECHNICAL HIGHLIGHTS

- Highly available and robust platform for consolidating SQL databases
- Delivers consistent high performance with low latency, and scale the performance with ease
- Designed to absorb ad-hoc workloads
- Cisco Veeam integrated backup appliance for transactionally consistent database backups

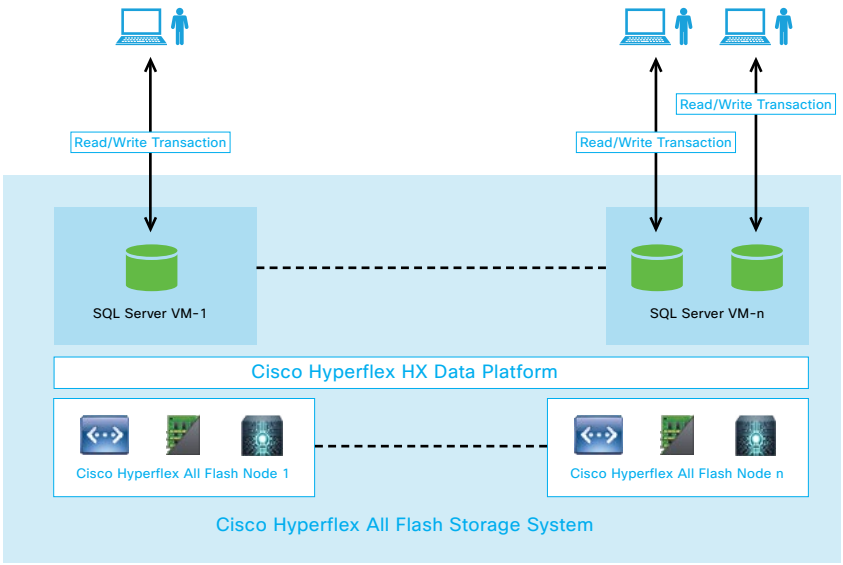
BUSINESS CHALLENGES

- SQL server database sprawl
- Need for consistent performance with low latencies
- Ad-hoc database workloads
- Need for robust and integrated backup solution

SUMMARY

- CVD describing the best practices and recommendations for configuring and deploying SQL databases on HyperFlex All Flash Systems
- Deployment options for highly available SQL databases using AlwaysOn
- SQL database performance numbers for workloads with medium and large working sets

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hyperflex_2_0_mssql_af.html

Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage

TECHNICAL HIGHLIGHTS

- Creation of Cisco HyperFlex cluster with HX-series all-flash or hybrid nodes, plus option for hybrid cluster using Cisco UCS compute-only servers
- Connecting Cisco HyperFlex cluster to third-party FC or iSCSI storage arrays
- Detailed UCS and HyperFlex design descriptions, functional operation and best practices

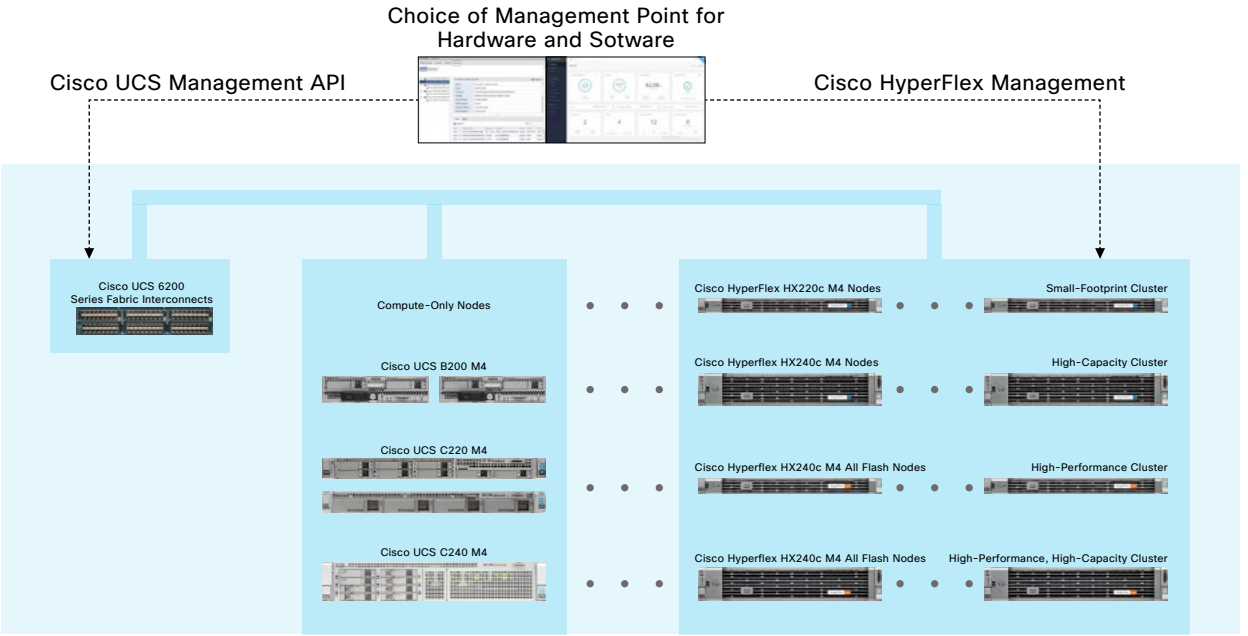
BUSINESS CHALLENGES

- Rapid deployment of virtual environments using built-in server storage versus dedicated traditional arrays
- Software-defined all-flash storage solution expands the applications for performance-sensitive workloads
- Complete end-to-end hyperconverged solution with enterprise class features

SUMMARY

- Introduction of the first release of Cisco HyperFlex all-flash systems
- Simplified procedure to connect HX cluster to external storage devices
- Best practice for HXDP software version 2.0.1a

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hyperflex_201a_vsi.html

Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 8 UCS HXC240-M4SX rack servers and 8 UCS B200 M4 blade server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 1.8.1c, UCSM 3.1(2b)
- VMware Horizon 7
- VMware vSphere 6.0

BUSINESS CHALLENGES

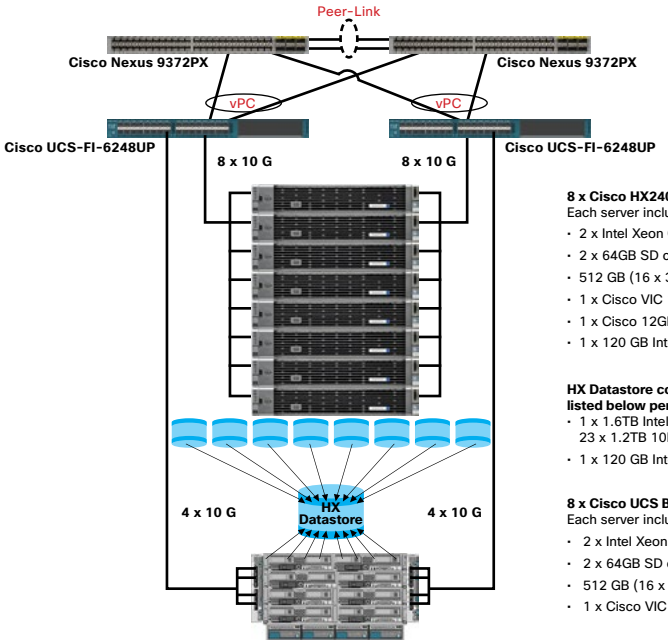
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless data center integration and management, and energy efficiency
- Enterprise-grade virtual client computing solution with excellent end user experience
- Best practices for installation and deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



8 x Cisco HX240C-M4S Rack Servers
Each server includes:
- 2 x Intel Xeon CPU E5-2690 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 x 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool with drives listed below per node:
- 1 x 1.6TB Intel SATA Enterprise Value SSD for Cache
  23 x 1.2TB 10K RPM SAS HDDs for capacity
- 1 x 120 GB Intel SATA Enterprise Value SSD

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel Xeon CPU E5-2690 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 x 32GB DDR4) RAM
- 1 x Cisco VIC 1340

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX18_VDI_2000seat_horizon.html

Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment

TECHNICAL HIGHLIGHTS

- Integrated UCS Management for HyperFlex and S3260 storage server
- Single Veeam console to manage backup and replication of application VM across several HyperFlex clusters
- All-in-one, scalable and easy-to-deploy validated design and deployment guide for Veeam, HyperFlex and Cisco UCS S3260 storage server

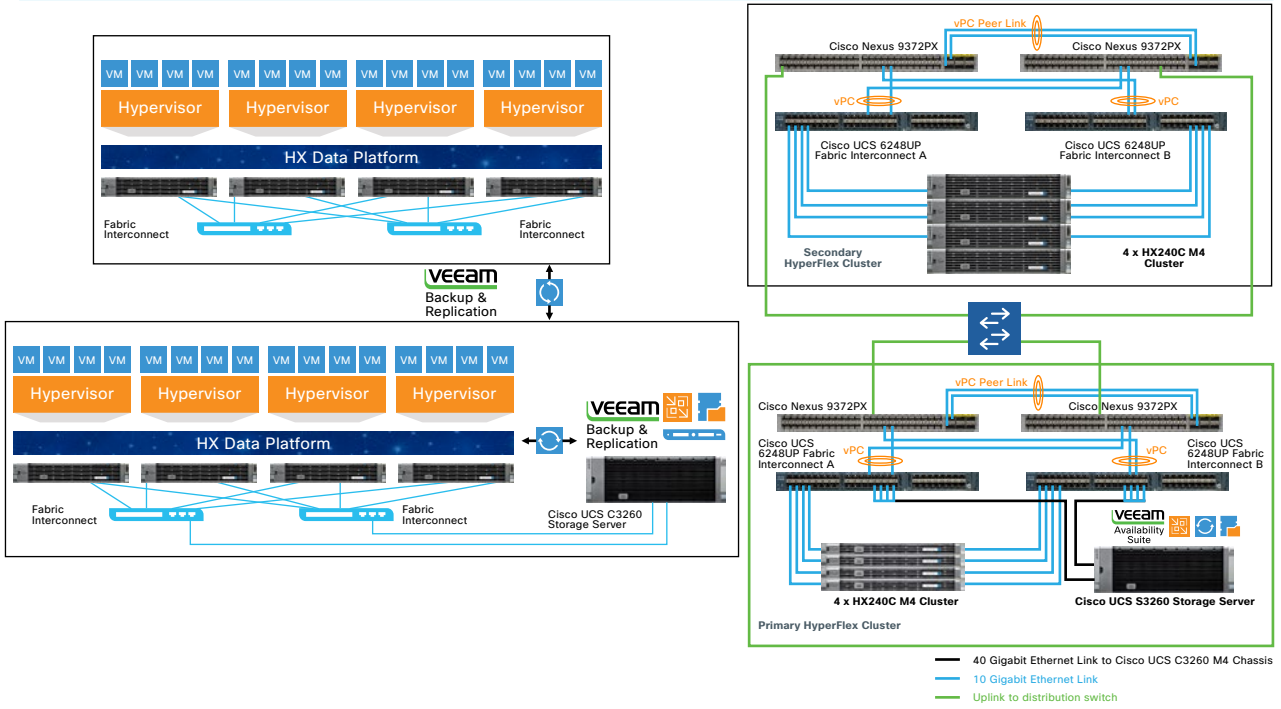
BUSINESS CHALLENGES

- High RPO/RTO with multiple hours of restore time or data loss for 24/7 business critical applications
- High OPEX in managing data protection endpoints for multiple HX clusters in remote offices deployed across geography
- Single solution to deploy, configure and optimize HX backup and replication with Veeam 9.5 and Cisco S3260 Storage Server

SUMMARY

- Enable RPO/RTO's < 15 minutes with Instant VM Recovery™, Veeam Explorer™ for Microsoft Exchange, Active Directory, SharePoint, and SQL Server, Veeam Explorer for Oracle
- Scalable Veeam repository on UCS Managed S3260 storage servers
- Best practices to deploy HyperFlex cluster with Veeam and Cisco UCS S3260 storage server

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX181_dataprotection_Veeam95.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX181_dataprotection_AS902_design.html

Cisco HyperFlex Virtual Server Infrastructure

TECHNICAL HIGHLIGHTS

- 8 HX220 or HX240 rackmount servers, plus option for hybrid cluster using B200 compute-only blades
- Detailed UCS and HyperFlex design descriptions, functional operation and best practices
- Manual installation guide for systems not installed via factory automated process

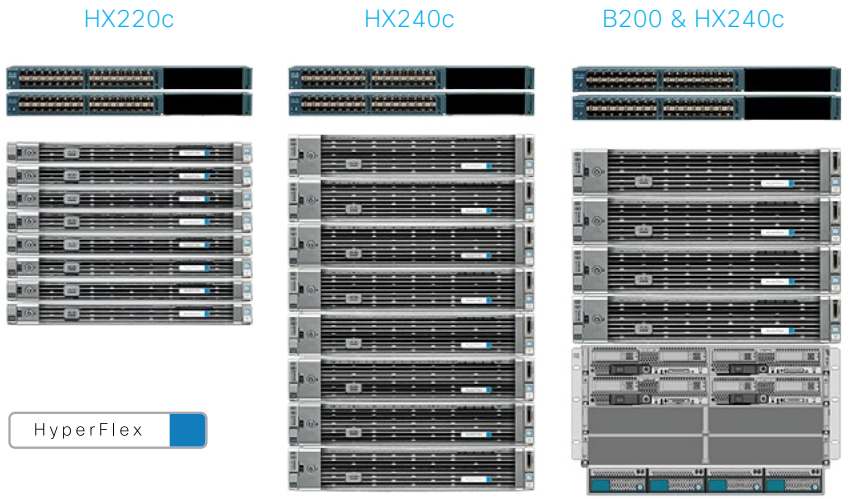
BUSINESS CHALLENGES

- Rapid deployment of virtual environments using built-in server storage versus dedicated traditional arrays
- Scalable virtual environments that can grow on demand as workloads dictate
- Enterprise class storage features without purchasing traditional arrays from legacy vendors

SUMMARY

- First CVD release for the new Cisco HyperFlex platform
- Installation of standard and hybrid HX clusters using Springpath and Cisco developed tools
- Best practices for HX software version 1.7.1

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX171_VSI_ESXi6U2.html

Cisco HyperFlex with Veeam Availability Suite

TECHNICAL HIGHLIGHTS

- Integrated UCS Management for HyperFlex and C3000 storage server
- Single Veeam console to manage backup and replication if application VM across several HyperFlex clusters
- All-in-one, scalable and easy-to-deploy validated design combining Veeam, HyperFlex and Cisco UCS C3000 storage for ROBO and distributed data center

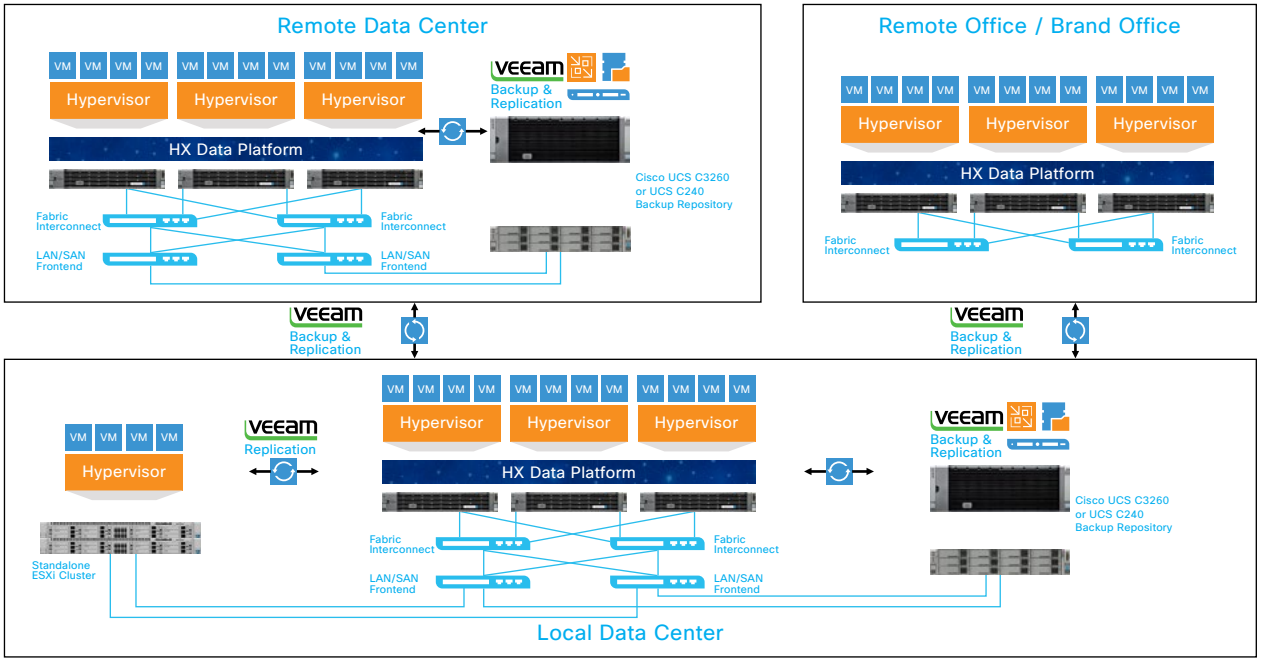
BUSINESS CHALLENGES

- High RPO/RTO with multiple hours of restore time or data loss for 24/7 business critical applications
- High OPEX in managing data protection endpoints for multiple HX clusters in remote offices deployed across geography
- Single solution to provision data protection for HyperFlex clusters deployed in ROBO or distributed across multiple data centers

SUMMARY

- Enable RPO/RTO's < 15 minutes with Instant VM Recovery™, Veeam Explorer™ for Microsoft Exchange, Active Directory, SharePoint, and SQL Server, Veeam Explorer for Oracle
- Scalable Veeam Repository on UCS Managed C3000 storage servers
- Best practices to deploy HyperFlex cluster with Veeam and Cisco UCS C3000 storage server

ARCHITECTURE



Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX181_dataprotection_AS902_design.html

Infrastructure

SECURITY

- Secure Enclave Architecture

Security threats are real, growing in both complexity and sophistication. Such threats place a heavy burden on organizations that need to increase their security resources to manage these risks. Organizations, however, find it challenging to find the best security solutions for their specific requirements and hate the inefficiencies of buying components from a broad range of vendors.

Secure Enclave Architecture

TECHNICAL HIGHLIGHTS

- Extensions of Cisco's integrated systems built on Cisco UCS and Nexus switching
- Integrates security products such as Cisco TrustSec ASA, IPS, VSG, NGA, ISE and technology partners
- Automation via UCS Director

SUMMARY

- Consistent approach to infrastructure deployment and security posture
- Flexible consumption model to meet application and business requirements
- Addresses the attack continuum using a "Before, During and After" approach
- Automation of well-known and well-understood resource pools

BUSINESS CHALLENGES

- Transition to cloud, Internet of Everything
- Dynamic Threat Landscape
  - No perimeter
- Complexity and Fragmentation
  - Inconsistent security policy and enforcement

ARCHITECTURE

Cisco Integrated Infrastructures + **Cisco and Partner Security Technologies**

Design: http://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-manager/whitepaper-c07-731204.html
FlexPod CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_sea.pdf

Applications

ORACLE

Virtual

- FlexPod Datacenter with Oracle RAC on Oracle Linux
- FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1
- Oracle JD Edwards on UCS / EMC VNX with Oracle VM

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

FlexPod Datacenter with Oracle RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- Cisco UCS 2.2(3a) and NetApp FAS 8080 with Oracle 12c RAC and Oracle Linux
- A single platform built from unified compute, fabric, and storage technologies, allowing you to scale to large-scale data centers without architectural changes.
- NetApp FAS Hybrid Arrays with Flash Pool™ and Cisco UCS running OLTP and DSS databases together.

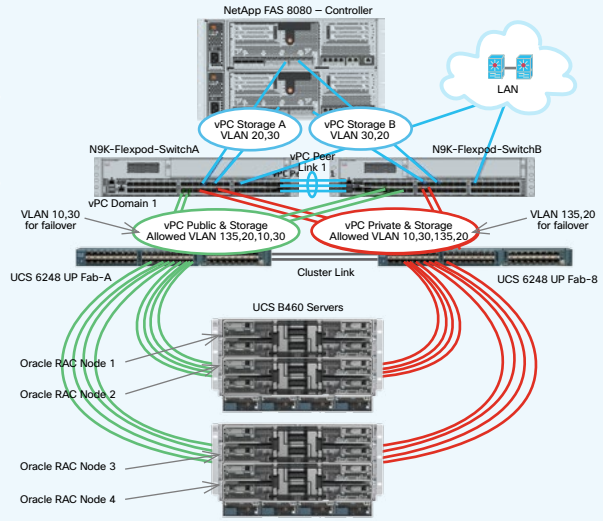
BUSINESS CHALLENGES

- Balancing large and continually evolving business requirement with a cost -efficient, high performing and always-available database infrastructure.
- Pre-tested, scalable and best-in-class converged solution stack for optimizing your most challenging Oracle RAC database.
- Oracle RAC must exude the highest level of flexibility, performance, scalability and resilience.

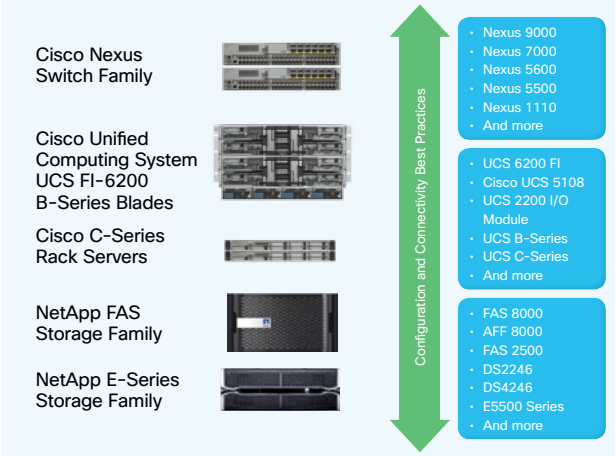
SUMMARY

- Integrated Compute, Network & Storage Solution.
- Centralized, simplified management of infrastructure resources, including end-to-end automation.
- Hardware level redundancy for all major components using Cisco UCS and NetApp availability features.

ARCHITECTURE



FlexPod Data Center Solution with UCS



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcrac_12c_bm.html

FlexPod Datacenter for Oracle RAC 11gR2 on OVM 3.1.1

TECHNICAL HIGHLIGHTS

- Oracle Database 11g R2 RAC
- Oracle VM Release 3.1.1
- Multi-hop FCoE
- Boot from FCoE
- NetApp Data ONTAP 8.2

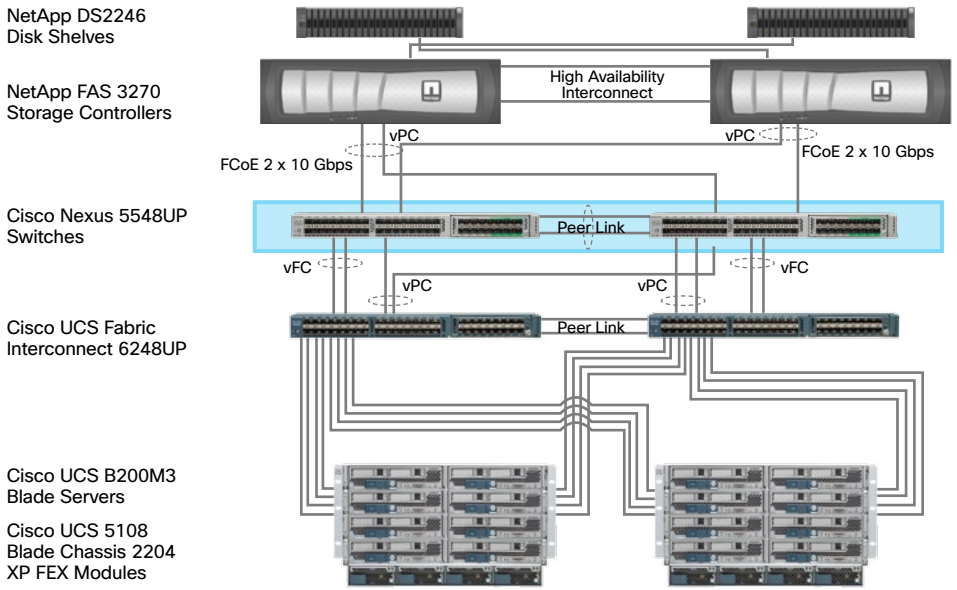
BUSINESS CHALLENGES

- Need high availability
- Require rapid provisioning
- Under utilized servers
- Database server consolidation
- Lower Oracle licensing costs

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- A flexible and cooperative support model that resolves issues rapidly and spans across new and legacy products
- Cisco UCS combined with a highly scalable NAS platform from NetApp provides the ideal combination for Oracle's unique, scalable, and highly available NFS technology

ARCHITECTURE



CVD: http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcracovm_fcoe.html

Oracle JD Edwards on UCS / EMC VNX with Oracle VM

TECHNICAL HIGHLIGHTS

- Scalable architecture with Cisco UCS blade servers, EMC VNX and Oracle VM
- Step-by-step guide to deploy Oracle JD Edwards environment on Oracle VM with 2-node Oracle RAC database
- Performance characterization of JD Edwards E1 Day in the Life Kit (DIL Kit) for interactive apps and batch processes (UBEs)
- Best practices, tuning recommendations and sizing guidelines to virtualize Oracle JD Edwards on Cisco UCS infrastructure

BUSINESS CHALLENGES

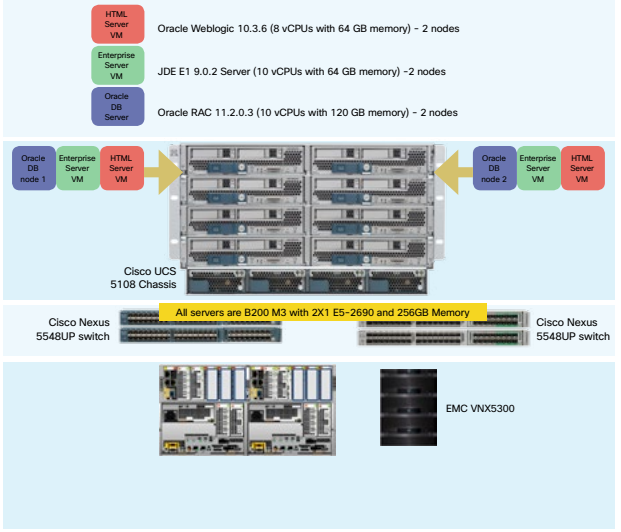
- Improve operational efficiency and optimize resource utilization
- Business-critical apps require 24x7 availability with efficient infrastructure management and improved ROI
- Co-existence of multiple JD Edwards environments, ease in scaling of interactive apps and low response time for online and batch processes

SUMMARY

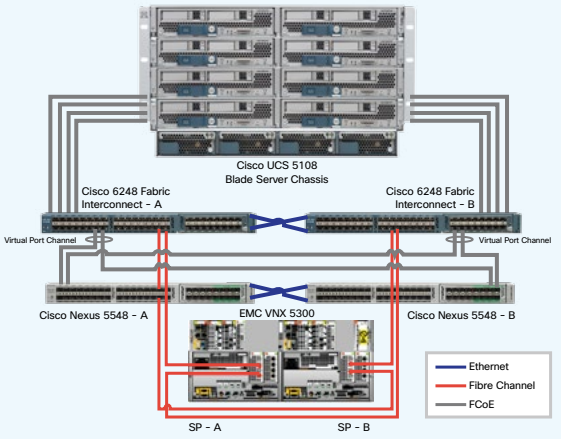
- Demonstrate scaling of Oracle JD Edwards on Oracle virtualized environment with farm of batch and interactive VMs
- Integration of compute, network, and storage on Oracle VM
- Reduced downtime and easy server deployment and migration with Cisco UCS service profiles

ARCHITECTURE

Overview



Deployment Architecture



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_jde_ovm_emc.html

Applications

ORACLE

Physical Server

- FlashStack Data Center with Oracle RAC 12cR2 Database – ***New***
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack Data Center with Oracle RAC on Oracle Linux
- Oracle RAC 11gR2 with Oracle Linux 6.4 on Hitachi VSP G1000
- FlexPod with Oracle RAC
- Oracle JD Edwards on FlexPod
- Oracle Siebel on UCS / EMC VNX
- Oracle PeopleSoft on Cisco UCS and EMC VNX Storage
- Oracle 12c RAC on Cisco UCS & EMC VNX 8000

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

FlashStack Data Center with Oracle RAC 12cR2 Database

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC, validated performance of server, network and NVMe all-flash storage on a per workload basis
- Seamless Oracle performance and scalability with data reduction to meet growth needs
- Maintain highly available database instances through software and hardware upgrades without compromising performance

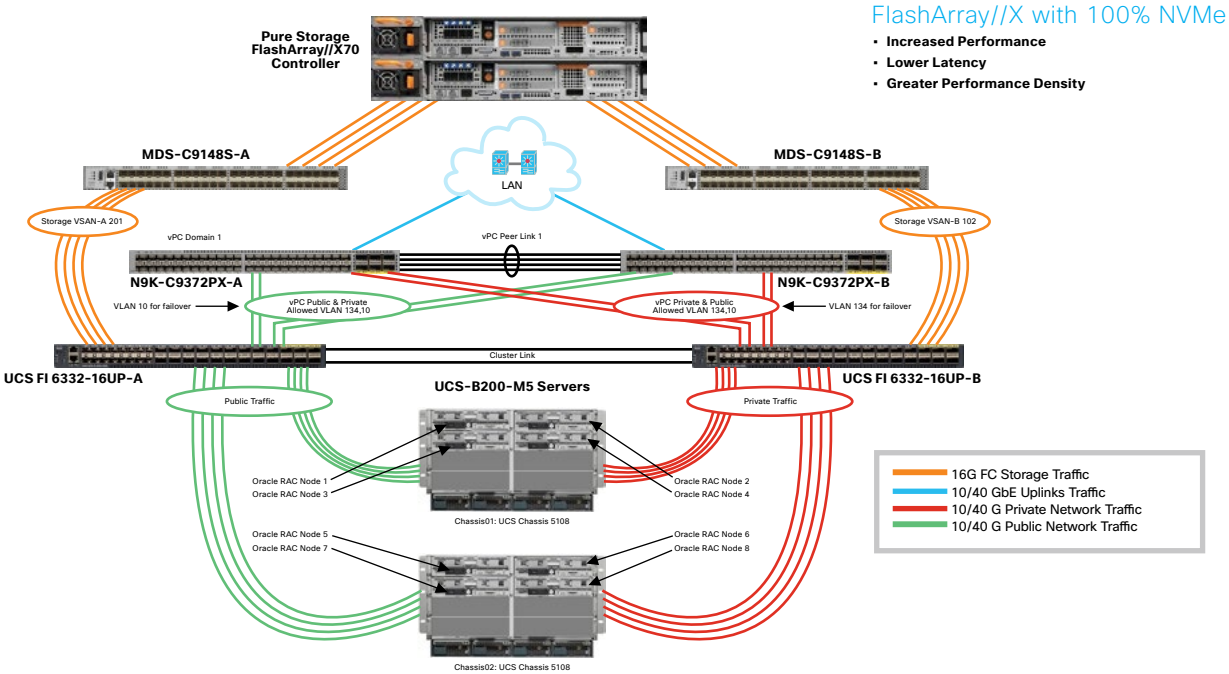
BUSINESS CHALLENGES

- New design targets a variety of scale-out application demands for database consolidation, management, and seamless date integration
- A cost-efficient, high performing and always-available infrastructure that balances enormous and evolving business requirements
- Pre-tested converged infrastructure that optimizes your mission critical Oracle performance and scalability requirements

SUMMARY

- A pre-validated integrated system managed, serviced, and tested as a complete offering
- Minimizes business disruption and improves IT agility while reducing deployment time
- Improved customer success backed by Cisco Systems and Pure Storage

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC12cr2.html

FlashStack for Oracle 12c RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC build, validate and predict performance of server, network and storage platform on a per workload basis
- Seamless scalability of performance and capacity to meet growth needs of Oracle database
- High availability of database instances without performance compromise through software and hardware upgrades

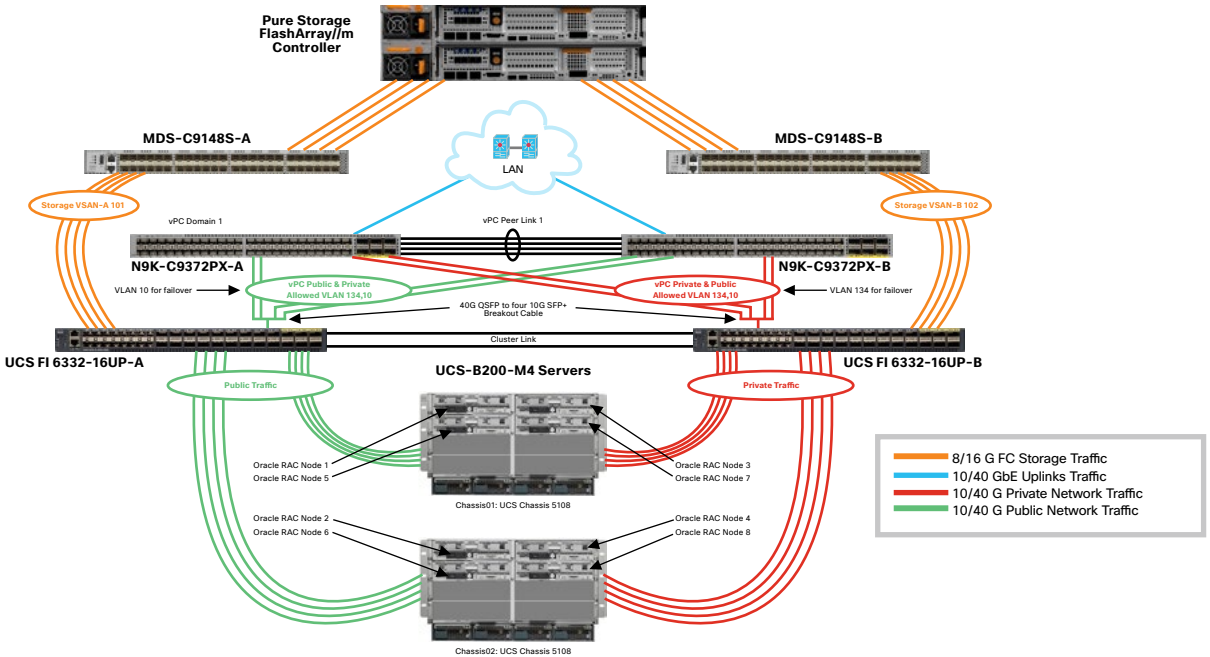
BUSINESS CHALLENGES

- Highly scalable architecture designed to meet a variety of scale-out application demands with seamless data integration and management
- Balancing enormous and evolving business requirement with a cost-efficient, high performing and always-available infrastructure
- Pre-tested, scalable converged solution for optimizing your challenging Oracle RAC performance and scalability

SUMMARY

- A cohesive, integrated system that is managed, serviced and tested as a whole
- Leverage a pre-validated platform to minimize business disruption and improve IT agility and reduce deployment time from months to weeks
- Guarantee customer success with prebuilt, pre-tested drivers, Oracle database software

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC.html

FlashStack Data Center with Oracle RAC on Oracle Linux

TECHNICAL HIGHLIGHTS

- 8 node Oracle RAC build, validate and predict performance of server, network and storage platform on a per workload basis
- Seamless scalability of performance and capacity to meet growth needs of Oracle Database
- High availability of DB instances without performance compromise through software and hardware upgrades

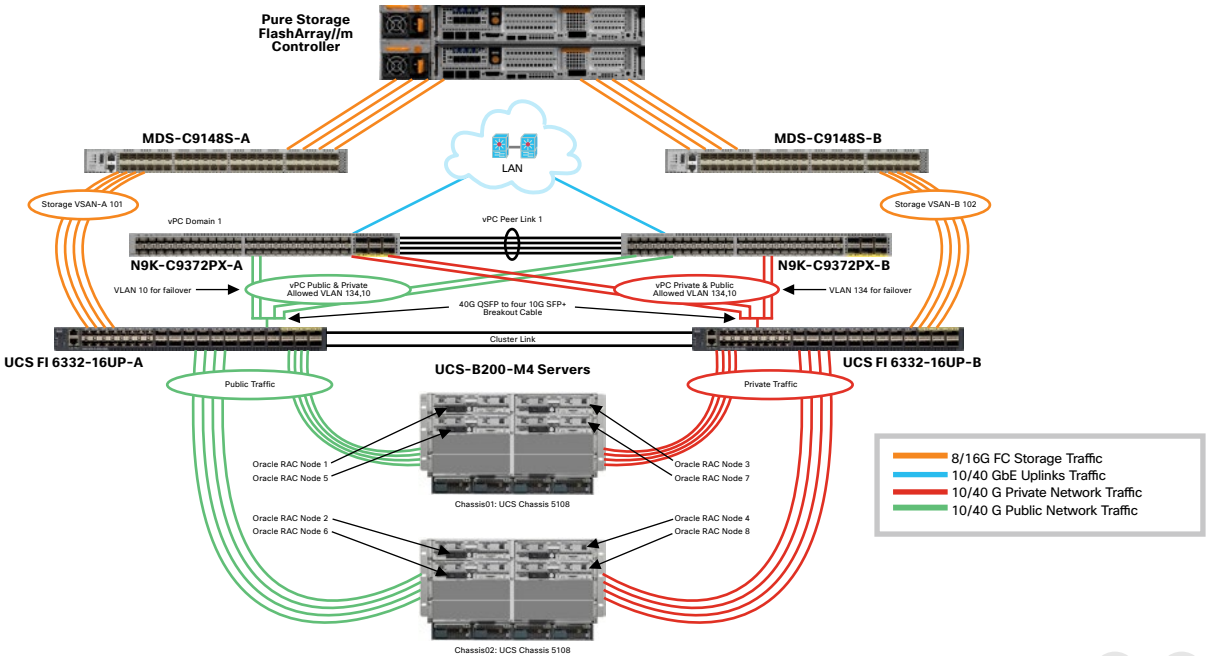
BUSINESS CHALLENGES

- A cohesive, integrated system that is managed, serviced and tested as a whole
- Leverage a pre-validated platform to minimize business disruption, improve IT agility and reduce deployment time from months to weeks
- Guarantee customer success with pre-built, pre-tested drivers, Oracle database software

SUMMARY

- Highly scalable architecture designed to meet a variety of scale-out application demands with seamless data integration and management
- Balancing enormous and continually evolving business requirements with a cost-efficient, high performing and always-available database infrastructure
- Pre-tested, scalable and best-in-class converged solution stack for optimizing your most challenging Oracle RAC database performance and scalability

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_oracleRAC.html

Oracle RAC 11gR2 with Oracle Linux 6.4 on Hitachi VSP G1000

TECHNICAL HIGHLIGHTS

- Cisco UCS 2.2(2c) and Hitachi VSP G1000 with Oracle 11g R2 RAC
- Boot-over-SAN capabilities with Oracle Linux UEK 6.4
- Hitachi Dynamic Tiering using different disks drives like FMD, SAS and NL-SAS

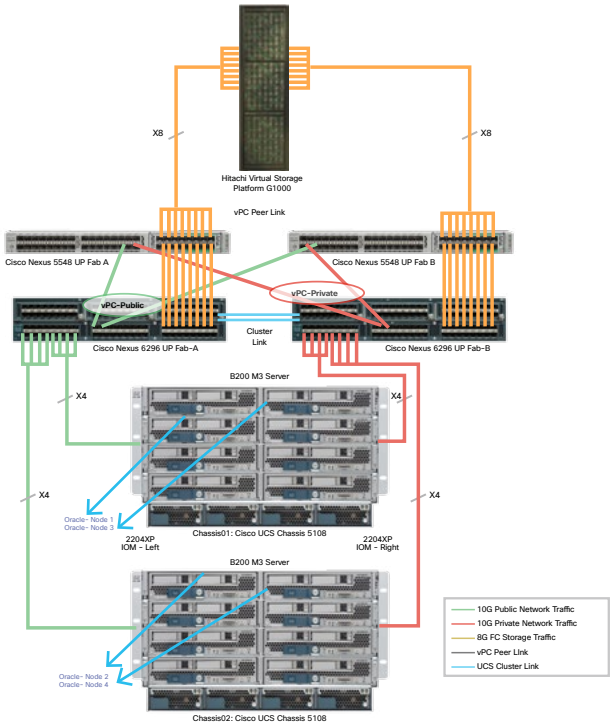
BUSINESS CHALLENGES

- Balancing enormous and continually evolving business requirement with a cost -efficient, high performing and always-available database infrastructure
- Pre-tested, scalable and best-in-class converged solution stack for optimizing your most challenging Oracle RAC database
- Oracle RAC must exude the highest level of flexibility, performance, scalability and resilience

SUMMARY

- Integrated compute, network & storage solution
- Hitachi Dynamic Tiering software automatically optimizes data placement
- Service profile failover concepts to reduce MTTR

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_hds_orac11gr2.pdf

FlexPod with Oracle RAC

TECHNICAL HIGHLIGHTS

- UCS 2.1(1a) with physical server Oracle Linux running on FlexPod
- Boot-over-SAN capabilities with Oracle RAC 11gR2
- Performance validation of a 4node RAC with Direct NFS (dNFS)

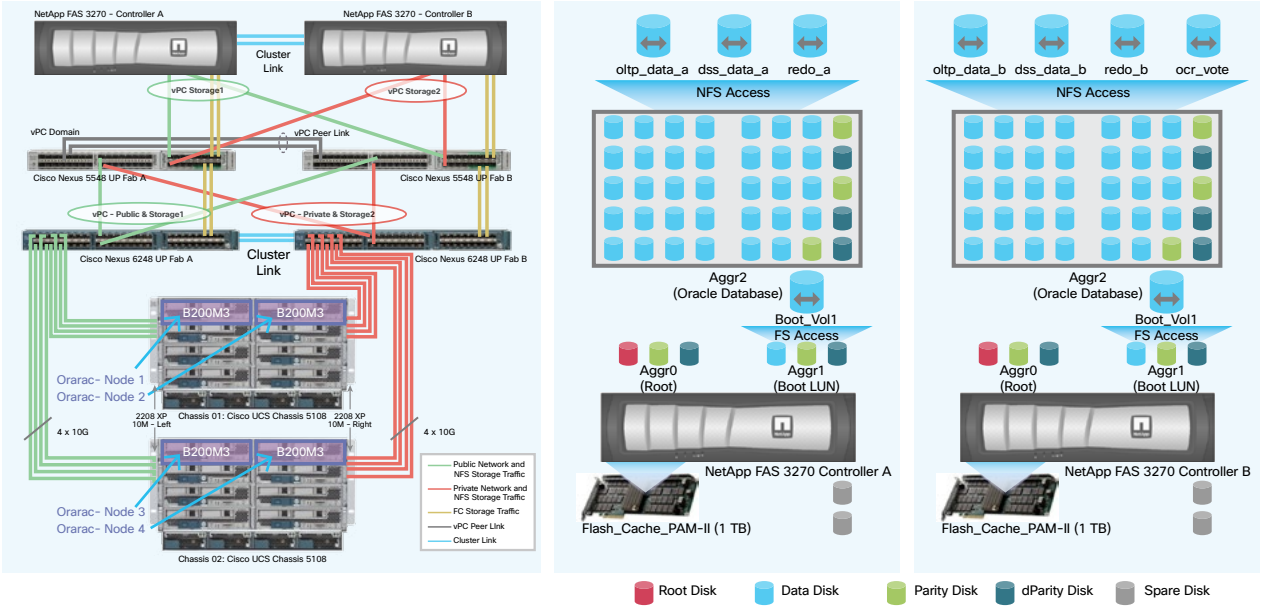
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Need a balanced configuration
- Require best practices for customers looking to run Oracle RAC on FlexPod
- Need improved availability and linear scalability

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable and resilient system

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_orcracbm.html

Oracle JD Edwards on FlexPod

TECHNICAL HIGHLIGHTS

- UCS 2.1(1a) with FlexPod (7-mode)
- Support for Oracle Linux 5.8 (RH kernel) with Oracle RAC 11.2.0.3
- Performance validation and benchmark of both JDE interactive and batch apps
- NetApp clustered Data ONTAP 8.1.2

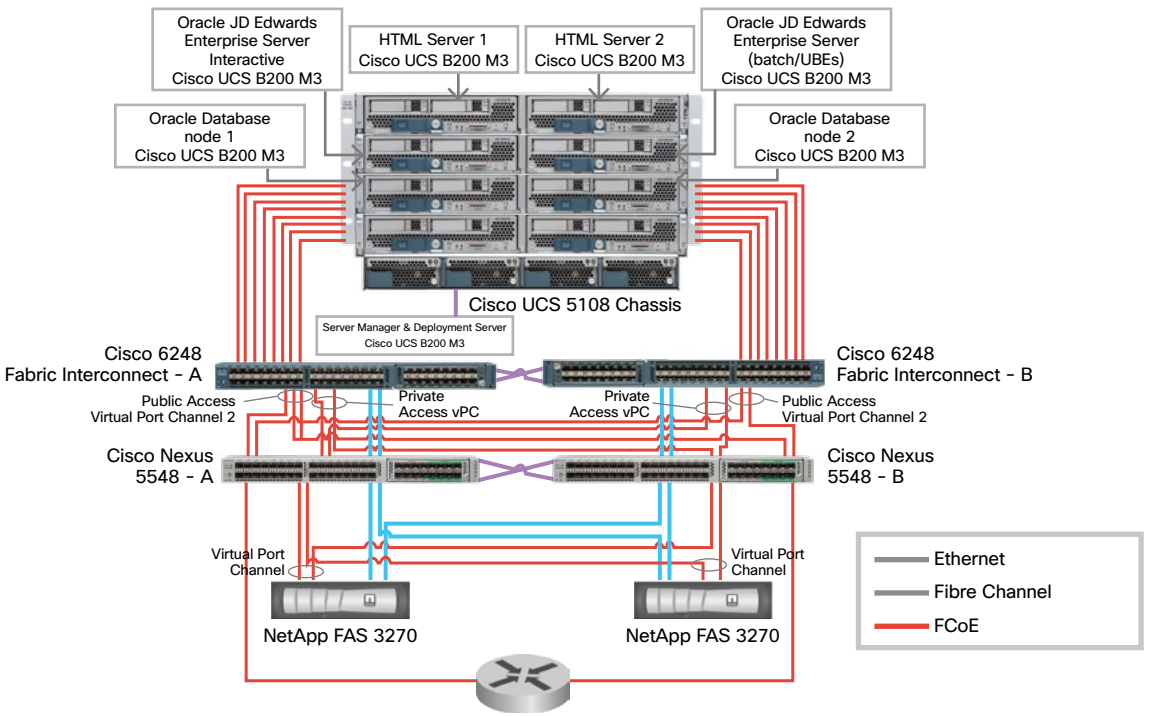
BUSINESS CHALLENGES

- Customers looking to lower TCO by migrating from older infrastructure primarily on AS/400
- Migrating customers opting for integrated compute & storage platform, and FlexPod with RedStack proves to be a clear alternative
- Customers looking for an end-to-end solution on Intel® Xeon™ based h/w and none of the h/w vendors have established a complete JDE solution on Oracle Linux with Oracle RAC

SUMMARY

- Integration compute and storage solution with FlexPod
- Joint publication with Cisco-Oracle-NetApp
- Best-in-class batch and interactive performance with lower TCO
- High-performance, scalable and resilient system

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/Flexpod_orcjde_bm.html

Oracle Siebel on UCS / EMC VNX

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M2 blades
- Unified storage for FC and NFS traffic (EMC VNX5500)
- Small/Medium/Large implementations addressing 600, 3000, 10000 concurrent users
- Performance study with simulations of typical CRM transactions from eComm / eSales / EAI applications

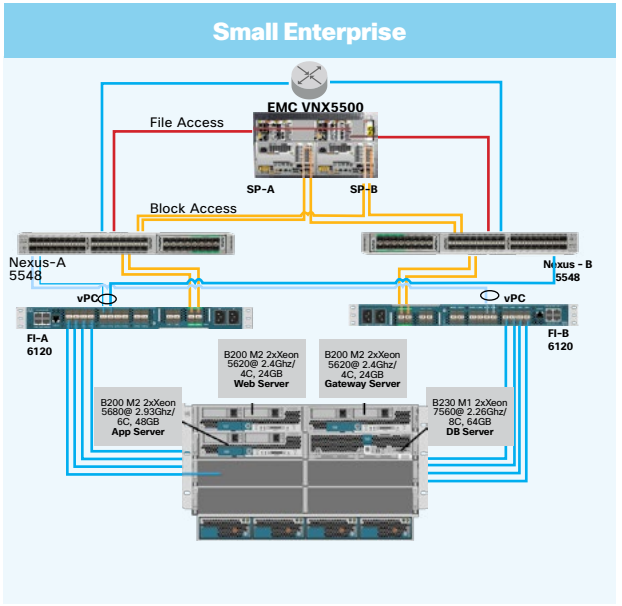
BUSINESS CHALLENGES

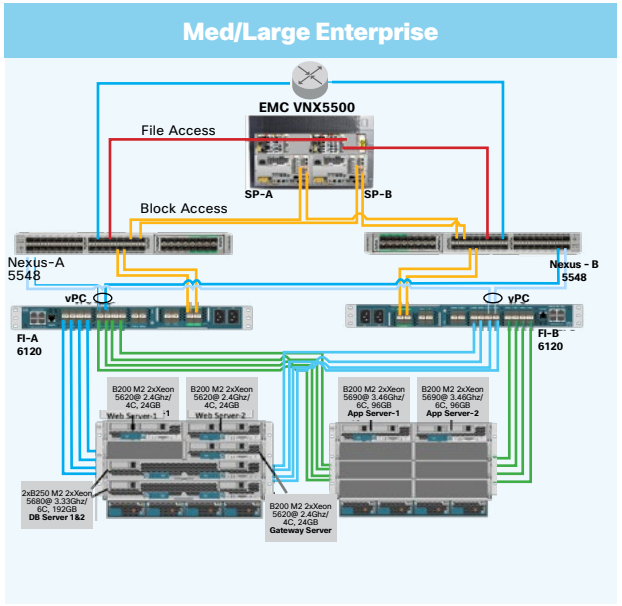
- Complex and heavy workloads
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand fast response times and high throughput as Siebel is typically used in front office/ customer relationship scenarios

SUMMARY

- High-performance, scalable and resilient solution
- UCS “service profile” approach helps faster flexible deployments in short notice

ARCHITECTURE





CVD: http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_oracle_siebel.html

Oracle PeopleSoft on Cisco UCS and EMC VNX Storage

TECHNICAL HIGHLIGHTS

- Manageability, operation efficiency, and flexibility than comparable data center platforms were demonstrated with UCS preintegrated data center components and B200 M2 blades
- Unified storage for FC traffic (EMC VNX5500) for boot-over-SAN capabilities
- Simulation with in-house workload for studying scalability and performance for Self Service and Payroll Batch Processing
- Demonstration of Unix to Linux migration of PeopleSoft

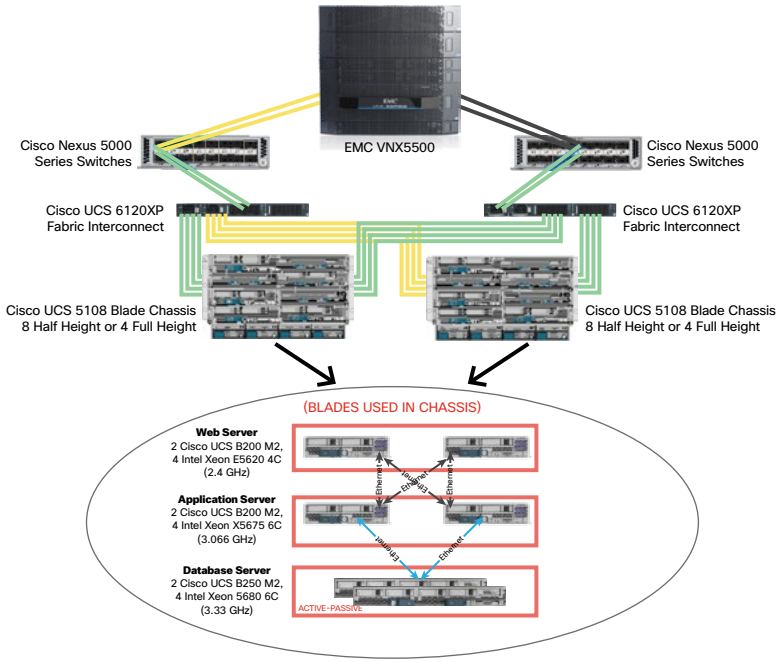
BUSINESS CHALLENGES

- Largest HRMS ERP Application that has multiple Tiers of Technology with inbuilt clustering and failover features
- Specific time periods generates heavy workload changes and hence high demand on quick H/W expansion flexibilities
- Caters to a large audience (typically entire Organization) that demand fast response times and high throughput
- Migration strategy for PeopleSoft from Unix to Linux

SUMMARY

- UCS Systems under test were stressed to show the optimum utilization of the architecture under peak loads for scalability, resiliency and performance
- UCS “Service Profile” helps faster flexible deployments in short notice and hence reduce license cost by introducing spare servers instead of standby servers
- VNX 5500 storage from EMC was provisioned and LUNS carved to provide optimal IOPS for PeopleSoft application

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_oracle_psft.html

Oracle 12c RAC on Cisco UCS and EMC VNX 8000

TECHNICAL HIGHLIGHTS

- Cisco UCS 2.1(1f) with Oracle UEK Kernel 6.3 and EMC VNX 8000
- Boot-over-SAN capabilities with Oracle RAC 12c
- Performance validation of a 8 node RAC on B420-M3 with EMC RAID and mixed pools, flash and SAS drives
- Validation of key Oracle 12c new features like flex ASM and pluggable databases
- Performance and destructive tests at 250k IOPS, 10GB/sec and around 1 million TPM

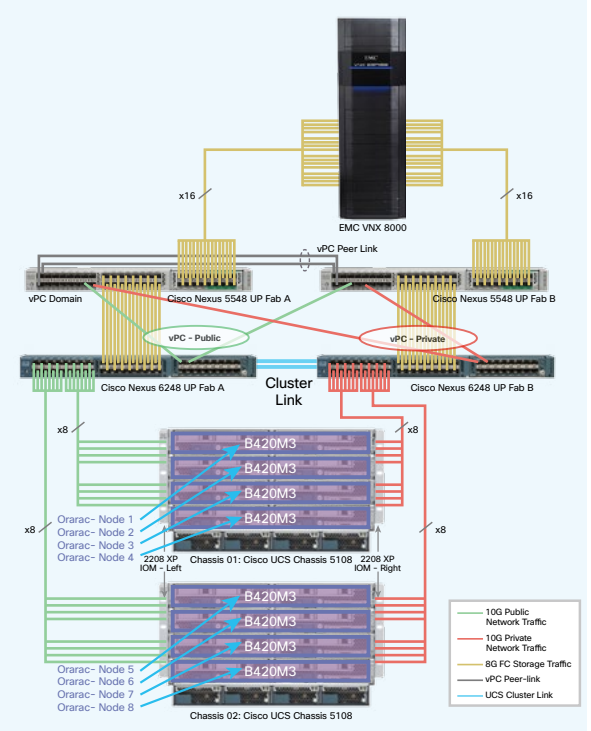
BUSINESS CHALLENGES

- Provides installation steps to customers looking to prototype and run Oracle 12c RAC on Cisco UCS servers
- Provides installation and best practices for customers looking for Oracle RAC deployment details on full width Cisco UCS blades like B420-M3 and with block devices like EMC-VNX
- Best practices for heavy workloads on Cisco UCS blades

SUMMARY

- Integration of compute & storage solution
- Oracle 12c RAC best practices on Cisco UCS blades with EMC VNX and PowerPath with boot-over SAN capabilities
- Oracle 12c pluggable databases overview and migration

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_emc_oracle12cR1.pdf

Applications

MICROSOFT

VMware

- Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod
- FlexPod with Microsoft Exchange 2013 on Cisco ACI

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

Microsoft Sharepoint 2013 with vSphere 5.5 and Cisco ACI on FlexPod

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct fabric Interconnect attached C-series
- Direct attached storage for FCoE Boot support
- vSphere 5.1 virtualization platform
- Microsoft SharePoint 2013

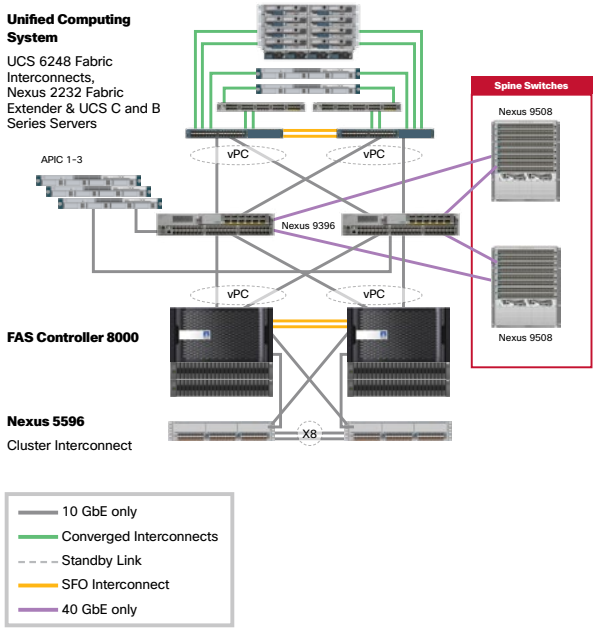
BUSINESS CHALLENGES

- Scalability and performance issues
- Challenges in business adjacency due to growing enterprises and complexity in managing them
- Time consuming, convoluted, expensive application deployment
- Isolated network regulation
- Inefficient orchestration and cumbersome network automation
- Complex multi-tenant environment

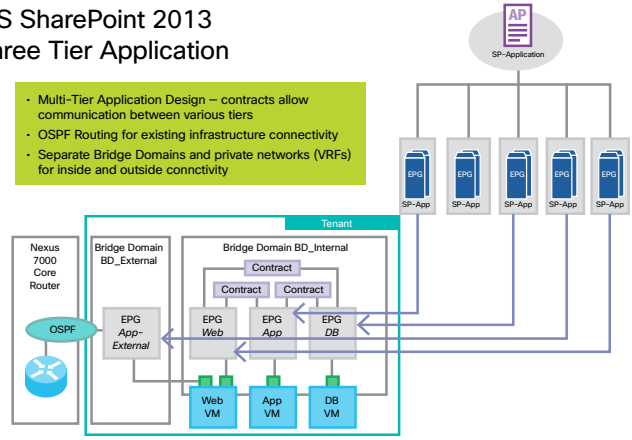
SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Consistent network policies throughout the data center with enhanced automation capability
- Rapid SharePoint application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE



MS SharePoint 2013
Three Tier Application



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/sharepoint2013_aci_flexpod_vmware_deploy.pdf
Design: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/sharepoint2013_aci_flexpod_vmware.pdf

FlexPod with Microsoft Exchange 2013 on Cisco ACI

TECHNICAL HIGHLIGHTS

- Nexus 9000 supporting ACI
- Policy driven network configuration
- NetApp FAS 8000 with cluster Data ONTAP 8.2.1
- UCS 2.2 (1d) supporting direct fabric interconnect attached C-series
- vSphere 5.5 virtualization platform
- Microsoft Exchange 2013

BUSINESS CHALLENGES

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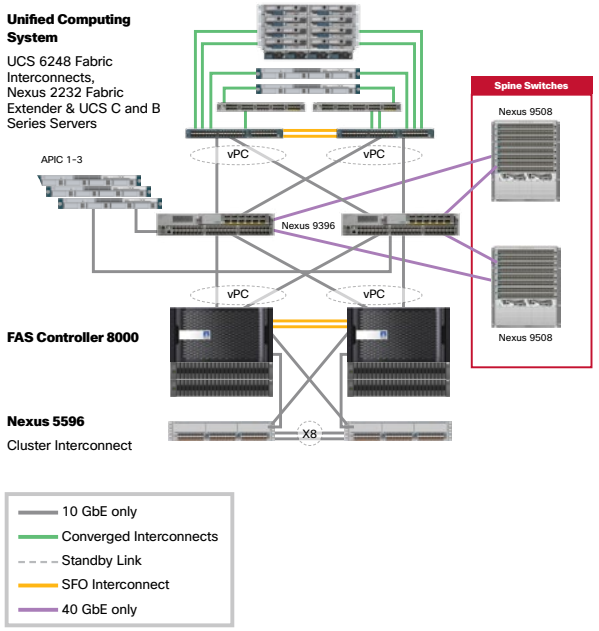
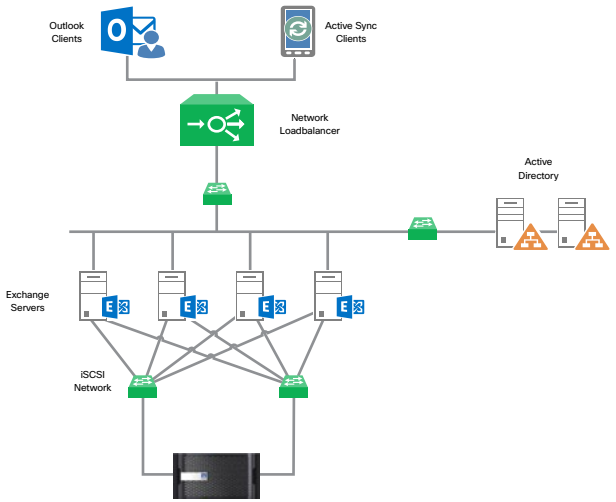
- Rapid exchange application deployment
- Joint publication with Cisco-NetApp
- High-performance, scalable and resilient system

ARCHITECTURE





CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/exchange2013_aci_flexpod_vmware.html
Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/exchange2013_aci_flexpod_vmware_design.html

Applications

MICROSOFT

Microsoft

- Microsoft SharePoint 2010 with Microsoft Hyper-V on Cisco UCS Rack-Mount Servers

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

Microsoft SharePoint 2010 with Microsoft Hyper-V on Cisco UCS Rack-Mount Servers

TECHNICAL HIGHLIGHTS

- Highly available SharePoint farm solution
- (High availability at Application level)
- Rack server C240 – local storage
- End-to-end 20 G network
- Qos policy and virtual port channeling
- Monitoring and provisioning through power shell scripts
- Tiered storage and cost effective solution

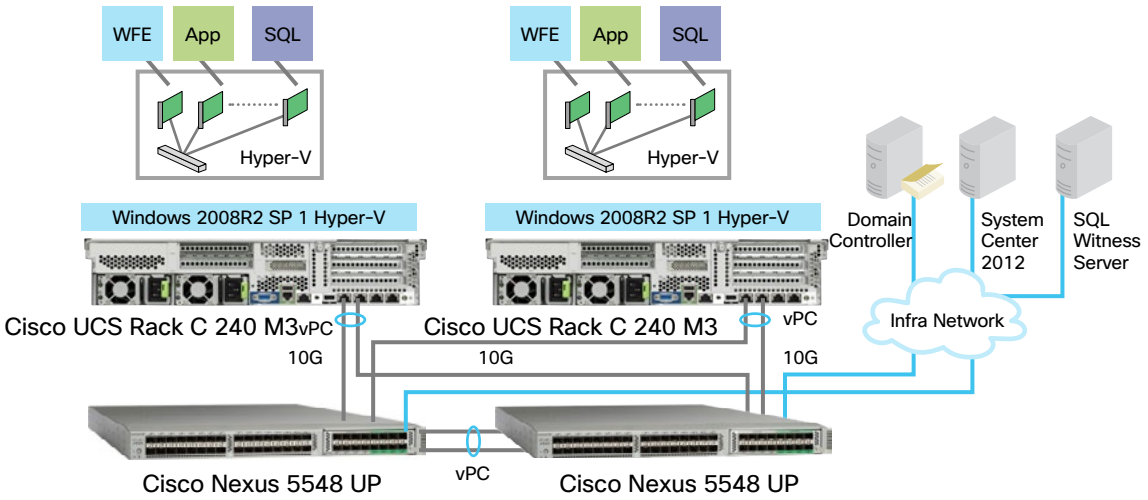
BUSINESS CHALLENGES

- Small and medium-sized businesses quickly deploy the tools they need to lower total cost of ownership (TCO), reduce complexity, and improve operation efficiency
- Reliable, highly available infrastructure helps ensure continuous access to Microsoft SharePoint

SUMMARY

- The solution integrates all the components necessary to quickly deploy a range of solution sizes to meet the needs of businesses. It consists of Cisco UCS C240 M3 and C240 M3 rack servers. The solution provides a highly scalable and reliable platform for variety of virtualized workloads
- The solution enables small and medium businesses to take advantages of the power if server consolidation without the complexity entailed in designing and implementing custom solutions

ARCHITECTURE



CVD: http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/mshv_shpt10_ucsrack.html

Applications

SAP

- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series
- FlashStack for SAP HANA TD
- Cisco UCS Integrated Infrastructure for SAP HANA
- Cisco UCS Integrated Infrastructure Solutions for SAP Applications with EMC Storage
- FlexPod Datacenter for SAP Solution with Cisco ACI
- FlexPod Datacenter for SAP HANA with Nexus 9000

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series

TECHNICAL HIGHLIGHTS

- UCS 6300 Fabric Interconnect, Nexus 9000, and NetApp AFF-A300 providing 40 GE end-to-end IP connectivity
- NetApp All Flash FAS (AFF) A300 with clustered data ONTAP 9.2 delivering ISCSI and NFS storage and 40 GE connectivity
- New FlexPod data center best practices for VMware vSphere 6.5 for virtualized implementations

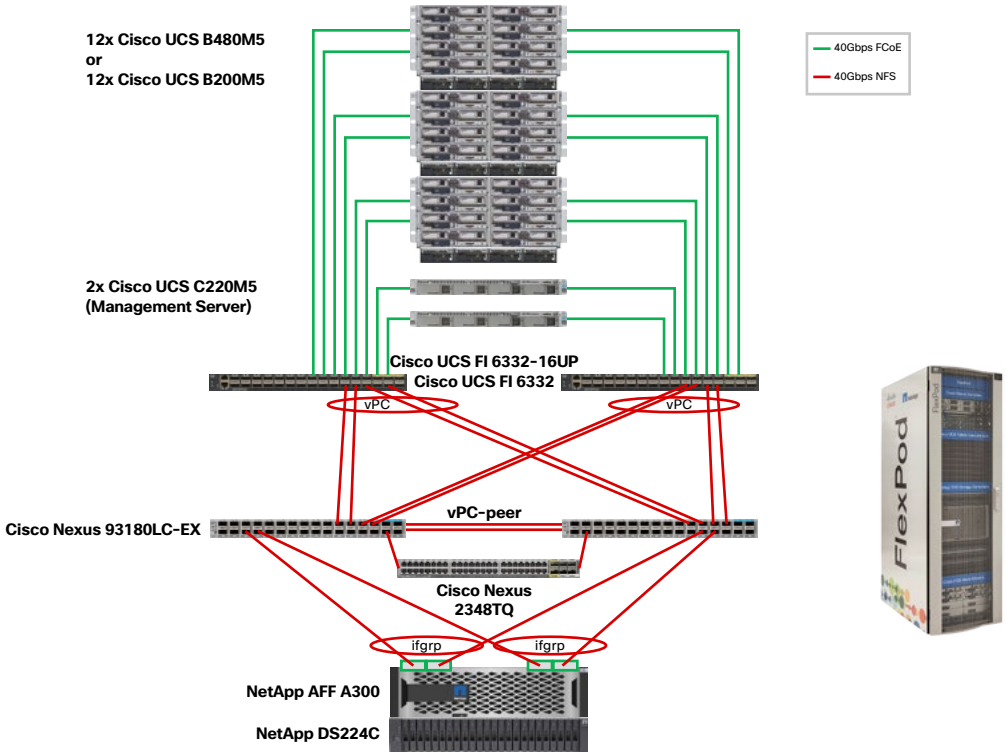
BUSINESS CHALLENGES

- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

SUMMARY

- Converged infrastructure for the NextGen data center
- Investment protection in high density and high performance data center environments. Nexus switches used are leaf node supported; easing shift to ACI mode
- High performance, scalable and resilient systems

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_n9k_aff_ucsm.html

FlashStack for SAP HANA TDI

TECHNICAL HIGHLIGHTS

- Seamless scalability of performance and capacity meeting required KPIs for SAP HANA TDI deployments; also ensuring high availability without performance compromise through in-place software and hardware upgrades
- Details the reference architecture for SAP HANA TDI implementation leveraging existing Cisco UCS infrastructure and Pure Storage
- Sample SAP HANA scale-up and 3+1 scale-out system deployment best practices

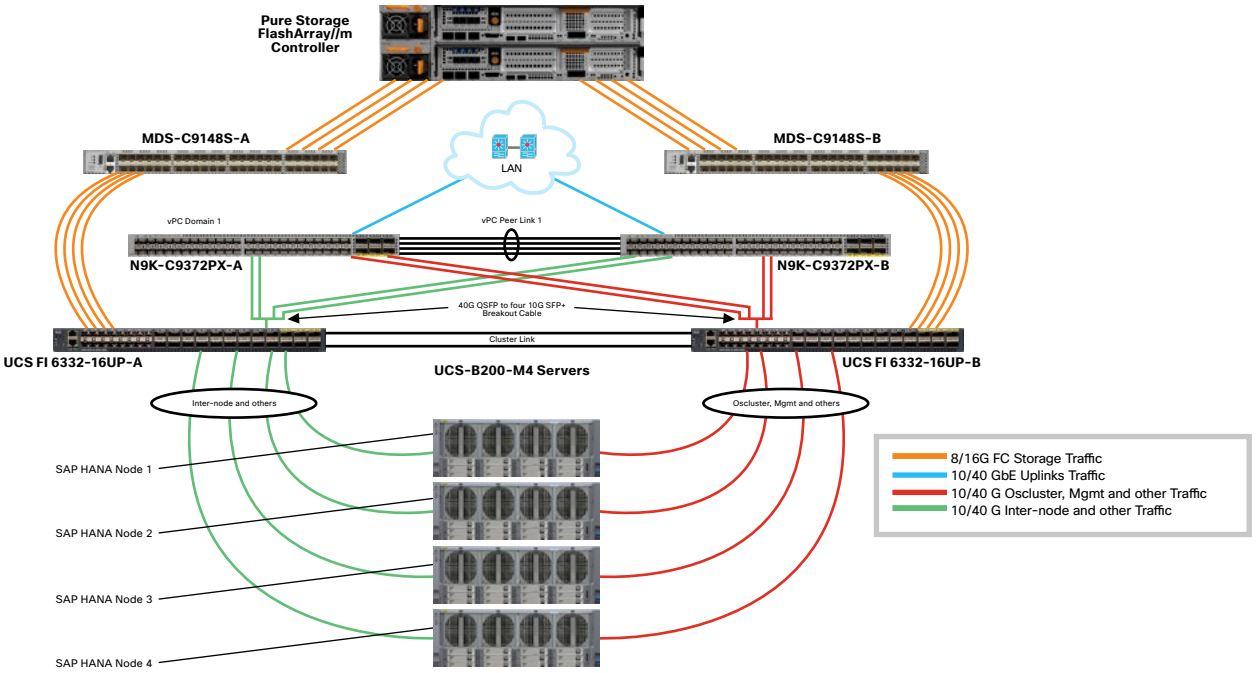
BUSINESS CHALLENGES

- SAP HANA TDI deployments are complicated and generally mission critical with high availability requirements. Customers face challenges maintaining these landscapes both in terms of time, available resources and operational cost
- Availability of pre-tested, scalable and best-in-class converged solution stack for optimizing enterprise workloads running SAP HANA database-based applications

SUMMARY

- A single platform built from unified compute, fabric and storage technologies, allowing you to scale to large-scale implementations without architectural changes
- Leverage a secure, integrated, and optimized converged stack that is pre-sized, configurable and deployable in a flexible manner for SAP HANA implementations.

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_saptdi.html

Cisco UCS Integrated Infrastructure for SAP HANA

TECHNICAL HIGHLIGHTS

- Solution is designed with next gen Cisco UCS fabric interconnect with 40Gb end-to-end network
- Persistent storage is configured on UCS C240 C-series servers with MapR Converged Data Platform
- MapR Data Platform provides distributed, reliable, high performance, scalable, and full read/write NFS-based storage for SAP HANA

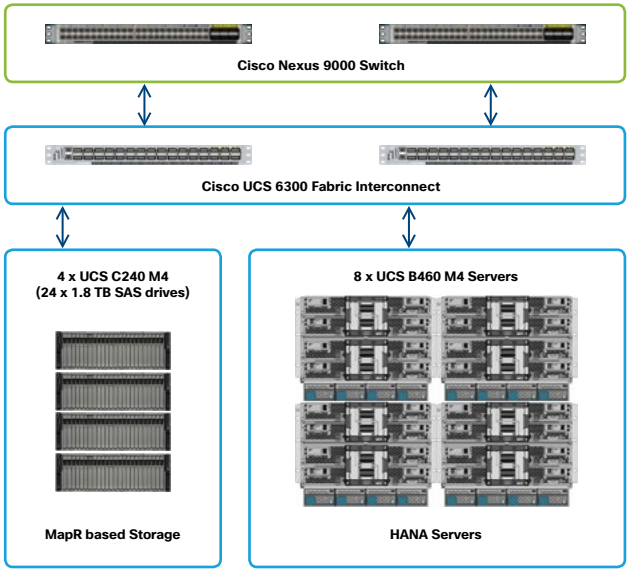
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for compute, network and storage
- Cisco's integrated infrastructure with policy-driven programmable infrastructure enables customers to better fit SAP applications into their data center
- Provide a reliable, flexible and scalable reference design with Cisco only hardware

SUMMARY

- Rapid provisioning of SAP HANA using UCS Service Profile with 40Gb end-to-end network including Storage Network. Single management endpoint for compute and storage elements for SAP HANA
- Cisco UCS servers provides persistent storage with MapR Converged Data Platform, a modern NFS-mountable distributed file-system with enterprise grade storage
- UCS integrated infrastructure provides policy-based models to deliver operational simplicity, comprehensive and consistent performance to run SAP HANA

ARCHITECTURE



CVD with RHEL 6.7: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_mapr.html
CVD with SLES: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_sles.html
CVD with RHEL 7: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_rhel.html

Cisco UCS Integrated Infrastructure Solutions for SAP Applications with EMC Storage

TECHNICAL HIGHLIGHTS

- Scalable architecture with new Cisco Nexus 9000 series switches in standalone mode
- Implementation of mixed HANA use case. Scale-Up with BareMetal and Virtualization Option, Scale-Out for BareMetal and Suites on HANA
- Scalable Unified storage for Fibre Channel and NFS traffic. EMC VNX Series
- Supports multiple OS Red Hat Enterprise Linux, SUSE Linux Enterprise Server

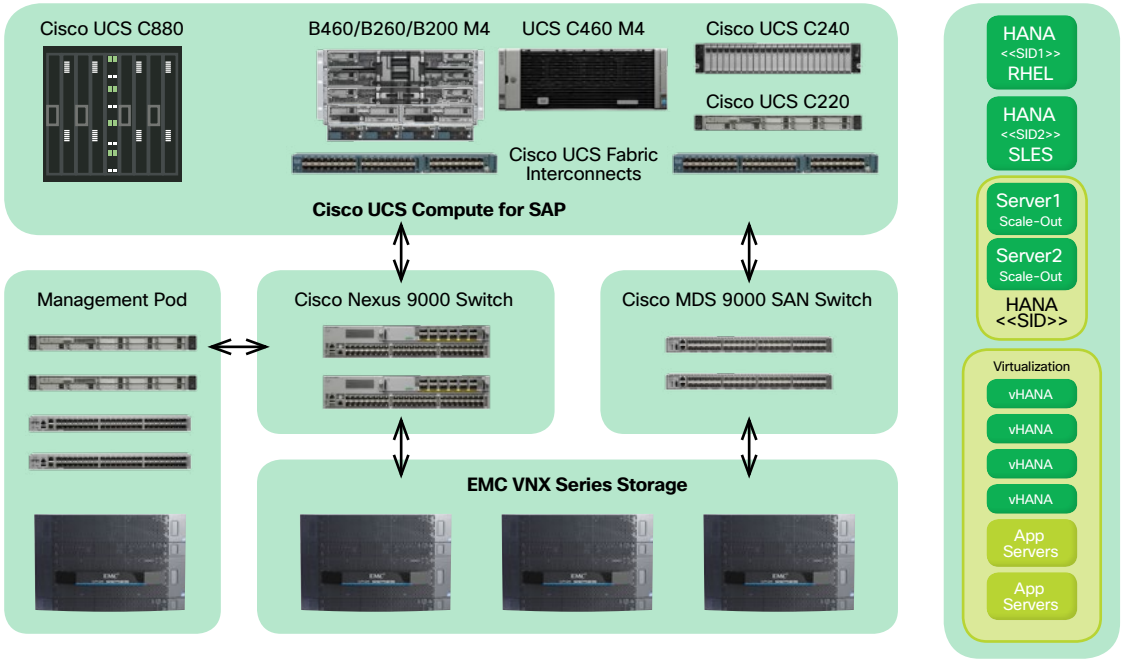
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for Cloud solutions
- Provides architecture for SAP HANA solution efficiently virtualizing various compute option from Cisco UCS servers for varied customer use cases
- Provide a reliable, flexible and scalable reference design

SUMMARY

- Integration of compute, network and storage solution
- Rapid provisioning of SAP HANA using UCS Service Profile, Storage clone using EMC Snapshot
- Scalable EMC VNX series storages
- Integration of vSphere 5.5 for virtualized HANA support
- Multiple HANA instances on shared infrastructure, and application server connecting to HANA DB

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/emc_saphana_n9k.html

FlexPod Datacenter for SAP Solution with Cisco ACI

TECHNICAL HIGHLIGHTS

- Unifying point of automation and management for Cisco ACI Fabric using Cisco Application Policy Infrastructure Controller (Cisco APIC)
- Implementation of mixed HANA use case. Scale-Up with BareMetal and Virtualization Option, Scale-Out for BareMetal and Suites on HANA
- Scalable Unified storage for iSCSI and NFS traffic. NetApp FAS 8000 Series
- Supports multiple OS Red Hat Enterprise Linux 6.6, SUSE Linux Enterprise Server 11 SP 3

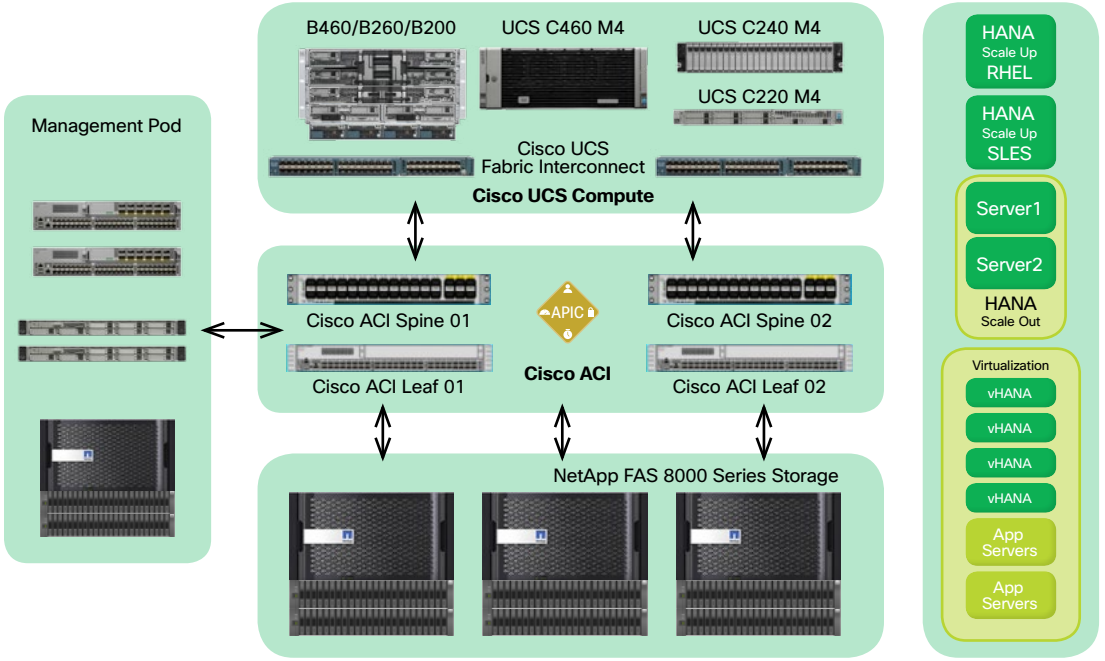
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for Cloud solutions
- Provides architecture for SAP HANA solution efficiently virtualizing various compute option from Cisco UCS servers, Cisco ACI Policy driven Network for varied customer use cases
- Provide a reliable, flexible and scalable reference design

SUMMARY

- Rapid provisioning of SAP HANA using UCS Service Profile, ACI Policy based Network, Storage clone using NetApp Flexclone
- Cisco APIC optimizes the application lifecycle for scale and performance, and supports flexible application provisioning across physical and virtual resources
- Integration of compute, network and storage solution with vSphere 5.5 for virtualized HANA support
- Multiple HANA instances on shared infrastructure, and application server connecting to HANA DB

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_ACI.html

FlexPod Datacenter for SAP HANA with Nexus 9000

TECHNICAL HIGHLIGHTS

- Scalable architecture with new Cisco Nexus 9000 series switches in standalone mode
- Implementation of mixed HANA use case scale-up with physical server and virtualization option, scale-out for physical server and suites on HANA
- Scalable unified storage for iSCSI and NFS traffic. NetApp FAS 8000 series
- Supports mulitple OS Red Hat Enterprise Linux 6.5, SUSE Linux Enterprise server 11 SP 3

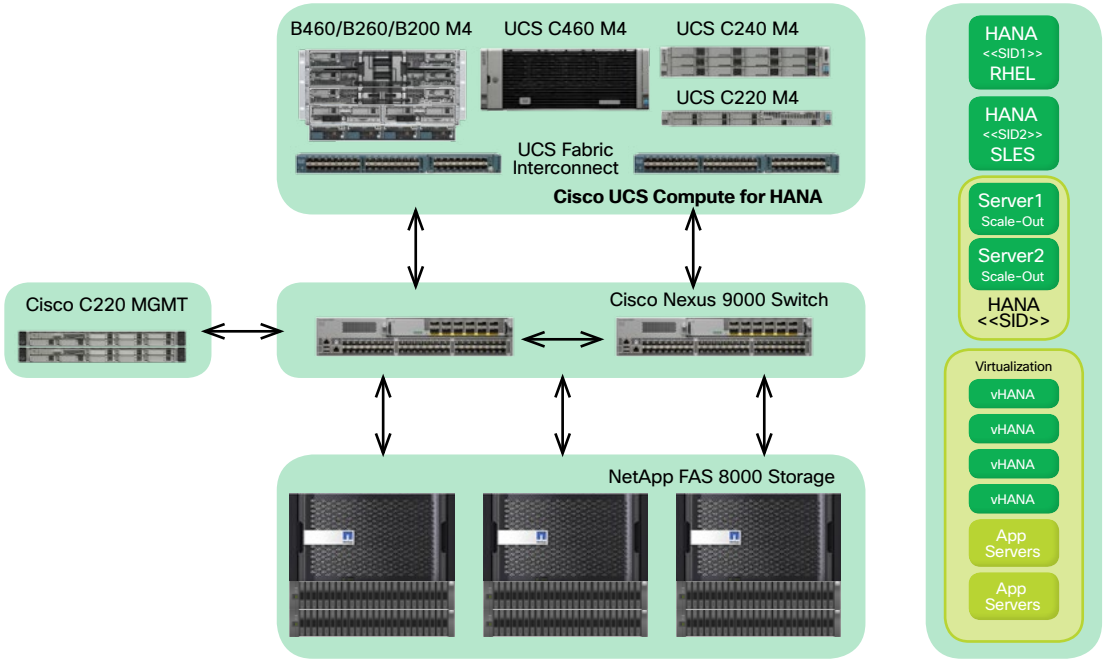
BUSINESS CHALLENGES

- Provide an end-to-end implementation of SAP HANA utilizing the capabilities of the unified infrastructure for cloud solutions
- Provides architecture for SAP HANA solution efficiently virtualizing various compute option from Cisco UCS servers for varied customer use cases
- Provide a reliable, flexible and scalable reference design

SUMMARY

- Integration of compute, network and storage solution
- Rapid provisioning of SAP HANA using UCS Service profile, storage clone using NetApp Flexclone
- Scalable NetApp storage using cluster Data ONTAP, using dedicated cluster switch
- Integration of vSphere 5.5 for virtualized HANA support
- Multiple HANA instances on shared infrastructure, with an option to include application server connecting to HANA DB

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_saphana_n9k.pdf

Applications

VIRTUAL CLIENT COMPUTING

Citrix: VMware

- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users - ***New***
- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
- FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6
- 2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1
- 4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users

TECHNICAL HIGHLIGHTS

- 16 UCS HXAFC220-M4S rack servers, 8 UCS B200 M4 blade servers, 8 UCS C220 M4 rack servers (N+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.1.1b, UCSM 3.1(2g)
- Citrix XenDesktop 7.13
- Citrix Provisioning Services 7.13
- VMware vSphere 6.0 U3

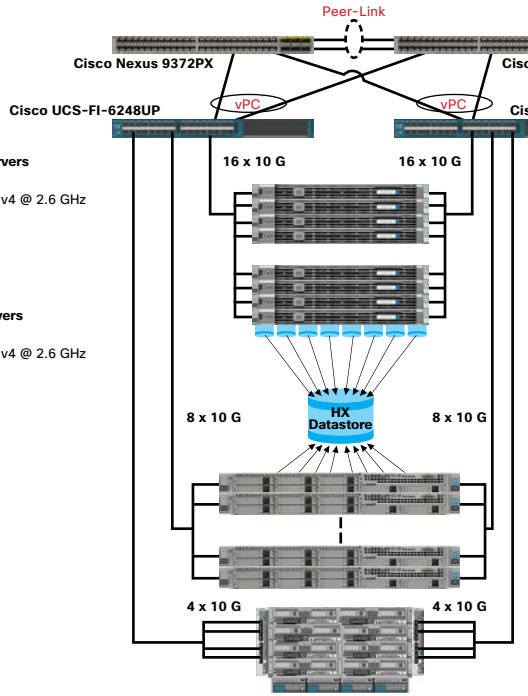
BUSINESS CHALLENGES

- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for Citrix XenDesktop 7.x tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE



8 x Cisco UCS C220 M4S Rack Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2680 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2680 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1340

16 x Cisco HXAF220C-M4S Rack Servers
Each server includes:
- 2 x Intel© Xeon© CPU E5-2690 v4 @ 2.6 GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured with drives per converged node
- 1 x 800GB Samsung Enterprise Performance (EP) SSD for Cache
- 10 x 960GB Samsung SATA Enterprise Value SSDs for capacity

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HXAF211b_4Kseat_XenDesk713.html

FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7

TECHNICAL HIGHLIGHTS

- UCS 3.1(1e)
- UCS B200 M4 blades
- NetApp AFF8080EX-A storage system
- NetApp clustered data ONTAP 8.3.2
- Nexus 9372 series switches (standalone)
- Citrix XenApp and XenDesktop (7.7)
- VMware vSphere 6.0 update 1a

BUSINESS CHALLENGES

- Quick provisioning of VCC solution environment
- Dynamic and agile expansion of VCC solution
- Scalability of VCC to support user demand at large scale
- Support for enterprise converged VCC solution

SUMMARY

- Day-zero workflow provisioning support
- Converged infrastructure based on Cisco Unified Data Center
- Mixed VCC and RDS workload scenarios
- CVD introduction to UCS Performance Manager
- Hardware/software level redundancy using Cisco UCS and NetApp Availability features

ARCHITECTURE

Workload

XenApp 7.7
XenDesktop 7.7

Network

2x Nexus 9372 Switches
2x Cisco UCS 6248 Fabric Interconnects

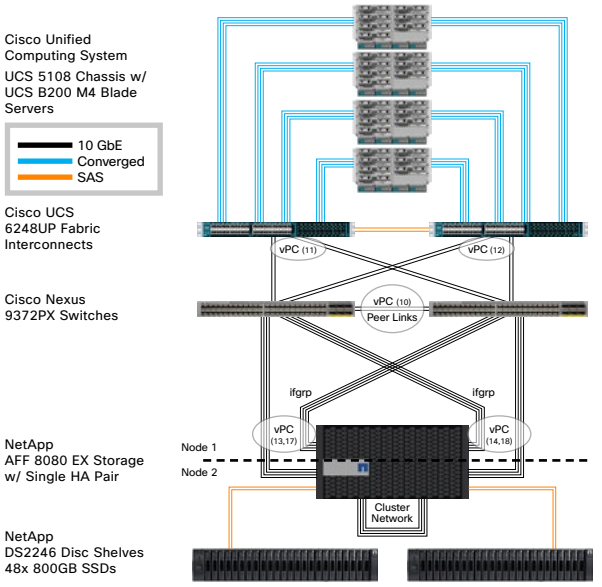
Compute

4x Cisco UCS 5108 Chassis
28x Cisco UCS B200 M4 Blade Server

Storage

NetApp AFF8080EX Storage28x 2x
NetApp DS2246 Disk Shelves 48x 800GB SSDs

FlexPod Datacenter with B200 M4 Blade Servers, AFF8080EX Storage, vSphere 6 U1, and Citrix XenApp/XenDesktop 7.7 for 5000 Seats



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd77esxi60u1_flexpod.html

FlexPod Express with Cisco UCS Mini and Citrix XenDesktop 7.6

TECHNICAL HIGHLIGHTS

- UCS 3.0(2c)
- UCS B200 M4 blades
- NetApp FAS2552 array
- NetApp Clustered Data ONTAP 8.3
- Nexus 9372 series switches (standalone)
- Citrix XenApp and XenDesktop (7.6)
- VMware vSphere 5.5 Update-2

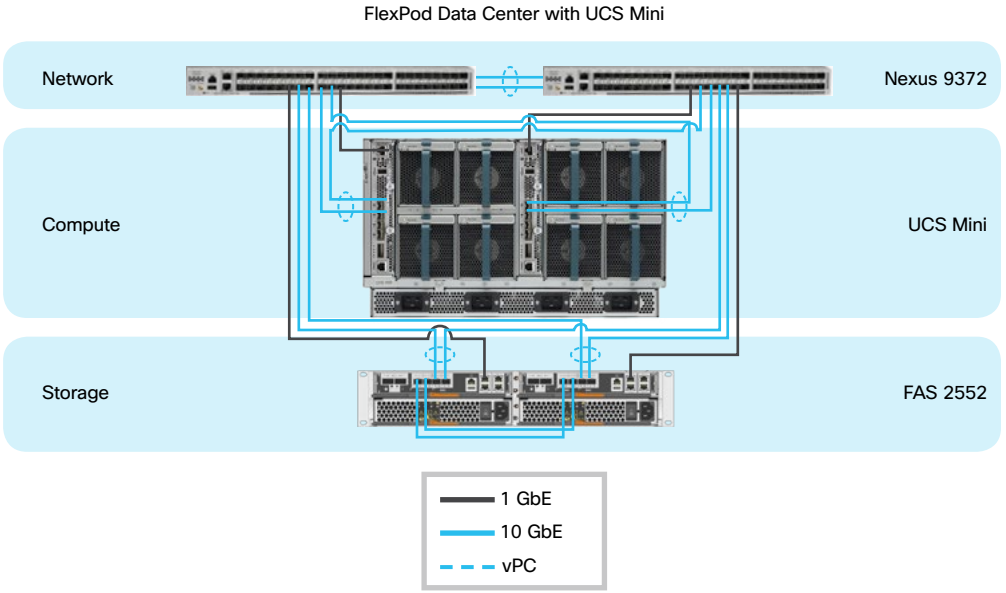
BUSINESS CHALLENGES

- Quick provisioning of VCC solution environment
- Dynamic and agile expansion of VCC solution
- Scalability of VCC to support user demand
- Support for ROBO, converged VCC solution

SUMMARY

- FlexPod Auto-Provisioning support
- Converged infrastructure based on Cisco Unified Data Center
- Mixed VCC and RDS workload scenarios
- Ultra user density with minimum rack space footprint
- Hardware Level Redundancy using Cisco UCS and NetApp Availability features

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd76esxi55u2_flexpod.html

2000 Seat FlexPod for Citrix XD 7.1 on vSphere 5.1

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.1 (3a)
- Cisco UCS B200 M3 with Intel E5-2680 v2
- Cisco 6248UP fabric interconnect, Nexus 5548UP Layer 2 Switch
- VMware vSphere 5.1
- Citrix XenDesktop 7.1 pooled HVD desktops and RDS hosted shared desktops
- Nexus 1000v for VMware v 4.2 (1) SV2 (2.1a)
- NetApp FAS 3240 Data ONTAP cluster mode

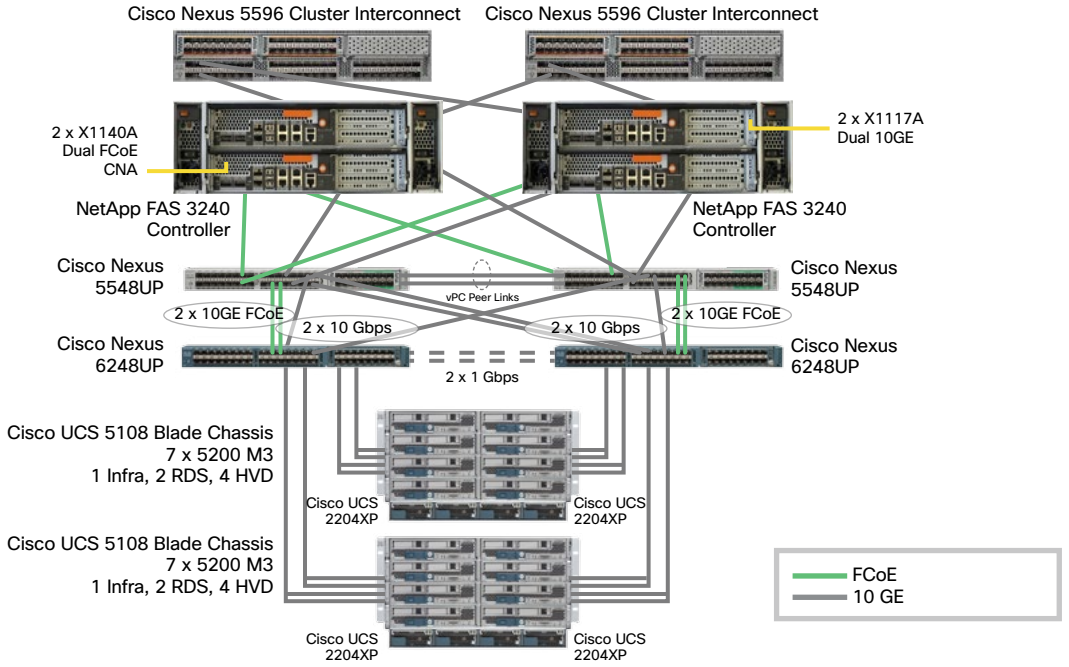
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Complex design and integration
- Scale challenges
- Differing user requirements
- Lack of end-user acceptance

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system
- Rapid boot, rapid login, and support for 2000 mixed-use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd7esxi51_flexpod.pdf

4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.1(1a)
- Cisco UCS B200 M3 with Intel E5-2690
- Cisco 6248UP fabric interconnect, Nexus 5548UP Layer 2 switch
- VMware vSphere 5.1
- Citrix – 5.6 pooled and personal vDisk, XenApp 6.5 hosted shared desktops
- Nexus 1000v for VMware v 4.2(1) SV1(5.2)
- EMC VNX7500 with fast cache

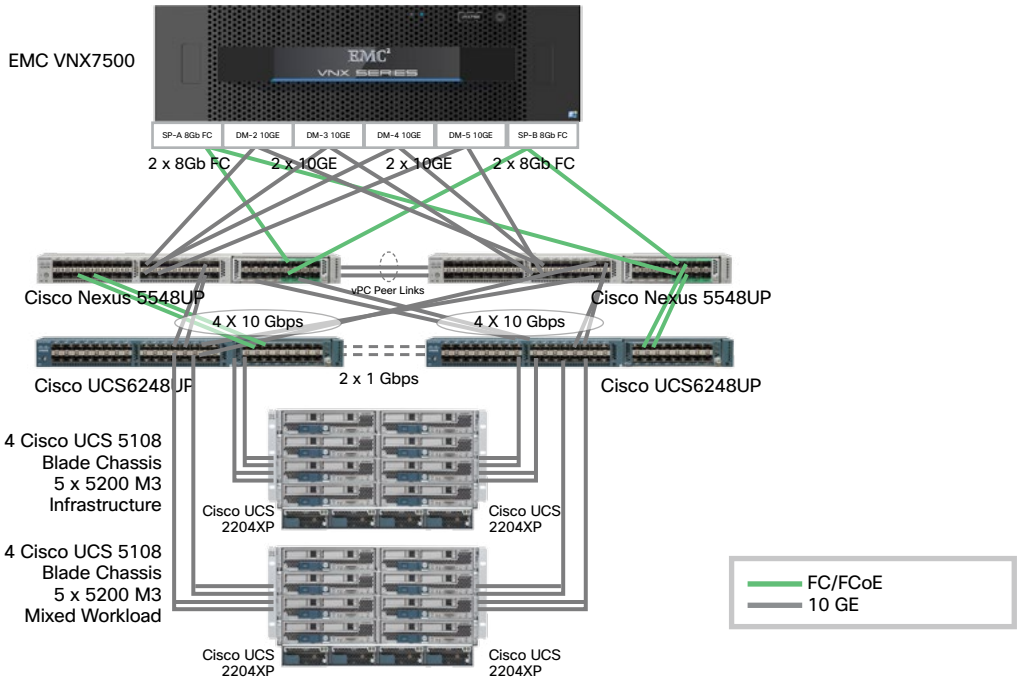
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Complex design and integration
- Scale challenge
- Differing user requirements
- Low end-user adoption

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, and resilient system
- Rapid boot, rapid login and support for 4000 mixed-use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/citrix_emc_ucs_XDXAscale.pdf

Applications

VIRTUAL CLIENT COMPUTING

Citrix: Citrix

- 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 – ***New***
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2
- 2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15

TECHNICAL HIGHLIGHTS

- Simple architecture with UCS B Series Servers
- High performance SAN for desktop workloads
- 1250 users per FlashStack Mini solution
- Performance study with simulations of typical desktop workloads

BUSINESS CHALLENGES

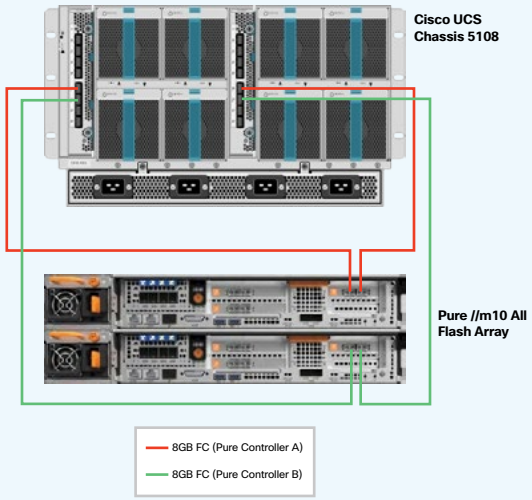
- Typical end-user virtualization workloads
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing VCC solutions

SUMMARY

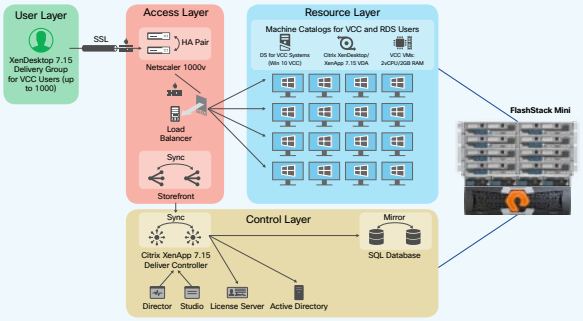
- High performance and scalability with simplicity
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Small footprint for SMB

ARCHITECTURE

Physical Architecture



Logical Architecture



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_citrixmshyperv_1250.html

5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2

TECHNICAL HIGHLIGHTS

- UCS 3.1(2b) with Broadwell support
- Cisco UCS Managed B 200 M4 (E5-2680v4) 28 servers, four clusters, N+1
- Nexus 9172PX 7.0(3)I2(2e), Nexus 1000V 5.2(1), 10 GE and FC switching
- VMware vSphere 6.0 update 2 Hypervisor
- Citrix XenDesktop, XenApp and PVS 7.9
- Pure Storage FlashArray//m50 84TB raw flash storage
- NVIDIA M6 graphics mezzanine card

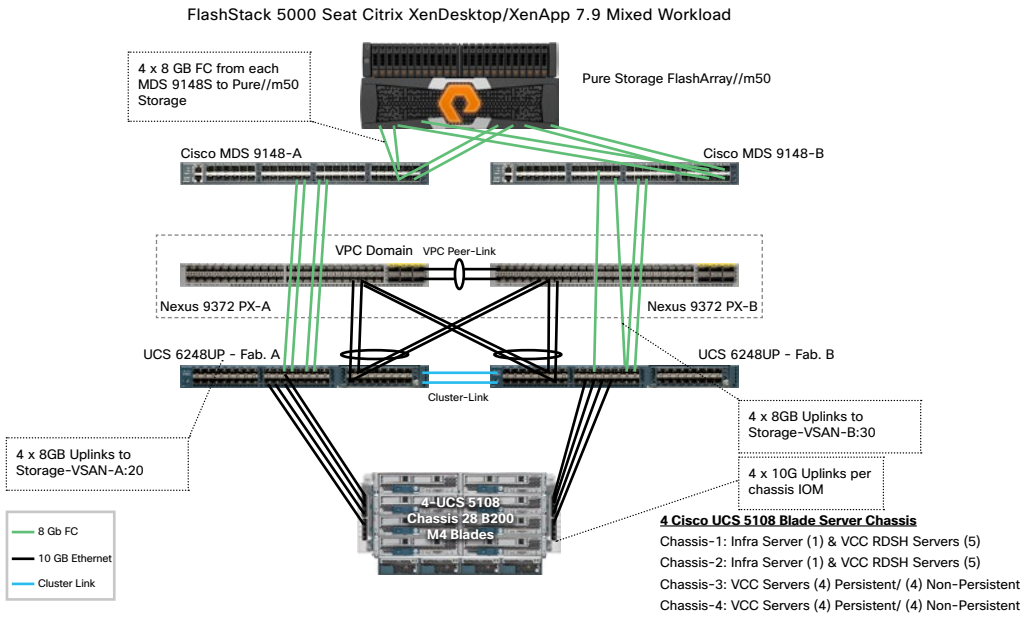
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Integration complexity
- Inefficient human resource utilization
- Complex, expensive operations
- Large scale deployment building blocks needed
- Requirement for outstanding end-user experience
- Graphics support
- Windows 10/Office 2016 transition

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center and FlashStack architecture
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment with rapid boot, excellent end user experience
- Mixed workload with pooled and persistent Windows 10 VCC and hosted shared server desktops
- Higher VM density per ESXi cluster
- Supported NVIDIA M6 graphics

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_XD79_5k.html

2000 Seat FlexPod for Citrix XD 7.1 HVD/RDS on XenServer 6.2

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.1(3a)
- Cisco UCS B200 M3 with Intel E5-2680 v2
- Cisco 6248UP fabric interconnect, Nexus 5548UP layer 2 switch
- Citrix XenServer 6.2
- Citrix XenDesktop 7.1 pooled HVD and RDS hosted shared desktops
- NetApp FAS 3250 Data ONTAP C-Mode
- NetApp FAS 3250 Data ONTAP C-Mode

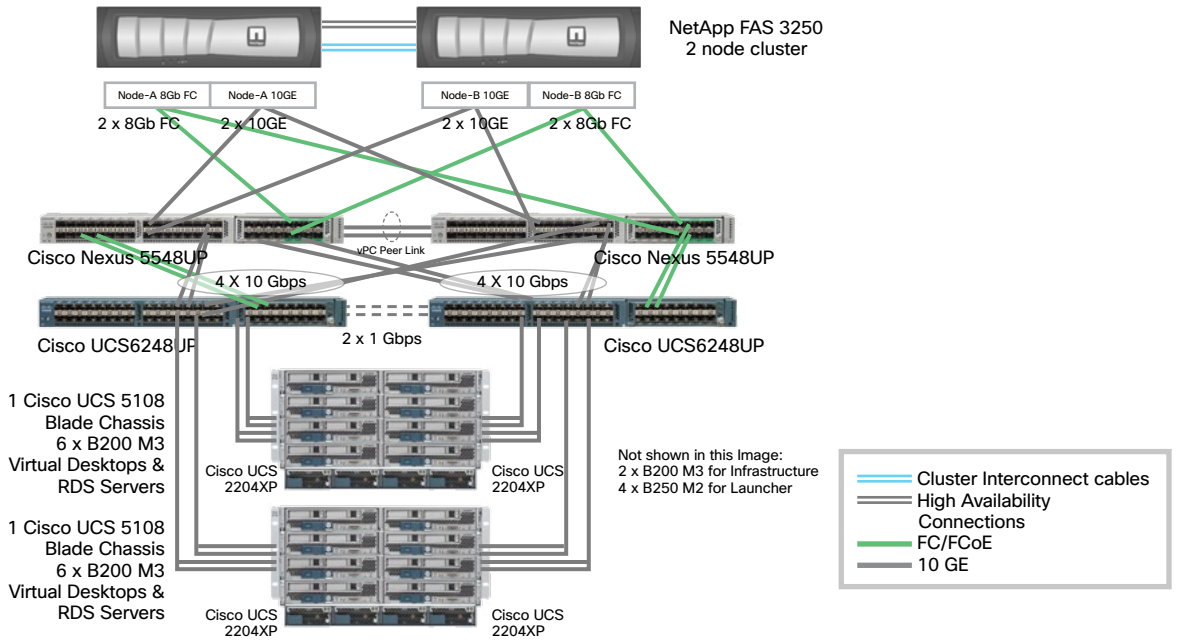
BUSINESS CHALLENGES

- Siloed network, compute, storage
- Complex design and integration
- Scale challenge
- Differing user requirements
- End user acceptance

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient system
- Rapid boot, rapid login and support for 2000 mixed use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_ucs_xd7esxi51_flexpod.pdf

Applications

VIRTUAL CLIENT COMPUTING

VMW View

- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users - ***New***
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users - ***New***
- Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users
- VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users
- 5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 16 UCS HXAFC220-M4S rack servers, 8 UCS B200 M4 blade servers and 8 UCS C220 M4 rack servers (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.1.1b, UCSM 3.1(2g)
- VMware Horizon 7.1
- VMware vSphere 6.0 U3

BUSINESS CHALLENGES

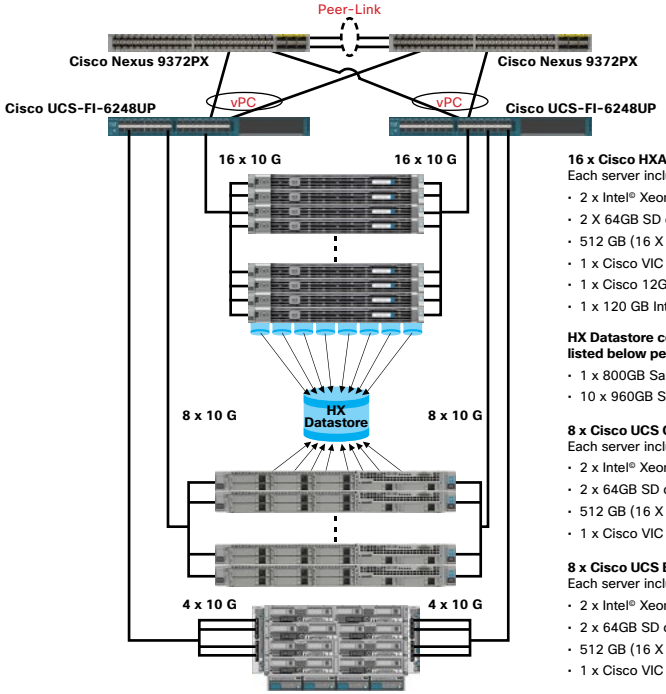
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



16 x Cisco HXAF220C-M4S Rack Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2690 v4 @ 2.6. GHz processor
- 2 X 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool with drives listed below per node:
- 1 x 800GB Samsung Enterprise Perfomance (EP) SSD for Cache
- 10 x 960GB Samsung SATA Enterprise Value SSDs for capacity

8 x Cisco UCS C220 M4S Rack Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2680 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 X 32GB DDR4) RAM
- 1 x Cisco VIC 1227

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel® Xeon® CPU E5-2680 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 X 32 GB DDR4) RAM
- 1 x Cisco VIC 1340

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HXAF211b_4Kseat_Horizon71.html

Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 4 UCS HXAFC220-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1a, UCSM 3.2(2b)
- VMware Horizon 7.3.1
- VMware vSphere 6.5 U1

BUSINESS CHALLENGES

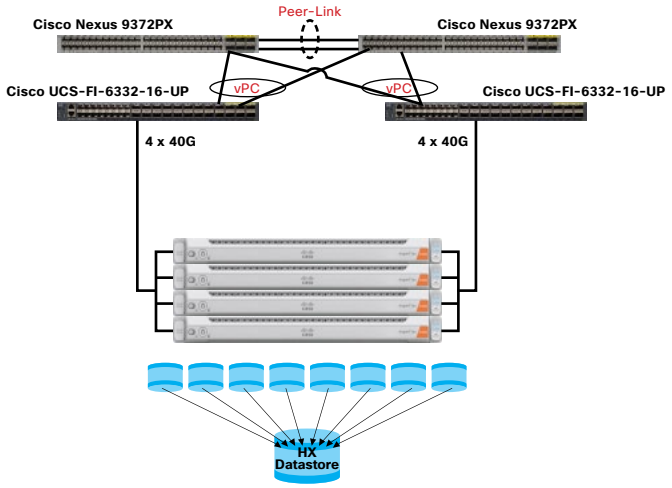
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco HyperFlex All-Flash system for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



4 x Cisco HXAF220C-M5S Rack Servers
Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 240GB M.2 SATA SSD
- 768 GB (12 X 64GB DDR4) RAM
- 1 x Cisco VIC 1387 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 240 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool or Server 2016 RDS Pool with drives listed below per node:

- 1 x 400GB Toshiba Enterprise Performance (EP) SSD for Cache
- 8 x 960GB Samsung SATA Enterprise Value SSDs for capacity

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hx26_vdi_600seat_horizon.html

Cisco HyperFlex Hyperconverged System with up to 2400 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 8 UCS HXC240-M4SX rack servers and 8 UCS B200 M4 blade server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 1.8.1c, UCSM 3.1(2b)
- VMware Horizon 7
- VMware vSphere 6.0

BUSINESS CHALLENGES

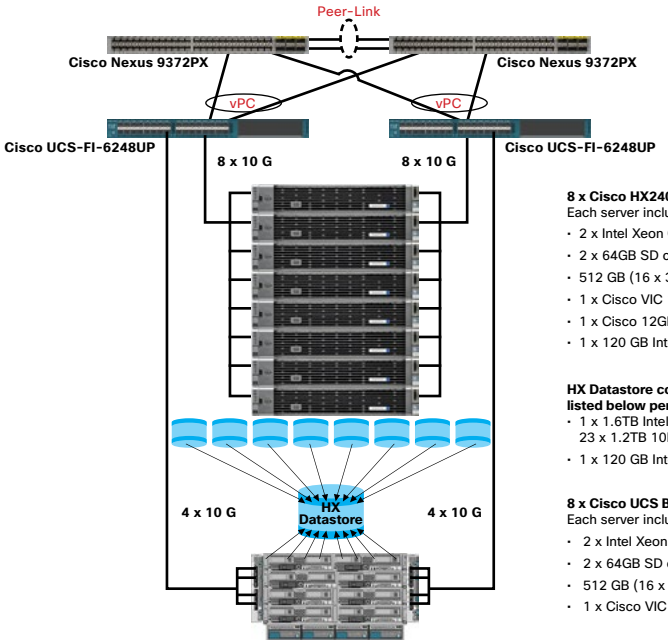
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless data center integration and management, and energy efficiency
- Enterprise-grade virtual client computing solution with excellent end user experience
- Best practices for installation and deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability

SUMMARY

- HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Reference Architecture



8 x Cisco HX240C-M4S Rack Servers
Each server includes:
- 2 x Intel Xeon CPU E5-2690 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 x 32GB DDR4) RAM
- 1 x Cisco VIC 1227 mLOM
- 1 x Cisco 12Gbps Modular SAS HBA
- 1 x 120 GB Intel SATA Enterprise Value SSD

HX Datastore configured to host Windows 10 desktop pool with drives listed below per node:
- 1 x 1.6TB Intel SATA Enterprise Value SSD for Cache
  23 x 1.2TB 10K RPM SAS HDDs for capacity
- 1 x 120 GB Intel SATA Enterprise Value SSD

8 x Cisco UCS B200 M4 Blade Servers
Each server includes:
- 2 x Intel Xeon CPU E5-2690 v4 @ 2.6 GHz processor
- 2 x 64GB SD card
- 512 GB (16 x 32GB DDR4) RAM
- 1 x Cisco VIC 1340

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/HX18_VDI_2000seat_horizon.html

VersaStack with Cisco UCS and IBM FlashSystem A9000 Storage for 5000 VMware Horizon Users

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M4 chassis
- 5,000 mixed RDSH and VCC users combined and infrastructure servers in four 5108 blade server chassis
- 5000 combined RDS-hosted server sessions and VCC users, Cisco hardware, FIs, Nexus switches, IBM A9000 FlashSystem Storage in 42 RU single rack solution
- Performance study with simulations of RDS-hosted server sessions and VCC typical desktop workloads running knowledge worker workload

BUSINESS CHALLENGES

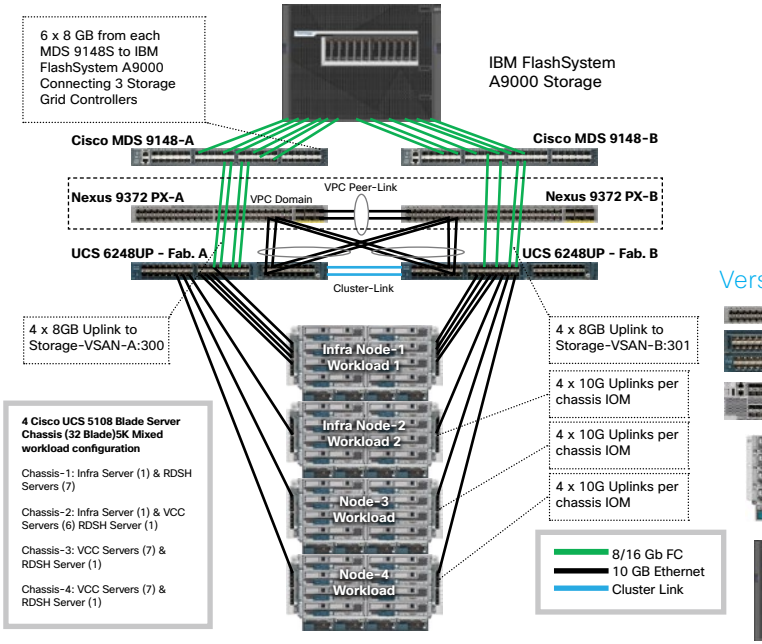
- Typical VMware Horizon tops and RDS-hosted server sessions mixed workload combined users
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing RDSH and VCC solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Very good end-user experience measuring <1 second for both RDSH and VCC users on cluster level and 5000 users mixed workload level
- IBM modular storage technology. Storage controller failure with 3 active grid controllers technology. No business disruption resilient capability

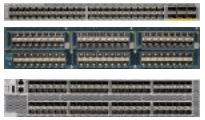
ARCHITECTURE

Physical Architecture



VersaStack – A single rack solution for 5000 (RDSH & VCC) Mixed Users

VersaStack Components



Fabric
2 Cisco Nexus 9372PX Switches
2 Cisco UCS 6248UP Fabric Interconnects
2 Cisco MDS 9148S 16Gb Fibre Channel / Switches

Compute
1 Cisco UCS 5108 Blade Chassis
2 Cisco UCS 2208 IO Modules
Up to 8 Cisco UCS B200 M4 Blade Servers

Storage:
1 IBM FlashSystem A9000
12 x1.2 TB MicroLatency Modules (21.44 TB Raw capacity)

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_horizon7_flasha9k_5k.html

5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M4 Chassis
- 5,000 mixed RDSH and VCC users combined and infrastructure servers in four 5108 blade server chassis
- Nearly 1250 combined RDS-hosted server sessions and VCC users in 2 RU data center foot print
- Performance study with simulations of RDS-hosted server sessions and VCC typical desktop workloads
- Local resources replace SAN for workload files

BUSINESS CHALLENGES

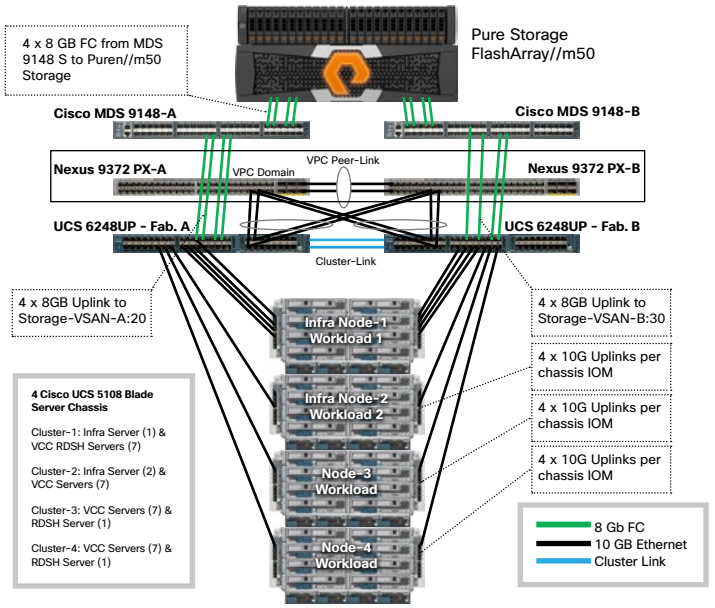
- Typical VMware Horizon View Desktops and RDS-hosted server sessions mixed workload combined users
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing VCC and RDSH solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Very good end user experience measuring <1 second for both VCC and RDSH users on cluster level and 5000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability

ARCHITECTURE

Physical Architecture



FlashStack Components

Network

2 Cisco 9372 PX Network Switches

2 Cisco 9148 S MDS Switches

Compute

4 Cisco 5108 Blade Server Chassis
2 Cisco B200 M4 Blade Servers For Infrastructure
30 Cisco B200 M4 Blade Servers For Workload

Storage

Pure FlashArray//m50
1 Base disck 40TB raw space
1 external disk shelf with 44TB raw space
(Total 88TB disk space)

CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_view62_5k.html

Applications

VIRTUAL CLIENT COMPUTING

Desktop-As-A-Service (DaaS)

- 2000 Seat Desktop-as-a-Service for Service Provider Virtual Client Computing (VCC) with Citrix
- Cisco Desktop-as-a-Service Solution with Desktone

Enterprises today feel an urgency to respond to fast-changing market and economic conditions by consolidating, rationalizing, and transforming their mission-critical business applications in a way that supports growth.

2000 Seat Desktop-as-a-Service (DaaS) for Service Provider Virtual Client Computing (VCC) with Citrix

TECHNICAL HIGHLIGHTS

- Cisco UCS Manager 2.2(2c)
- Cisco UCS B200 M3 with Intel E5-2680 v2
- Cisco 6248UP fabric interconnect, Nexus 5548UP Layer 2 switch
- VMware ESXi 5.5
- Citrix XenDesktop 7.5 pooled SVDI and RDS hosted shared desktops
- EMC VNX5600

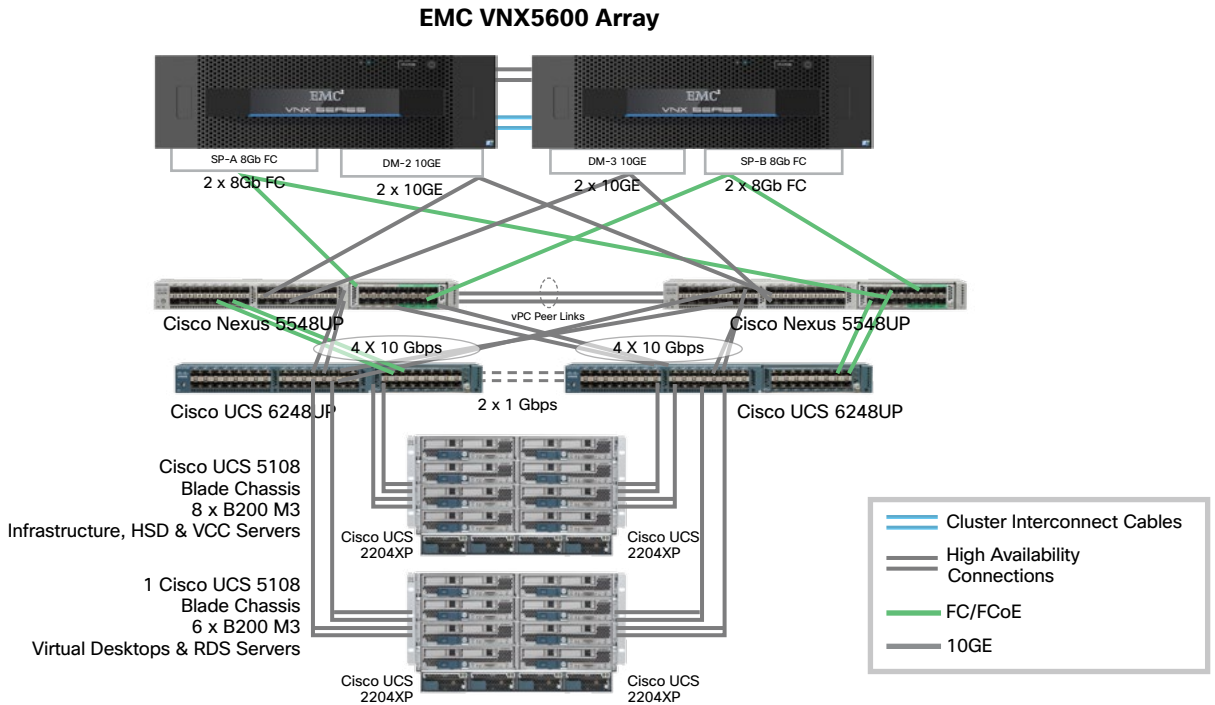
BUSINESS CHALLENGES

- Siloed network, compute, storage
- Complex design and integration
- Scale challenge
- Differing user requirements
- End-user acceptance

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High performance, scalable and resilient system
- Rapid boot, rapid login and support for 2000 mixed use case virtual desktops and session users

ARCHITECTURE



CVD: http://www.cisco.com/c/dam/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_cvds_spdaas_ucs_2k.pdf

Cisco Desktop-as-a-Service (DaaS) Solution with Desktone

TECHNICAL HIGHLIGHTS

- UCS 2.1(1a)
- Cisco UCS B200M3
- Nexus 5000 supporting low latency, 10 GE & 40 GE switching
- Cisco Catalyst 6506 with ASA-SM
- Cisco ASR 9006
- VMware vSphere 5.1
- Desktone v5.3.2
- iSCSI/FC/NFS storage array to support IO requirement

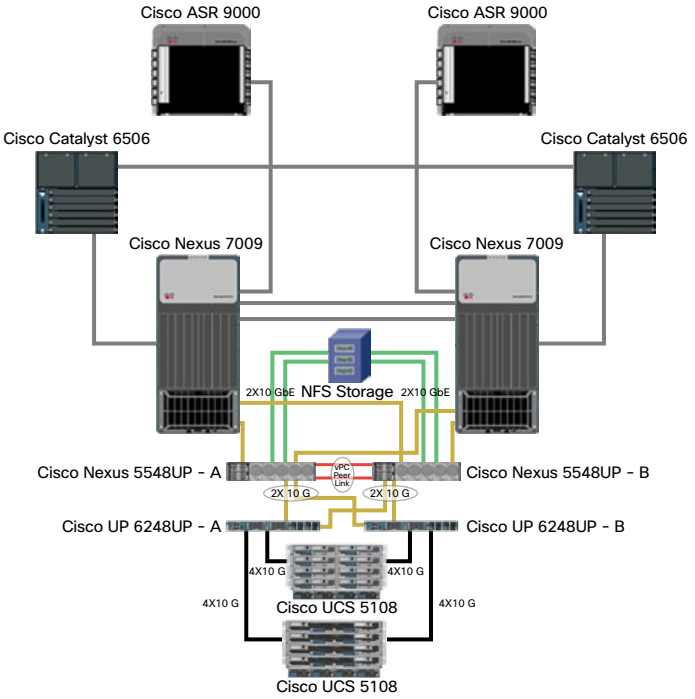
BUSINESS CHALLENGES

- Siloed network, compute, and storage
- Inefficient resource utilization
- Slow, complex, and expensive operations
- Application restraints
- Poor energy efficiency

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high-density and high-performance data center environments
- High-performance, scalable, flexible and secure multi-tenant and resilient desktop as a service solution for service provider

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/desktone_ss.html

Emerging Technologies

- Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management – ***New***
- Cisco UCS Infrastructure with Docker Datacenter for Container Management
- FlexPod Datacenter with Docker Datacenter for Container Management

The global cloud computing market is predicted to grow to $411.4 billion by 2020, up from just $37.8 billion in 2010, according to Gartner. Source: Gartner (October 2017)

Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management

TECHNICAL HIGHLIGHTS

- CNM-based Contiv network plugin integrated with Docker Enterprise Edition
- Native fabric visibility with L2 VLAN forwarding mode
- Multi-tenancy and data path segregation for application container/microservices I/O with Contiv
- High performance with near line rate networking for application containers
- Infrastructure automation with UCS Manager built-in capabilities
- Docker EE with Contiv provisioning through Ansible for scale-out architecture

BUSINESS CHALLENGES

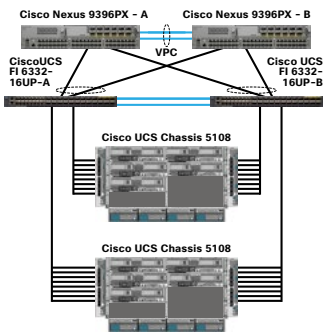
- Application portability across dev/test and production environments
- Agile business application deployment workflow and turnaround time
- Optimal infrastructural resource utilization at scale
- Policy-based infrastructure management including networking application containers and microservices
- Security, isolation and multi-tenancy

SUMMARY

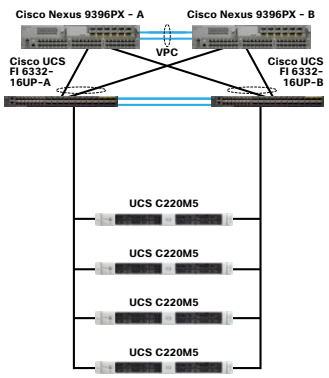
- Simple, efficient and scalable solution for any converged/integrated stack
- Cisco UCS infrastructure optimizes security, availability, performance and scale
- Docker Enterprise Edition provides a single management control plane from runtime to container lifecycle management
- Cisco UCS provides the converged computing, network, and storage platform needed to run the entire Docker Enterprise Edition
- Contiv provides security for application containers through policy-based rich network features, built-in service discovery and service routing
- Open APIs driven infrastructure provisioning through automation

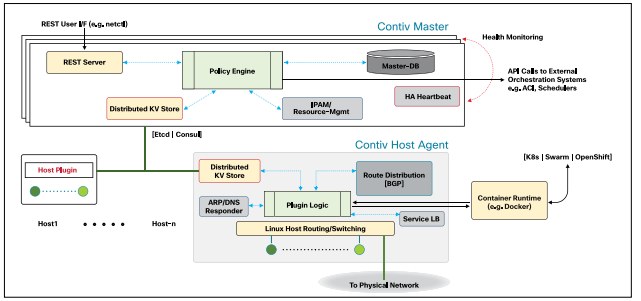
ARCHITECTURE

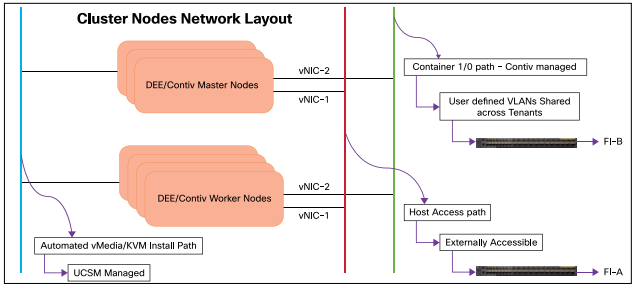
Topology 1 – With Cisco B-Series Servers



Topology 2 – With Cisco C-Series Servers







CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_contiv_docker.html

Cisco UCS Infrastructure with Docker Datacenter for Container Management

TECHNICAL HIGHLIGHTS

- Policy-driven and programmable infrastructure for ease of deployment and management
- Microservices and cloud-native application architecture enabling stateless application container deployment
- Continuous integration and continuous deployment(CI/CD) enabling developers to develop and test applications rapidly at scale
- DevOps model breaks down barriers between development and operations teams to improve delivery of applications

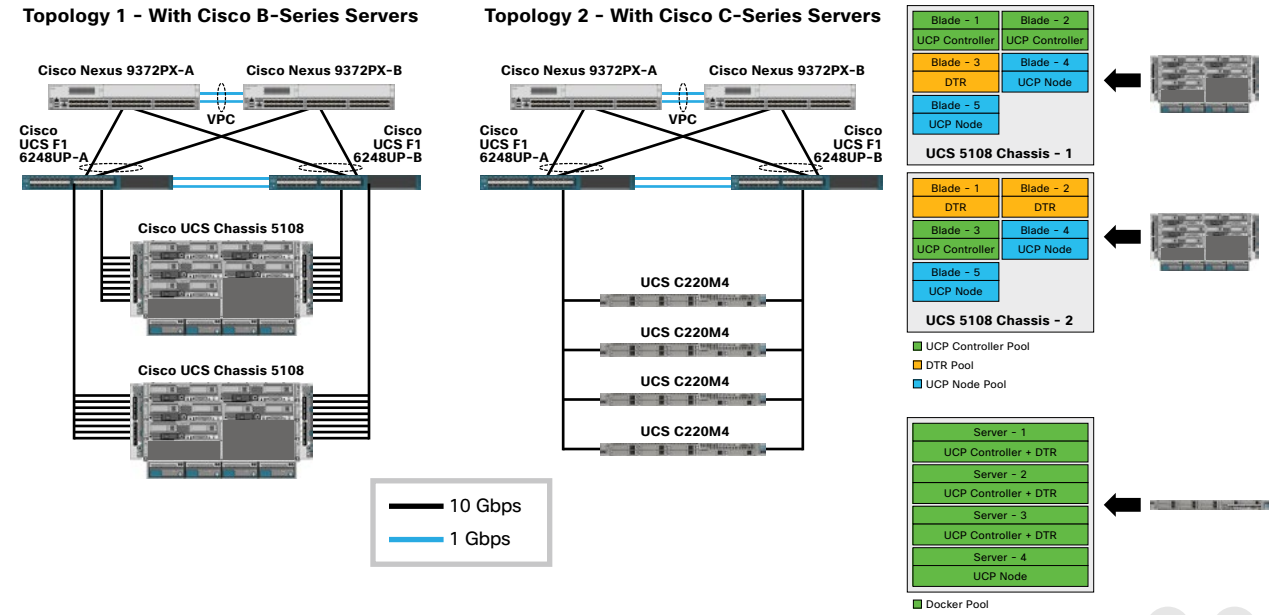
BUSINESS CHALLENGES

- Application portability across dev/test and production deployment
- Agile business application deployment workflow and turnaround time
- Optimal infrastructural resource utilization
- Policy-based management
- Security and isolation

SUMMARY

- Simple, efficient and scalable solution for any converged/integrated stack
- Cisco UCS infrastructure optimizes security, availability, performance and scale
- Docker Datacenter provides a single management control plane from runtime to container lifecycle management
- Cisco UCS provides the converged computing, network, and storage platform needed to run the entire Docker Datacenter
- Open APIs driven infrastructure provisioning through automation

ARCHITECTURE



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_docker.html

FlexPod Datacenter with Docker Datacenter for Container Management

TECHNICAL HIGHLIGHTS

- UCS 3.1(2f)
- B200M4 Blade Servers
- NetApp AFF 8040 with ONTAP 9.0
- NetApp Docker Volume Plugin 1.4
- Nexus 9000 series switch
- Red Hat Enterprise Linux 7.3
- Docker Engine 17.03.1-ee-3
- Docker Universal Control Plane (UCP) 2.1.2
- Docker Trusted Registry (DTR) 2.2.3

BUSINESS CHALLENGES

- Converged infrastructure platform for Docker
- Trusted and supported Docker Datacenter platform from industry leaders
- Scale up or out without disruption
- Slow, complex, risky, and expansive deployments and operations
- Inflexible infrastructure

SUMMARY

- Converged infrastructure based on Cisco Unified Data Center
- Investment protection in high density and high performance data center environments
- Highly available Enterprise Docker Datacenter on Red Hat Enterprise Linux distribution
- End-to-end hardware level redundancy using Cisco UCS and NetApp high availability features
- NetApp Docker Volume Plugin (nDVP) provides persistent NFS-based storage for containers

ARCHITECTURE

Unified Computing System

UCS 6248 Fabric Interconnects, UCS 2204 Fabric Extender and UCS B Series Servers

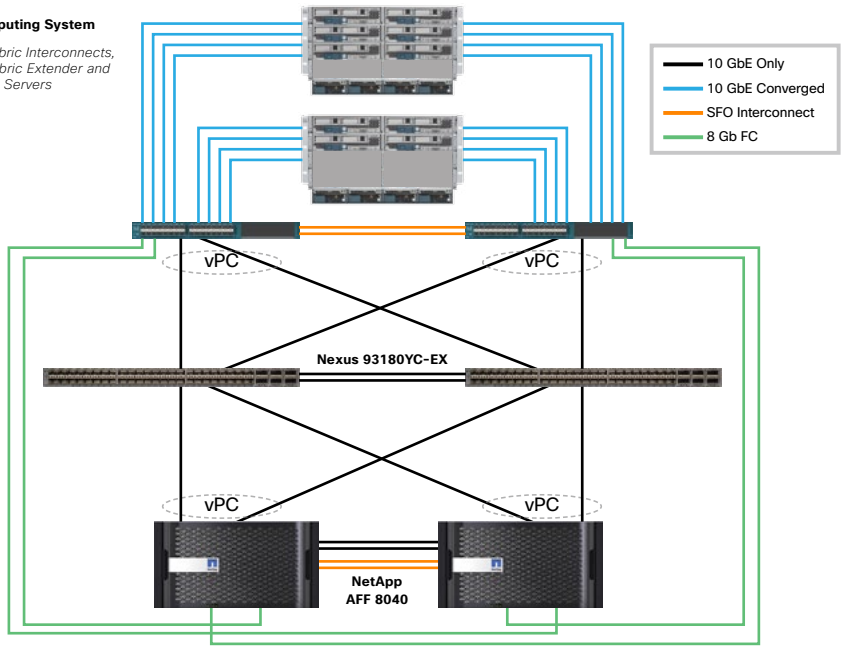
Cisco Unified Computing System

- 2x Cisco Nexus 5108 B-Series UCS Chassis
- 4x Cisco 2204XP Fabric Extenders
- 10 x B200 M4 Server(s)
- 2 x Cisco UCS 6248UP Fabric Interconnect

2 x Cisco Nexus 93180YC-EX

NetApp AFF8040

- 48 x 400 GB SSD (2 X Disk Shelves – DS2246)
- 24 x SSDs/Shelves



Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_docker_deploy_design.html

Information page

Additional Resources:

Design Zone: **www.cisco.com/go/cvd**

Data Center Design Zone: **www.cisco.com/go/dcdesignzone**

Virtual Client Computing (VCC) Design Zone: **www.cisco.com/go/vccdesigns**

Cisco Validated Designs (CVDs) support many Cisco Data Center and UCS Solutions. For more information on Cisco Solutions broader than CVDs, use the following URLs:

- **www.cisco.com/go/bigdata**
- **www.cisco.com/go/flexpod**
- **www.cisco.com/go/hyperflex**
- **www.cisco.com/go/microsoft**
- **www.cisco.com/go/oracle**
- **www.cisco.com/go/openstack**
- **www.cisco.com/go/sap**
- **www.cisco.com/go/vdi**
- **www.cisco.com/go/versastack**

For more information on UCS and UCS Solutions, use the following URL: **www.cisco.com/go/ucs**

Version:

Version 3.0 | February 2018

Viewing:

This playbook is best viewed in Adobe Reader Version XI (11.0.06).
If you do not have Adobe Reader, you can download it for free at **http://get.adobe.com/reader**

Thank you.