

DATA CENTER DESIGN PLAYBOOK

February 2019 | Version 5.0





Executive Summary

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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
\$1.44M

User Productivity
\$1M

IT Staff Productivity
\$1.37M

IT Infrastructure Cost Reduction
\$0.15M

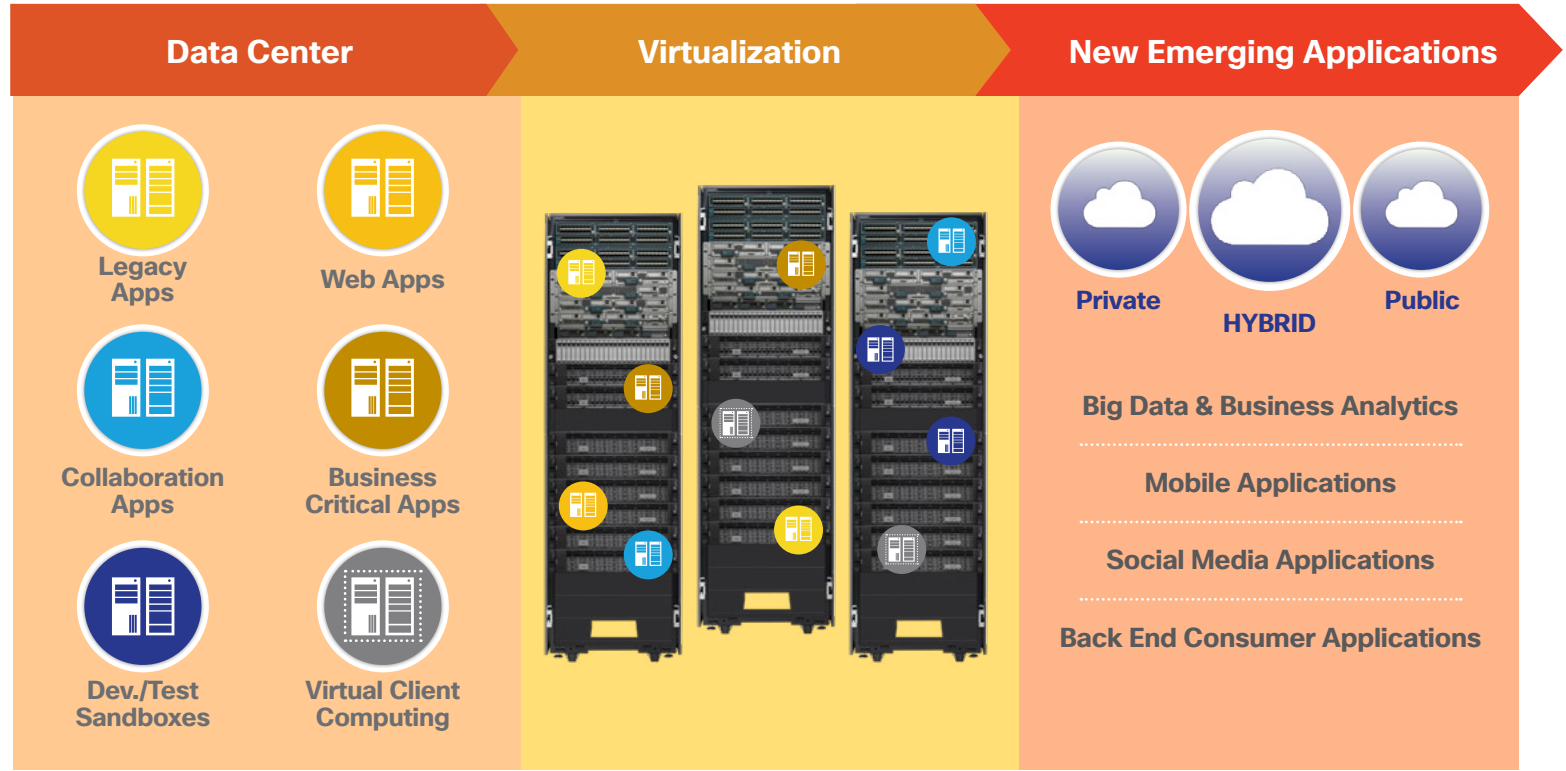
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Building Momentum: UCS Value Proposition

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 as 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.

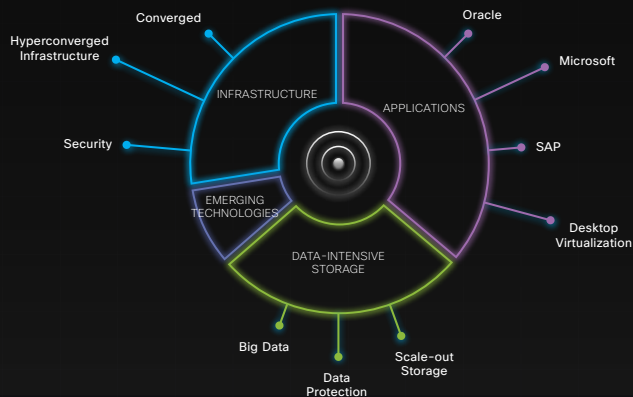




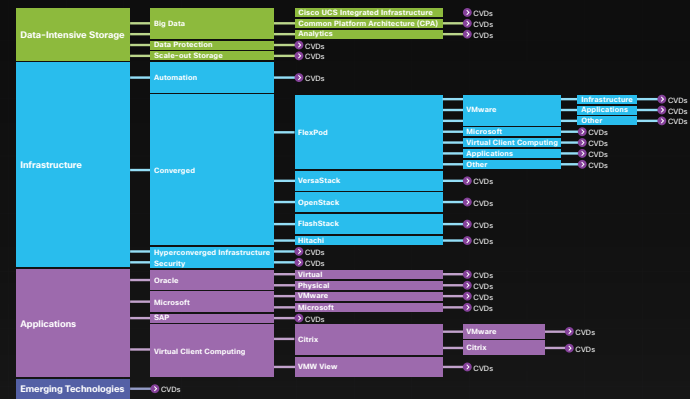
Let's Get Started

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 Integrated Infrastructure for Big Data and Analytics with MapR Data Platform - *New*
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Data Science at Scale
- 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 with IBM BigInsights for Apache Hadoop
- Cisco UCS Integrated Infrastructure with ACI with Cloudera
- Cisco UCS Integrated Infrastructure with Hortonworks
- Cisco UCS Integrated Infrastructure with MapR
- Cisco UCS Integrated Infrastructure with Splunk Enterprise

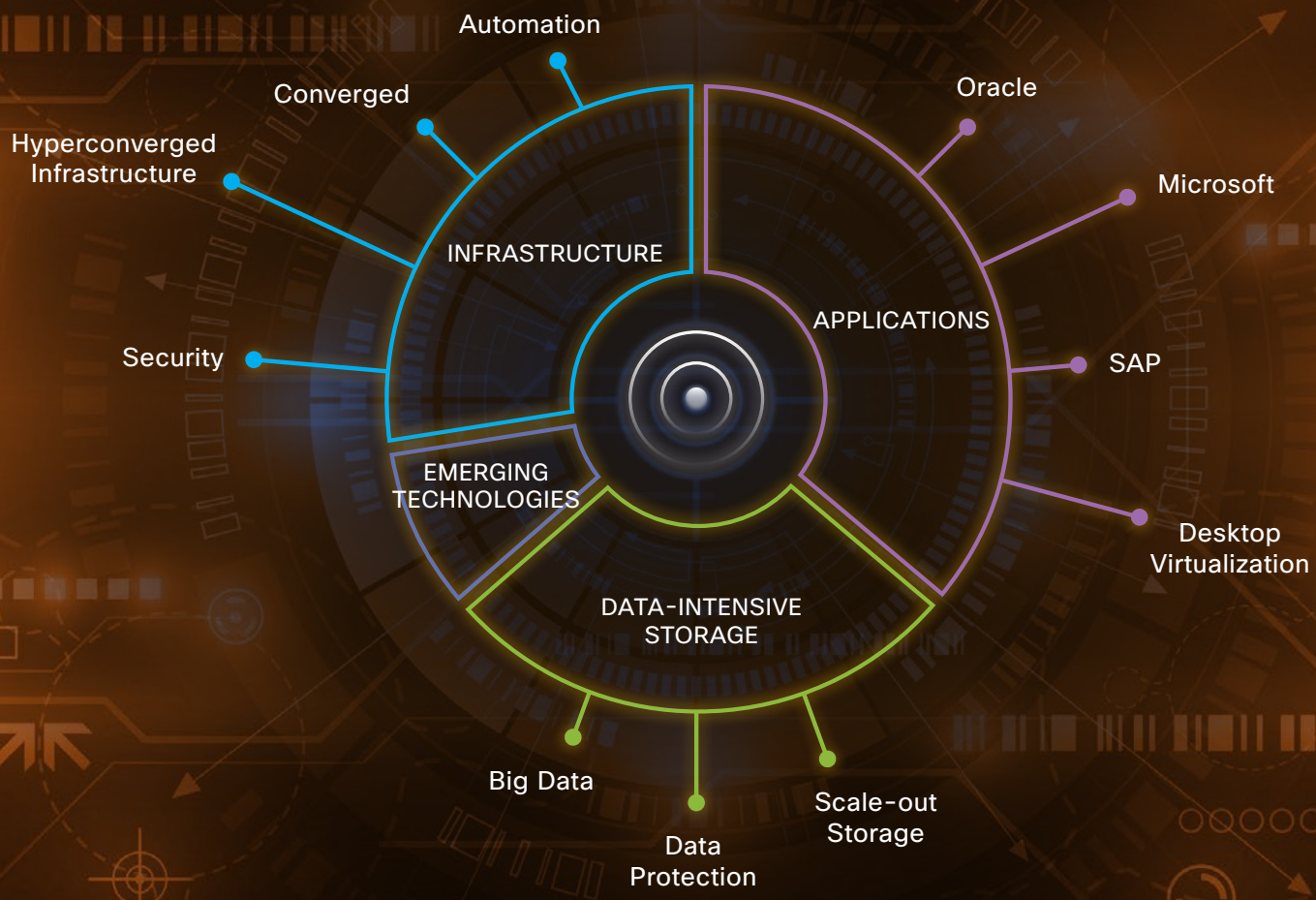
2. Common Platform Architecture (CPA)

- 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

Alphabetical View

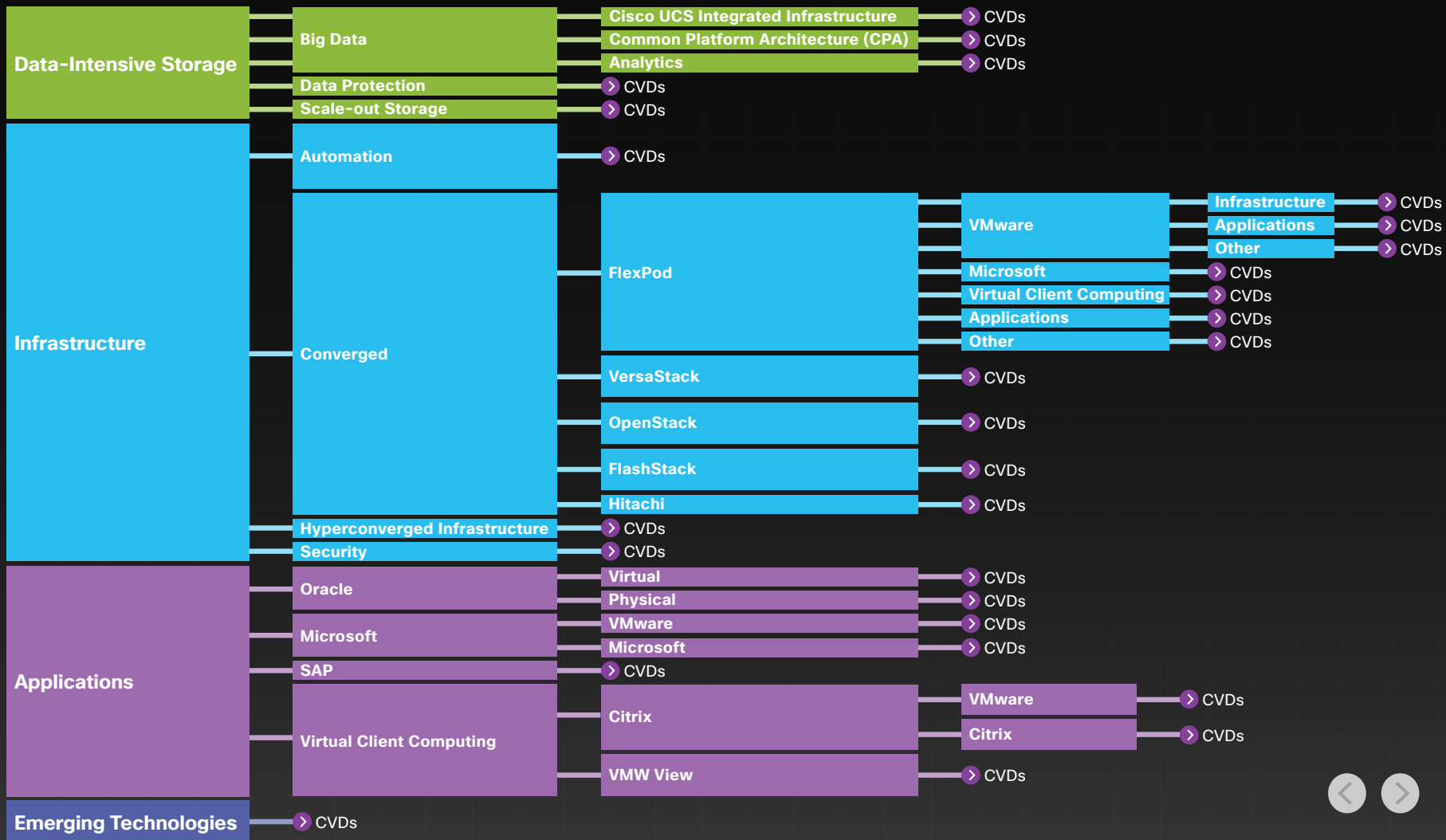
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| <p>1 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15 (Infrastructure, Applications)</p> <p>4 4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1</p> <p>5 5000 Seat FlashStack with Pure Storage FlashArray//m on VMware Horizon View 6.2 (Infrastructure, Applications)</p> <p>5 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2 (Infrastructure, Applications)</p> <p>B Big Data 60 node Hadoop Cluster with EMC Isilon
Big Data Cisco ACI with Cloudera</p> <p>Cisco and Hitachi Adaptive Solutions for Converged Infrastructure - <i>New</i></p> <p>Cisco and Hitachi Adaptive Solutions for SAP HANA TDI (Infrastructure, Applications) - <i>New</i></p> <p>Cisco HyperFlex 2.5 for Virtual Server Infrastructure</p> <p>Cisco HyperFlex 2.6 for Virtual Server Infrastructure</p> <p>Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V - <i>New</i></p> <p>Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi</p> <p>Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users (Infrastructure, Application) - <i>New</i></p> <p>Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V (Infrastructure, Applications) - <i>New</i></p> <p>Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware (Infrastructure, Applications) - <i>New</i></p> <p>Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users (Infrastructure, Applications)</p> <p>Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users (Infrastructure, Applications)</p> <p>Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7x Users (Infrastructure, Applications)</p> <p>Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users (Infrastructure, Applications)</p> <p>Cisco HyperFlex All-Flash with 1250 Citrix XenDesktop 7.16 Users & 1600 XenApp Sessions (Infrastructure, Applications) - <i>New</i></p> <p>Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage</p> | <p>1 B H</p> <p>4 C S</p> <p>5 F V</p> |
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Data Center Design Library





DC Design Sitemap





CVD Outline

DATA-INTENSIVE STORAGE

A. Big Data

1. Cisco UCS Integrated Infrastructure

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- 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





CVD Outline

DATA-INTENSIVE STORAGE (CONT.)

A. Big Data (cont.)

3. Analytics

Cisco SAS Edge to Enterprise IOT Analytics Platform

B. Data Protection

Cisco HyperFlex with Cohesity Data Protection - *New*

Cisco UCS for ScaleProtect with Cisco UCS S3260 Servers - *New*

Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments

Cisco HyperFlex with Veeam Availability Suite Deployment Guide for Single Data Center Deployment

FlashStack VSI with Commvault for Data Protection

C. Scale-Out Storage

Cisco UCS S3260 M5 Server with Cloudian HyperStore Object Storage - *New*

Cisco UCS S3260 M5 Storage Server with Scality RING - *New*

VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode - *New*

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage

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

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)

VersaStack for Data Center with Cisco UCS Director

B. Converged

1. FlexPod

a. VMware

I. Infrastructure

FlexPod Datacenter with Cisco ACI Multi-Pod, NetApp, MetroCluster IP, and VMware vSphere 6.7 - **New**

FlexPod Datacenter with VMware 6.5 Update1 and Cisco ACI 3.1

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 Datacenter with Nexus 9000 Standalone and vSphere 5.5U1

FlexPod Datacenter with vSphere 5.5U1





CVD Outline

INFRASTRUCTURE (CONT.)

a. VMware (cont.)

II. Applications

FlexPod with Microsoft Exchange 2013 on Cisco ACI

III. Other

FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI

b. Microsoft

FlexPod Datacenter with Microsoft Windows Hyper-V Server 2016 and Cisco ACI 3.0

FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vsphere 6.5

FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0

c. Virtual Client Computing

FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5 U1 for 5000 Seats

FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats

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

d. Applications

FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series - **New**

FlexPod Datacenter for SAP Solution with Cisco UCS Manager 3.2 and Cisco ACI

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

FlexPod with Microsoft Exchange 2013 on Cisco ACI

e. Other

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

FlexPod Datacenter with Oracle RAC on Oracle Linux

FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0





CVD Outline

INFRASTRUCTURE (CONT.)

B. Converged (cont.)

2. VersaStack

VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode - **New**

VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage

VersaStack with Cisco UCS M5 Servers, IBM SVC, and vSphere 6.5 U1

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

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

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

3. OpenStack

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

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

FlashStack Datacenter with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats - **New**

FlashStack for SAP HANA TDI - **New**

FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats





CVD Outline

INFRASTRUCTURE (CONT.)

B. Converged (cont.)

4. FlashStack (cont.)

FlashStack Virtual Server Infrastructure with Cisco ACI Multi-pod and Pure Storage ActiveCluster
 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15
 FlashStack Data Center with Oracle RAC 12cR2 Database
 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

5. Hitachi

Cisco and Hitachi Adaptive Solutions for Converged Infrastructure - **New**
 Cisco and Hitachi Adaptive Solutions for SAP HANA TDI - **New**

C. Hyperconverged Infrastructure

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V - **New**
 Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware - **New**
 Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 upto 4400 users - **New**
 Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users - **New**
 Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V - **New**
 Cisco HyperFlex Virtual Server Infrastructure 3.0 with Cisco ACI 3.2 and VMware vSphere 6.5 - **New**
 Cisco HyperFlex with Cohesity Data Protection - **New**





CVD Outline

INFRASTRUCTURE (CONT.)

C. Hyperconverged Infrastructure(cont.)

- Cisco HyperFlex with Hyper-V 3.0 for Virtual Server Infrastructure - **New**
- Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi
- Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop
- Cisco HyperFlex 2.6 for Virtual Server Infrastructure
- Cisco HyperFlex 2.5 for Virtual Server Infrastructure
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments
- 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

D. Security

- Secure Enclave Architecture





CVD Outline

APPLICATIONS

A. Oracle

1. Virtual

FlexPod Datacenter with Oracle RAC on Oracle Linux

2. Physical Server

FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series - **New**

FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

FlashStack Data Center with Oracle RAC 12cR2 Database

FlashStack for Oracle 12c RAC on Oracle Linux

FlashStack Data Center with Oracle RAC on Oracle Linux

B. Microsoft

1. VMware

FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5

FlexPod with Microsoft Exchange 2013 on Cisco ACI

2. Microsoft

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V - **New**

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware - **New**

C. SAP

Cisco and Hitachi Adaptive Solutions for SAP HANA TDI - **New**

FlashStack for SAP HANA TDI - **New**

FlexPod Datacenter with Cisco ACI for SAP HANA - **New**

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

Cisco UCS Integrated Infrastructure for SAP HANA





CVD Outline

APPLICATIONS (CONT.)

D. Virtual Client Computing

1. Citrix

a. VMware

FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats

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

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

4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

b. Citrix

Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users - **New**

Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users

Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop

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

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

2. VMW View

Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users - **New**

FlashStack Data Center with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats - **New**

FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5 U1 for 5000 Seats

Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users

FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats

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

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





CVD Outline

APPLICATIONS (CONT.)

2. VMW View (cont.)

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

EMERGING TECHNOLOGIES

Cisco UCS Infrastructure with Red Hat OpenShift Container Platform on VMware vSphere - *New*

Cisco UCS Infrastructure for Red Hat OpenShift Container Platform

VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage

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

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)

1

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4000 Seat XenDesktop 5.6/XenApp 6.5 Solution on vSphere 5.1

4

C

S

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)

5

F

V

B

Big Data 60 node Hadoop Cluster with EMC Isilon

Big Data Cisco ACI with Cloudera

C

Cisco and Hitachi Adaptive Solutions for Converged Infrastructure - **New**

Cisco and Hitachi Adaptive Solutions for SAP HANA TDI (Infrastructure, Applications) - **New**

Cisco HyperFlex 2.5 for Virtual Server Infrastructure

Cisco HyperFlex 2.6 for Virtual Server Infrastructure

Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V - **New**

Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi

Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users (Infrastructure, Applications) - **New**

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V (Infrastructure, Applications) - **New**

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware (Infrastructure, Applications) - **New**

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Alphabetical CVDs

- Cisco HyperFlex for Virtual Server Infrastructure 2.0.1a with All-Flash Storage
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- Cisco HyperFlex Virtual Server Infrastructure
- Cisco HyperFlex Virtual Server Infrastructure 3.0 with Cisco ACI 3.2 and VMware vSphere 6.5 - **New**
- Cisco HyperFlex with Cohesity Data Protection (Data-Intensive Storage, Infrastructure) - **New**
- Cisco HyperFlex with Hyper-V 3.0 for Virtual Server Infrastructure - **New**
- Cisco HyperFlex with Veeam Availability Suite
- C** Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments (Data-Intensive Storage, Infrastructure)
- Cisco HyperFlex with Veeam Availability Suite for Single Data Center Deployment (Data-Intensive Storage, Infrastructure)
- 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 for ScaleProtect with Cisco UCS S3260 Servers - **New**
- Cisco UCS Infrastructure for Red Hat OpenShift Container Platform Deployment Guide
- Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management
- Cisco UCS Infrastructure with Docker Datacenter for Container Management
- Cisco UCS Infrastructure with Red Hat OpenShift Container Platform on VMware vSphere - **New**
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Data Science at Scale





Alphabetical CVDs

C

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

Cisco UCS Integrated Infrastructure for Big Data and Analytics with MapR Data Platform - **New**

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

Cisco UCS Integrated Infrastructure with Splunk Enterprise

Cisco UCS Petabyte-Scale Solution for Splunk Enterprise

Cisco UCS S3260 M5 Server with Cloudbian HyperStore Object Storage - **New**

Cisco UCS S3260 M5 Storage Server with Scality RING - **New**

Cisco UCS S3260 Storage Server with Cloudera Enterprise

Cisco UCS S3260 Storage Server with Hortonworks Data Platform

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage (Data-Intensive Storage, Infrastructure)

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

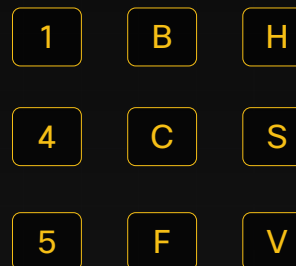
Cisco UCS Storage Server with Scality Ring

F

FlashStack Data Center with Oracle RAC 12cR2 Database (Infrastructure, Applications)

FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

FlashStack Data Center with Oracle RAC on Oracle Linux (Infrastructure, Applications)





Alphabetical CVDs

FlashStack Data Center with VMware Horizon 7.4 for 6000 seats (Infrastructure, Applications)
FlashStack Data Center with VMware Horizon 7.4 and VMware vSphere 6.5 U1 with Cisco UCS Manager 3.2 for 6000 seats (Infrastructure, Application) - **New**

1

B

H

FlashStack for Oracle 12c RAC on Oracle Linux (Infrastructure, Applications)

4

C

S

FlashStack for SAP HANA TDI (Infrastructure, Applications) - **New**

FlashStack Virtual Server Infrastructure

5

F

V

FlashStack Virtual Server Infrastructure with Cisco ACI Multi-pod and Pure Storage ActiveCluster

FlashStack VSI with Commvault for Data Protection (Data-Intensive Storage, Infrastructure)

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

FlexPod Datacenter for SAP Solution with Cisco UCS Manager 3.2 and Cisco ACI (Infrastructure, Applications)

FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series (Infrastructure, Applications)

FlexPod Datacenter with Cisco ACI and VMware 6.0U1

F FlexPod Datacenter with Cisco ACI Multi-Pod, NetApp MetroCluster IP, and VMware vSphere 6.7 - **New**

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

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

FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 seats (Infrastructure, Applications)

FlexPod Datacenter with Docker Datacenter for Container Management

FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0

FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5 (Infrastructure, Applications)

FlexPod Datacenter with Microsoft Windows Hyper-V Server 2016 and Cisco ACI 3.0

FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1

FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp Aff A-Series (Infrastructure, Applications) - **New**

FlexPod Datacenter with Oracle RAC on Oracle Linux

FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0





Alphabetical CVDs

F

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

FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5U1 for 5000 seats
- (Infrastructure, Applications)

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

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

FlexPod Datacenter with VMware 6.5 Update1 and Cisco ACI 3.1

FlexPod Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI (Infrastructure - Automation, Infrastructure - Converged)

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

FlexPod Datacenter with vSphere 5.5U1

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

FlexPod with Microsoft Exchange 2013 on Cisco ACI (Infrastructure, Applications)

1

B

H

4

C

S

5

F

V

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)

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)





Alphabetical CVDs

V

VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode
(Data-Intensive Storage, Infrastructure) - **New**

VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage
(Infrastructure, Emerging Technologies)

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 M5 Servers, IBM SVC, and vSphere 6.5 U1

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

1

B

H

4

C

S

5

F

V





Data-Intensive Storage | BIG DATA

Cisco UCS Integrated Infrastructure

Cisco UCS Integrated Infrastructure for Big Data and Analytics with MapR Data Platform

- New

Cisco UCS Integrated Infrastructure for BIG Data and Analytics with Cloudera for Data Science at Scale

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 Apache Hadoop

Cisco UCS Integrated Infrastructure with Application Centric Infrastructure (ACI) with 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 Cohesity
Data Protection

- New

Cisco UCS for ScaleProtect
with Cisco UCS S3260 Servers

- New

Cisco HyperFlex with Veeam
Availability Suite for Multisite
Deployments

Cisco HyperFlex with Veeam
Availability Suite Deployment
Guide for Single Data Center
Deployment

FlashStack VSI with
Commvault for Data
Protection





Data-Intensive Storage | SCALE-OUT STORAGE

Cisco UCS S3260 M5 Server with Cloudian HyperStore Object Storage

- New

Cisco UCS S3260 M5 Storage Server with Scality RING

- New

VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode

- New

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage

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

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)

VersaStack for Data Center with Cisco UCS Director



Infrastructure | CONVERGED | FLEXPOD

VMware

Infrastructure Applications Other

FlexPod Datacenter with Cisco ACI Multi-Pod, NetApp, MetroCluster IP, and VMware vSphere 6.7 *- New*

FlexPod Datacenter with VMware 6.5 Update1 and Cisco ACI 3.1

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 with Microsoft Exchange 2013 on Cisco ACI

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 Datacenter with VMware vSphere, Cisco UCS Director, Cisco ACI

FlexPod Datacenter with Nexus 9000 Standalone and vSphere 5.5U1

FlexPod Datacenter with vSphere 5.5U1





Infrastructure

CONVERGED

FLEXPOD

Microsoft

FlexPod Datacenter with Microsoft Windows Hyper-V Server 2016 and Cisco ACI 3.0

FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5

FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0

Virtual Client Computing

FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5U1 for 5000 seats

FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 seats

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

Applications

FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series

- New

FlexPod Datacenter for SAP Solution with Cisco UCS Manager 3.2 and Cisco ACI

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

FlexPod with Microsoft Exchange 2013 on Cisco ACI

Other

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

FlexPod Datacenter with Oracle RAC on Oracle Linux

FlexPod Datacenter with Red Hat Enterprise Linux OpenStack Platform 6.0



Infrastructure | CONVERGED

VersaStack

VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode
- New

VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage

VersaStack with Cisco UCS M5 Servers, IBM SVC, and vSphere 6.5 U1

Cisco UCS S3260 Storage Server with IBM Cloud Object Storage

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

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





Infrastructure | CONVERGED

OpenStack

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

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

FlashStack Datacenter with VMware Horizon 7.4 and VMware VSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats *- New*

FlashStack for SAP HANA TDI *- New*

FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats

FlashStack Virtual Server Infrastructure with Cisco ACI Multi-pod and Pure Storage ActiveCluster

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

FlashStack Data Center with Oracle RAC 12cR2 Database

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

CONVERGED

HITACHI

Cisco and Hitachi Adaptive
Solutions for Converged
Infrastructure

- New

Cisco and Hitachi Adaptive
Solutions for SAP HANA TDI

- New





Infrastructure

HYPERCONVERGED INFRASTRUCTURE

- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V - *New*
- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware - *New*
- Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 upto 4400 users - *New*
- Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users - *New*
- Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V - *New*
- Cisco HyperFlex Virtual Server Infrastructure 3.0 with Cisco ACI 3.2 and VMware vSphere 6.5 - *New*
- Cisco HyperFlex with Cohesity Data Protection - *New*
- Cisco HyperFlex with Hyper-V 3.0 for Virtual Server Infrastructure - *New*
- Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi
- Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware horizon 7 users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop
- Cisco HyperFlex 2.6 for Virtual Server Infrastructure
- Cisco HyperFlex 2.5 for Virtual Server Infrastructure
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments
- 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

Physical Server

FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series *- New*

FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

FlashStack Data Center with Oracle RAC 12cR2 Database

FlashStack for Oracle 12c RAC on Oracle Linux

FlashStack Data Center with Oracle RAC on Oracle Linux





Applications | MICROSOFT

VMware

FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5

FlexPod with Microsoft Exchange 2013 on Cisco ACI

Microsoft

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V

- New

Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware

- New





Applications | SAP

Cisco and Hitachi Adaptive Solutions for SAP HANA TDI

- New

FlashStack for SAP HANA TDI

- New

FlexPod Datacenter with Cisco ACI for SAP HANA

- New

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

Cisco UCS Integrated Infrastructure for SAP HANA





Applications | VIRTUAL CLIENT COMPUTING

Citrix

VMware

- FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users
- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
- 4000 Seat XenDesktop 5.6/ XenApp 6.5 Solution on vSphere 5.1

Citrix

- Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users *- New*
- Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop
- 1250 Users on FlashStack a Cisco UCS Mini and Pure // m10, with Citrix XenDesktop and XenApp 7.15
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2





Applications | VIRTUAL CLIENT COMPUTING

VMW View

Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users

- New

FlashStack Data Center with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats

- New

FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5 U1 for 5000 seats

Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users

FlashStack Data Center with VMware Horizon 7.4 for 6000 seats

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

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

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





Emerging Technologies

Cisco UCS Infrastructure
with Red Hat OpenShift
Container Platform on
VMware vSphere

- New

Cisco UCS Infrastructure for
Red Hat OpenShift Container
Platform

VersaStack for IBM Cloud
Private with Cisco UCS and
IBM Storage

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

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 Integrated Infrastructure for Big Data and Analytics with MapR Data Platform - **New**
- Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Data Science at Scale
- 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 for Big Data with Application Centric Infrastructure (ACI) and Cloudera
- Cisco UCS Integrated Infrastructure for Big Data with Hortonworks
- Cisco UCS Integrated Infrastructure for Big Data with MapR
- Cisco UCS Integrated Infrastructure for Big Data 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 Integrated Infrastructure for Big Data and Analytics with MapR Data Platform



TECHNICAL HIGHLIGHTS

- Cisco UCS C240 M5 2U-Rack Mount Servers.
- Cisco UCSM 4.0(1d)
- SUSE Linux Enterprise Serve 12 SP3
- MapR 6.1.0 Data Platform
- Installation and fine tuning MapR on a 28 Node cluster via MapR WebUI Installer and high availability



BUSINESS CHALLENGES

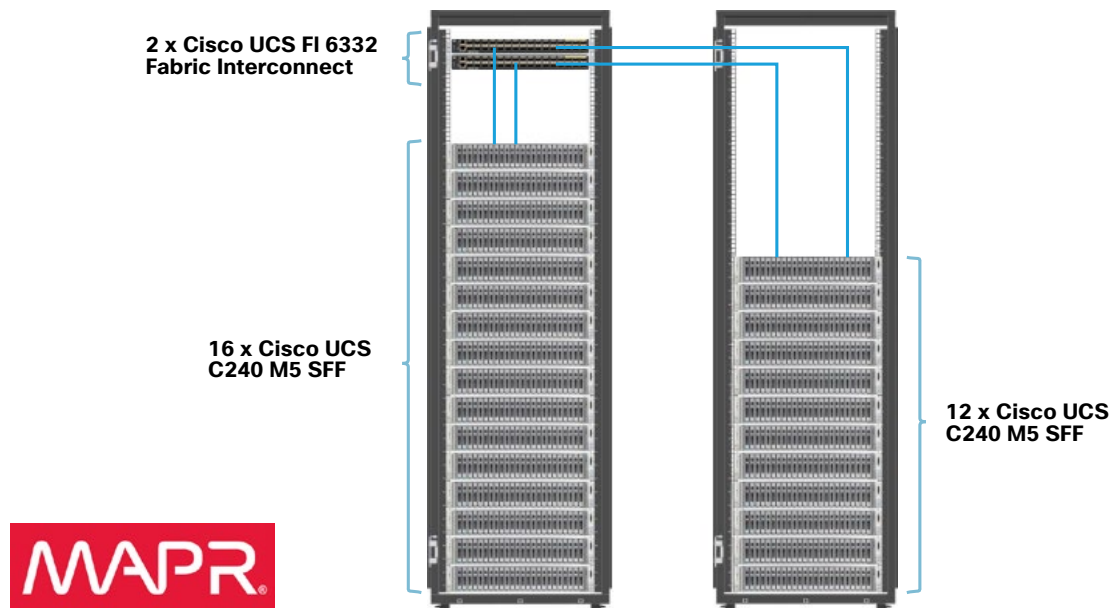
- Scalability and expansion of Big Data Infrastructure
- Cost effective solution for the full lifecycle of data, processing it as application needed.
- Data storage and quality



SUMMARY

- Simplified management through Cisco UCSM and MapR Control System (MCS)
- Ubiquitous high availability with no-NameNode architecture, YARN high availability, and NFS high availability
- Ease of deployment
- Scalability for Big Data workloads

ARCHITECTURE





Cisco UCS Integrated Infrastructure for Big Data and Analytics with Cloudera for Data Science at Scale



TECHNICAL HIGHLIGHTS

- Cisco UCS Rack Mount Servers C240 M5 with C480 M5 with GPUs
- CUDA enable containers
- Kubernetes managed Containers
- Deep Learning Frameworks such as Tensorflow



SUMMARY

- Deep Learning with data in Hadoop
- GPU accelerated Deep Learning
- Resource scheduling of GPU and CPU across multiple workloads

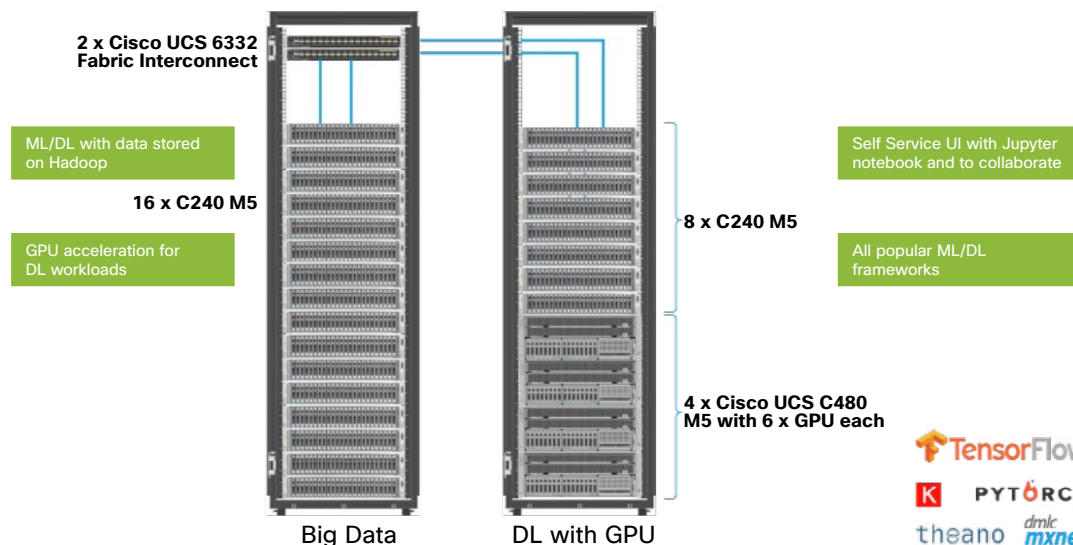
ARCHITECTURE



BUSINESS CHALLENGES

- Enabling Deep Learning jobs to use the massive amounts of data stored in a Big Data lake
- Enable Deep Learning jobs to make use of GPU for their processing
- Manage scheduling of multiple jobs on both CPU and GPUs

Cloudera Data Science Workbench





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

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

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 accommodate:

- 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)



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

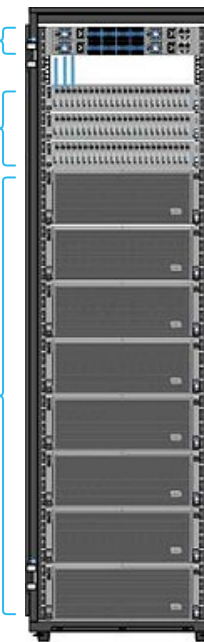
- Flexible Big Data platform powering the enterprise data hub with Cloudera Enterprise

ARCHITECTURE

2 Cisco UCS 6332 Fabric Interconnects

3 Cisco UCS C240 Servers

8 Cisco UCS S3260 Storage Chassis





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

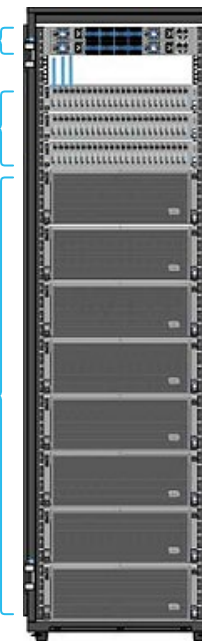
- Enterprise data lake using Cisco UCS S3260 Storage Server with Hortonworks Data Platform

ARCHITECTURE

2 Cisco UCS 6332 Fabric Interconnects

3 Cisco UCS C240 Servers

8 Cisco UCS S3260 Storage Chassis





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

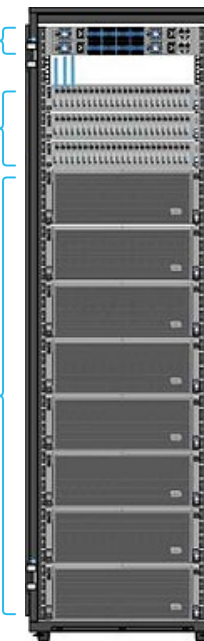
- Comprehensive integrated infrastructure for Big Data with MapR Converged Data Platform

ARCHITECTURE

2 Cisco UCS 6332 Fabric Interconnects

3 Cisco UCS C240 Servers

8 Cisco UCS S3260 Storage Chassis





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

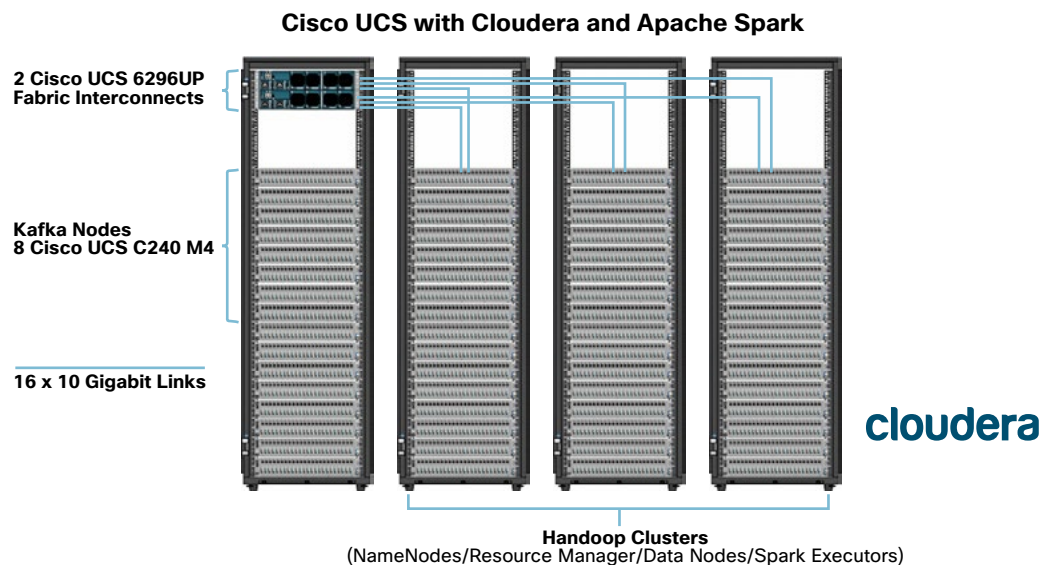
- Apache Spark brings batch and real-time data processing together to offer deeper and interactive insights to customers
- Spark Ecosystem offers a data-execution engine for all workloads with Spark Streaming, SparkSQL, and Spark Mlib
- Cloudera offers the fastest and easiest secure-data platform for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

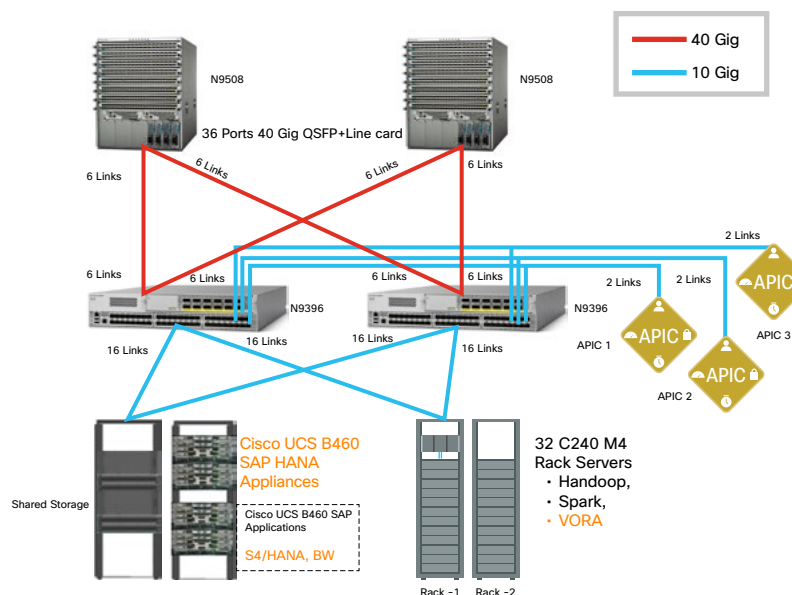
BUSINESS CHALLENGES

- 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





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

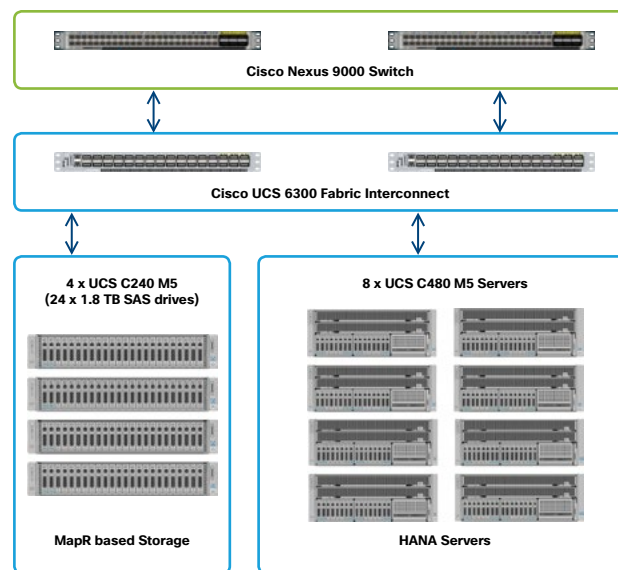
BUSINESS CHALLENGES

- 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 MAPR: 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: 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

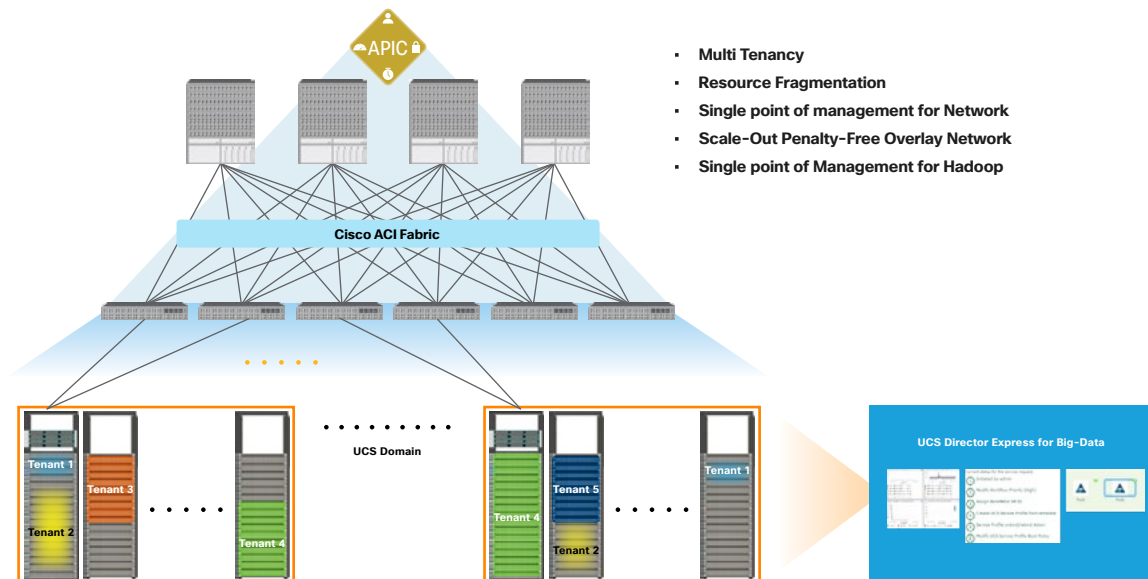
- Data center's biggest challenge is the provisioning and managing of the large number of Hadoop nodes
- Consolidating multiple-Hadoop clusters in a single, centrally managed physical cluster to improve infrastructure utilization, and provide access controls and security isolation between tenants



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





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

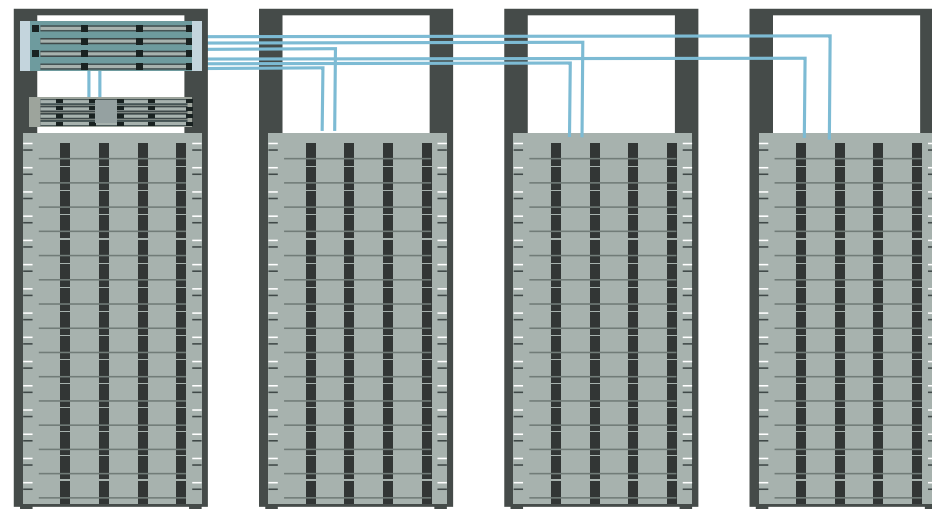
- Cisco and IBM provide enterprises with transparent, simplified data as well as management integration with an enterprise application ecosystem
- This solution helps organizations to exploit the valuable business insights in all their data, regardless of whether it's structured, semi structured or unstructured. 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



Cisco UCS Integrated Infrastructure and 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



SUMMARY

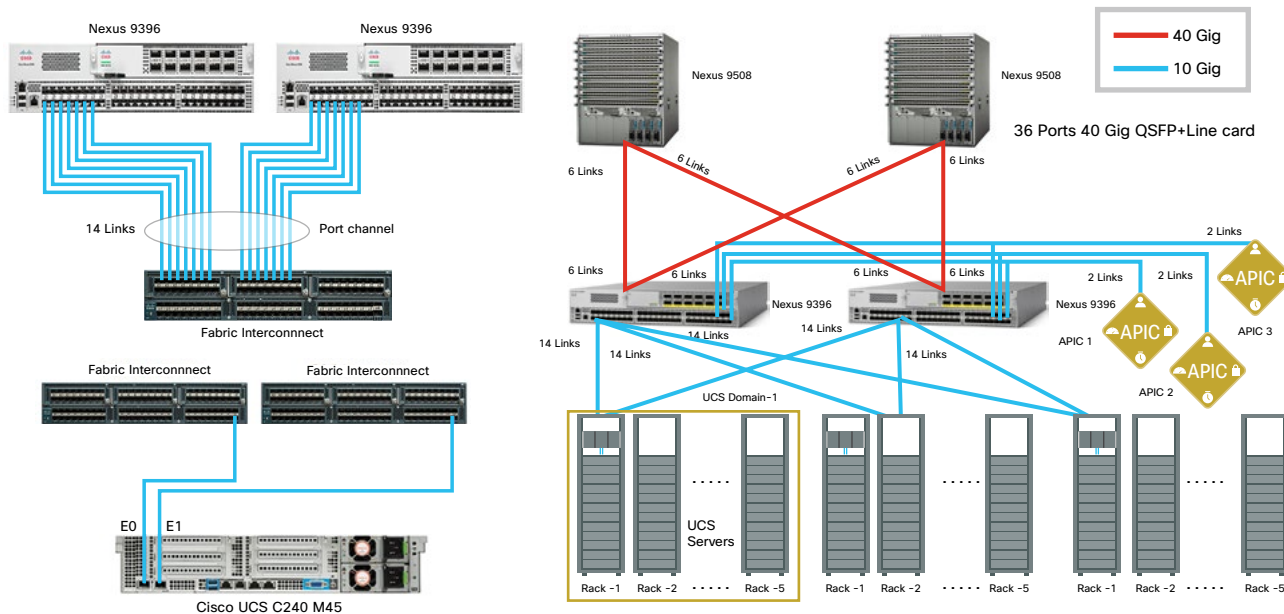
- Scaling to thousands of servers with no over-subscription within a UCS domain, and 5.7.1 over-subscription between domains
- Radically simplifies, optimizes, and accelerates the entire application deployment lifecycle
- The Cisco ACI policy model is designed top down using a promise theory model to 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



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

ARCHITECTURE





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





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

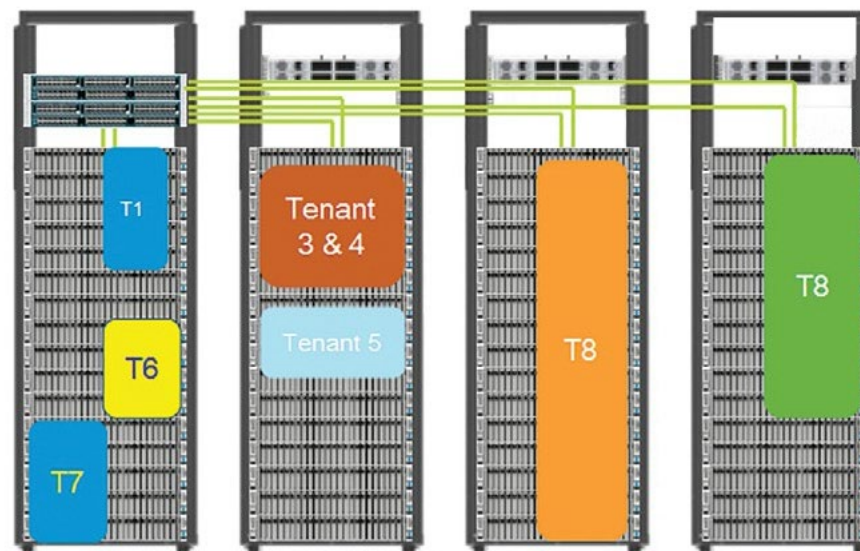
SUMMARY

- 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





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

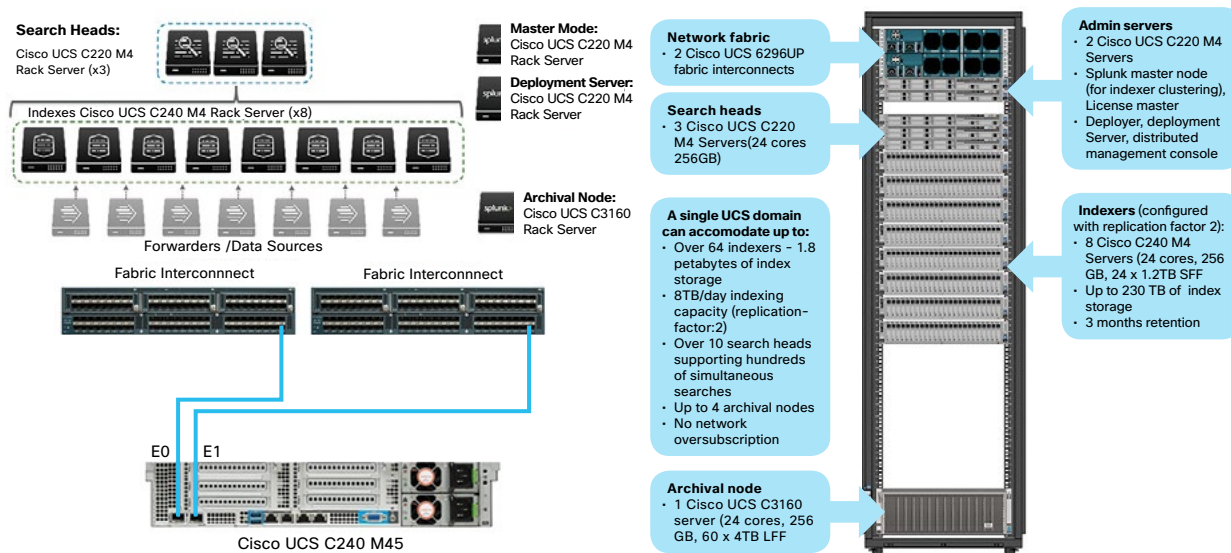
BUSINESS CHALLENGES

- 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 infrastructure 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





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

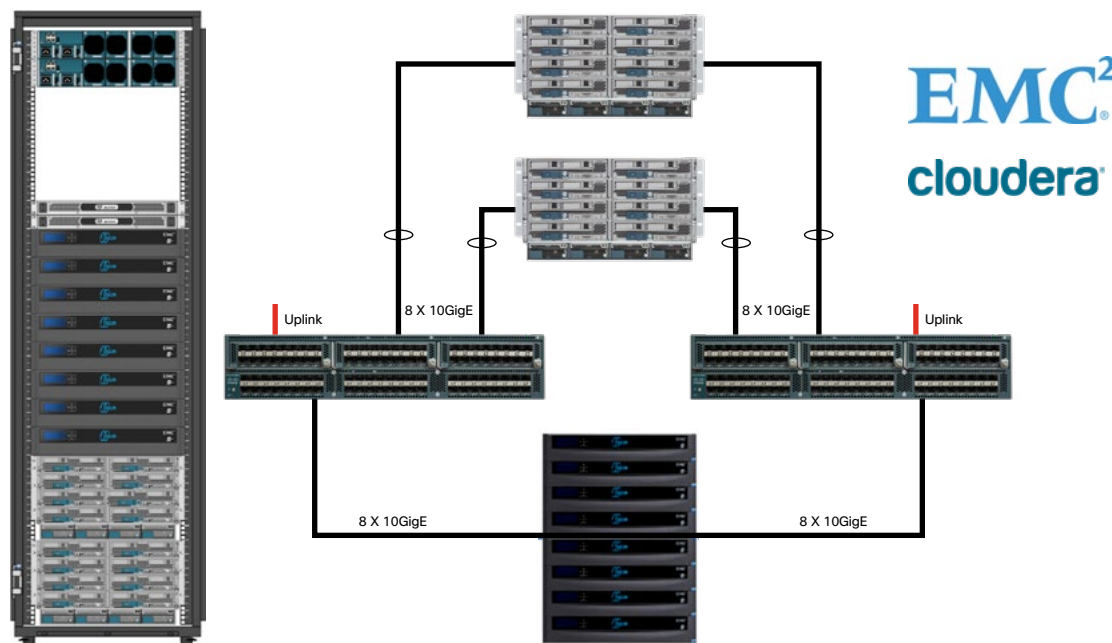
BUSINESS CHALLENGES

- 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



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

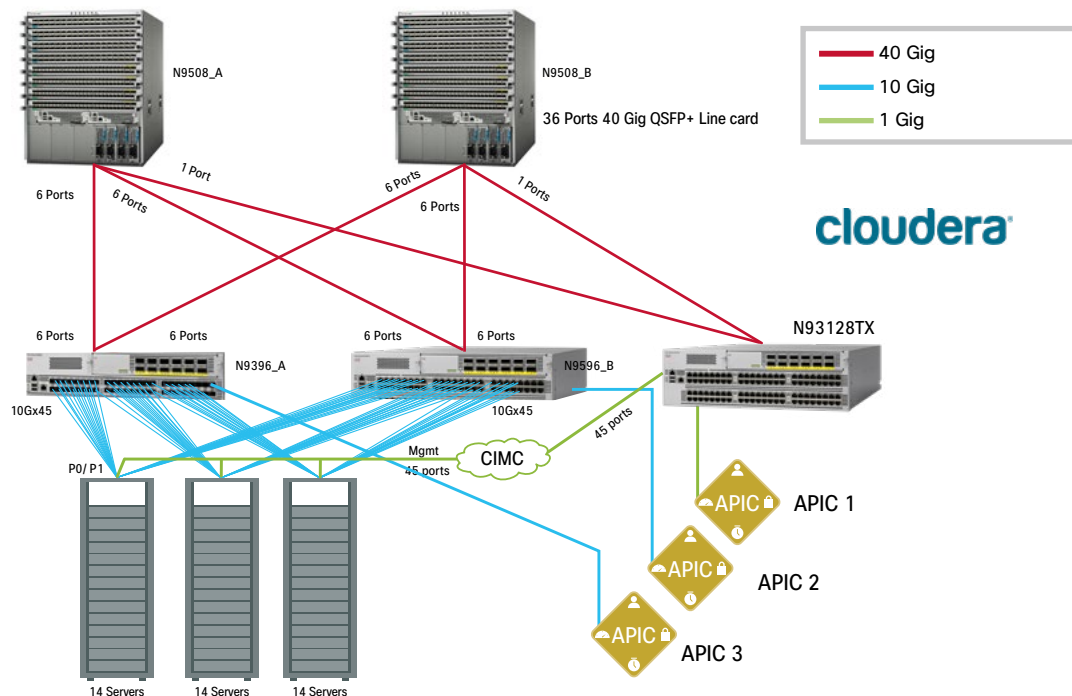
- Scalable performance and multi-tenancy in hardware
- Centralized network visibility with real time application health monitoring
- Simplified automation through application driven policy model
- Best practices for installing Cloudera Distribution for Apache Hadoop 5.0 tuned for performance and scalability



SUMMARY

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

ARCHITECTURE





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

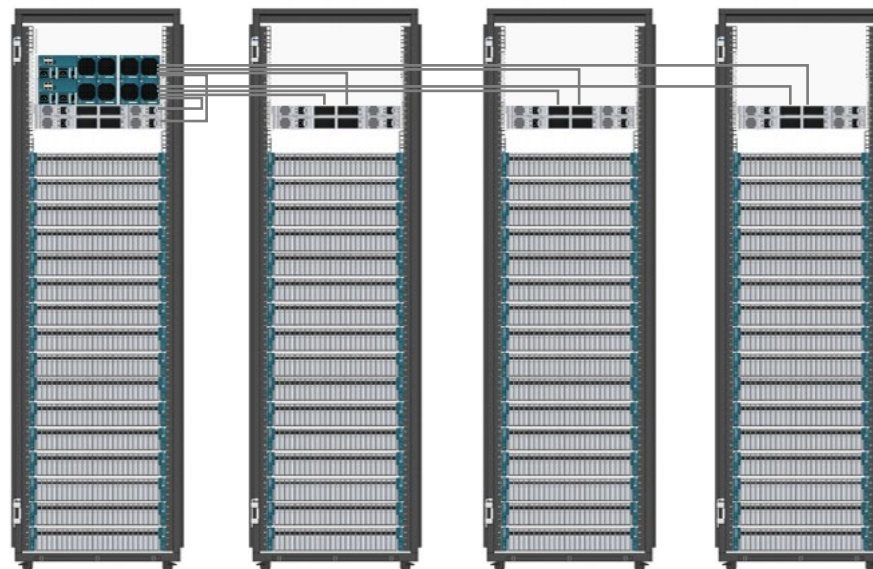
2x Cisco UCS Fabric Interconnect 6296UP

2x Cisco UCS Fabric Extender 2232PP

16X Cisco UCS C240M3 Server

8 x 10 Gigabit Links

cloudera





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)

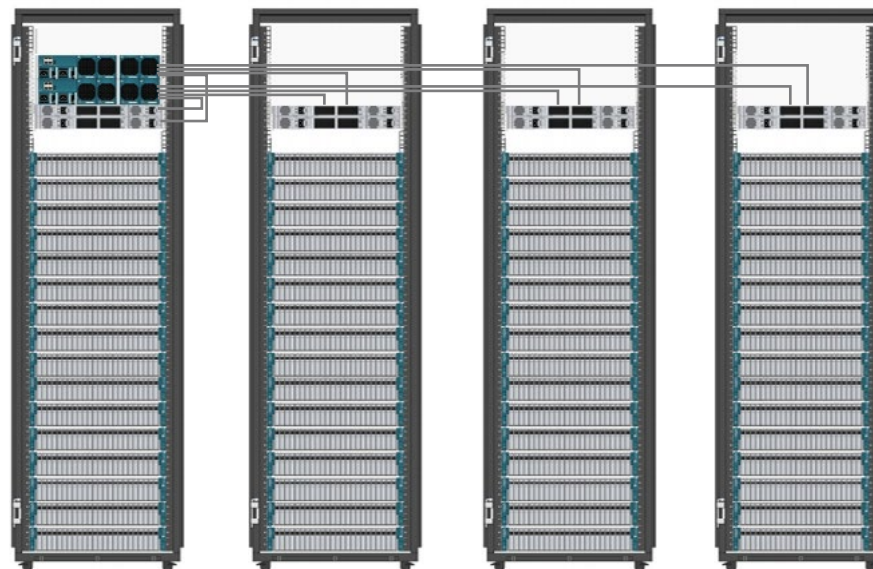
ARCHITECTURE

2x Cisco UCS Fabric Interconnect 6296UP

2x Cisco UCS Fabric Extender 2232PP

16X Cisco UCS C240M3 Server

8 x 10 Gigabit Links





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

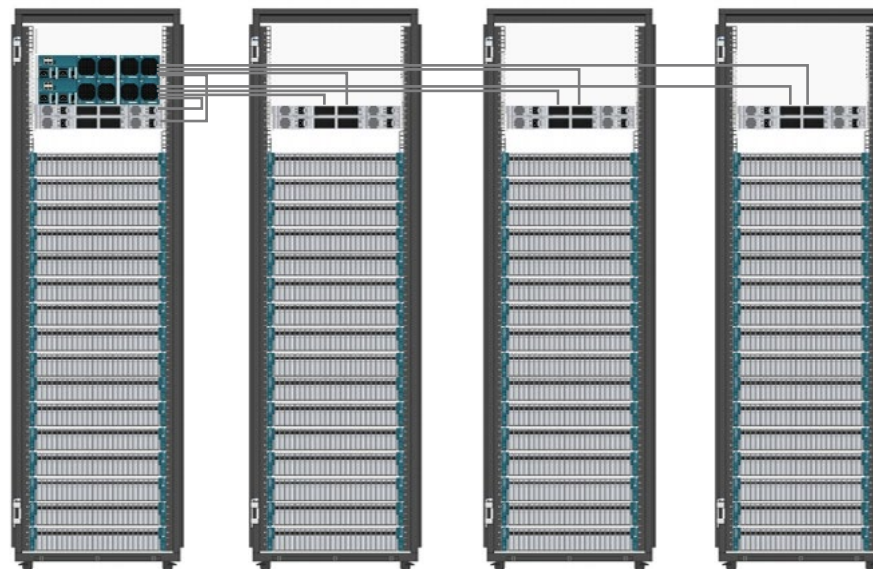
ARCHITECTURE

2x Cisco UCS Fabric Interconnect 6296UP

2x Cisco UCS Fabric Extender 2232PP

16X Cisco UCS C240M3 Server

8 x 10 Gigabit Links





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

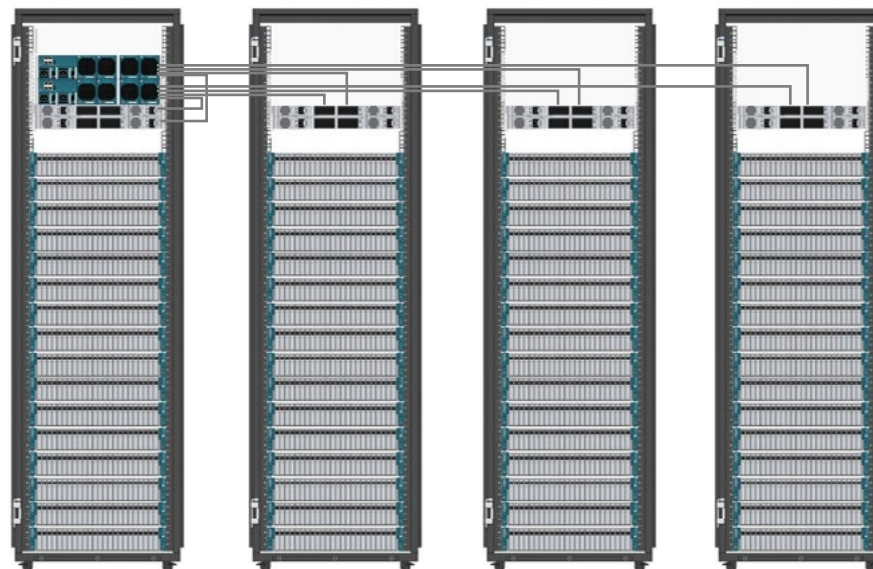
ARCHITECTURE

2x Cisco UCS Fabric Interconnect 6296UP

2x Cisco UCS Fabric Extender 2232PP

16X Cisco UCS C240M3 Server

— 8 x 10 Gigabit Links





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

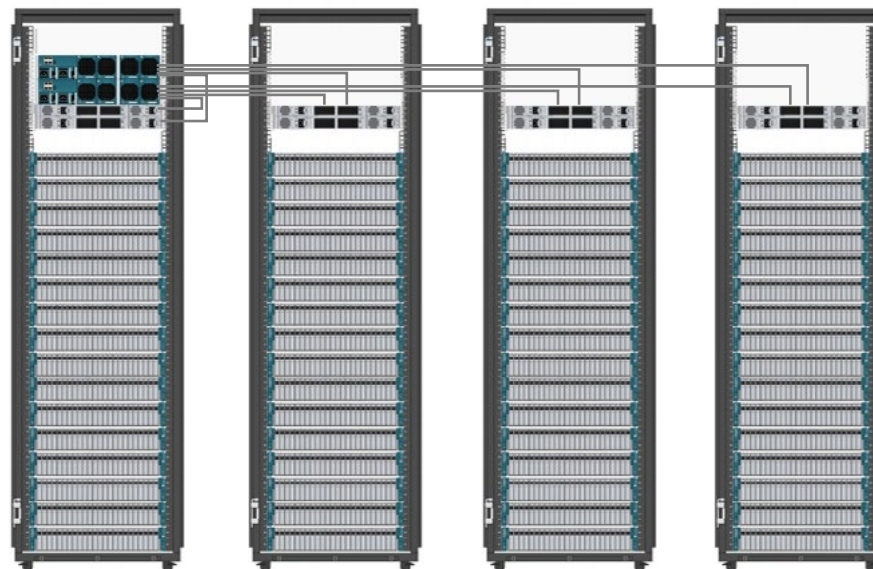
2x Cisco UCS Fabric Interconnect 6296UP

2x Cisco UCS Fabric Extender 2232PP

16X Cisco UCS C240M3 Server

8 x 10 Gigabit Links

Pivotal™





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

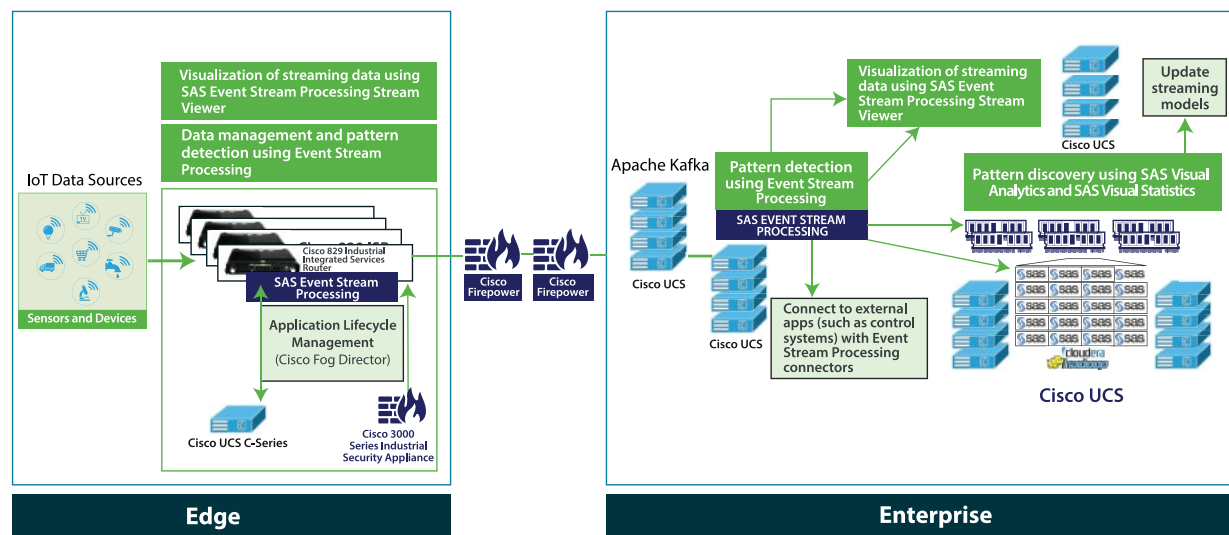
BUSINESS CHALLENGES

- 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





Data-Intensive Storage

DATA PROTECTION

- Cisco HyperFlex with Cohesity Data Protection - **New**
- Cisco UCS for ScaleProtect with Cisco UCS S3260 Servers - **New**
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments
- Cisco HyperFlex with Veeam Availability Suite Deployment Guide 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 Cohesity Data Protection

TECHNICAL HIGHLIGHTS

- Cohesity cluster of 3 or more Cisco C240 M5L servers using a specific Cohesity BoM
- Servers are UCS Managed, not standalone
- Solution based on 4th generation FI 6454 and VIC 1457
- Cisco UCSM 4.0(1c)
- Cisco HyperFlex 3.5(2a) or later required
- Cohesity version 6.1.1a or later required

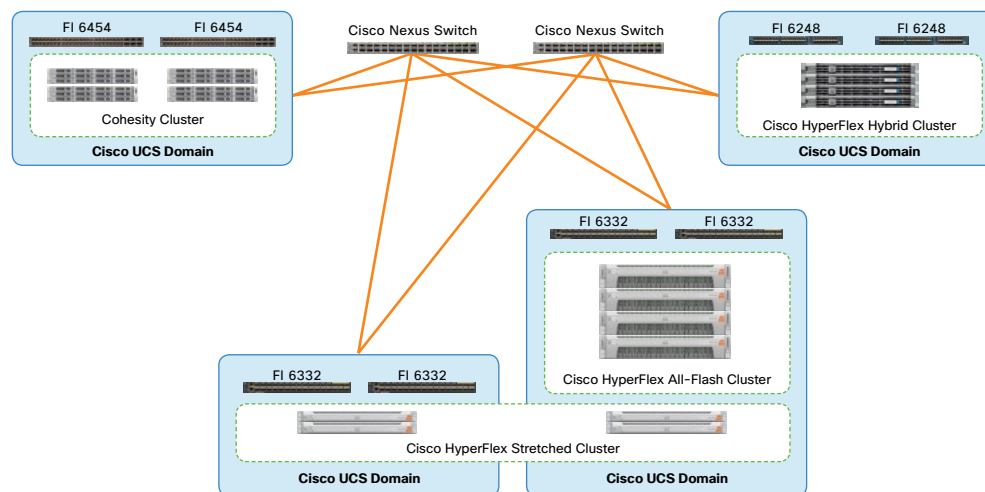
BUSINESS CHALLENGES

- Secondary storage systems (backup/replication/test) are often highly fragmented, using multiple platforms
- Traditional secondary storage systems do not scale well, leading to significant sprawl and complexity
- Outdated architectures do not work well with hyperconverged virtual systems and cloud

SUMMARY

- Cohesity integration with Cisco HyperFlex via the HX API for snapshot controls
- Cohesity cluster provides policy based VM protection for HyperFlex clusters or other external systems
- Rapid mass restores and return to service
- On-prem cluster to cluster backup replication and archiving, and to cloud
- Test/Dev temporary VM cloning

ARCHITECTURE





Cisco UCS for ScaleProtect with Cisco UCS S3260 Servers

TECHNICAL HIGHLIGHTS

- Modular, scalable, and highly resilient data management solution that is simple to install and manage.
- Turnkey Hyperconverged data management solution.
- Cisco UCS S3260 Storage Server with M5 Server Nodes.
- Cisco Nexus 9k Series Switches.
- Commvault Complete™ Backup and Recovery v11 and Commvault HyperScale Software.

BUSINESS CHALLENGES

- Challenge in protecting workloads with traditional Scale-up architectures.
- Missing service level agreements (SLAs) due to difficulty in scaling backup infrastructure for operational needs.
- Multiple data silos preventing the integration of applications, data, and infrastructure
- Complex data management and operations.

SUMMARY

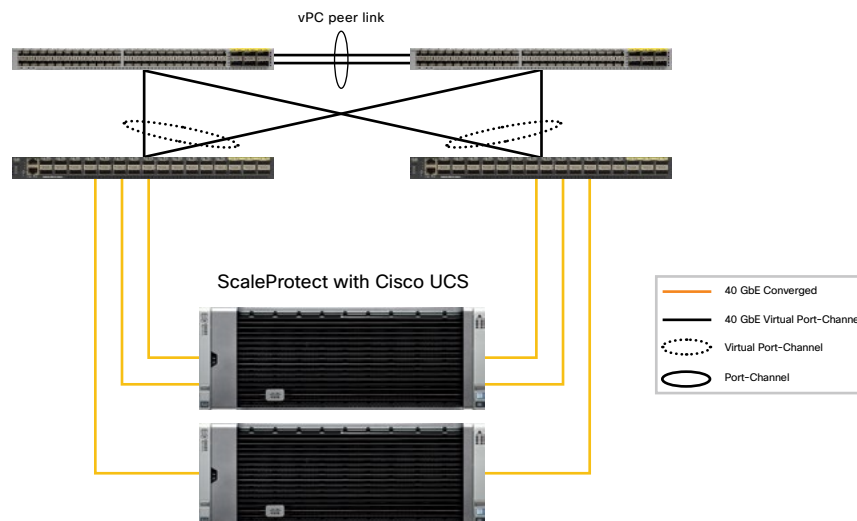
- Scale - Cut costs and reduce your hardware footprint by breaking down data silos.
- Manage - Remove operational complexity and gain more value from your data with native automation and orchestration capabilities.
- Optimize - Use operational metrics to tailor your service level agreements to your business demands and take advantage of hybrid cloud integration capabilities with no added hardware or appliances.

ARCHITECTURE

Cisco Nexus 9000 series switches

Cisco UCS 6300 series Fabric Interconnects

Cisco UCS S3260 M5 Storage Servers





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

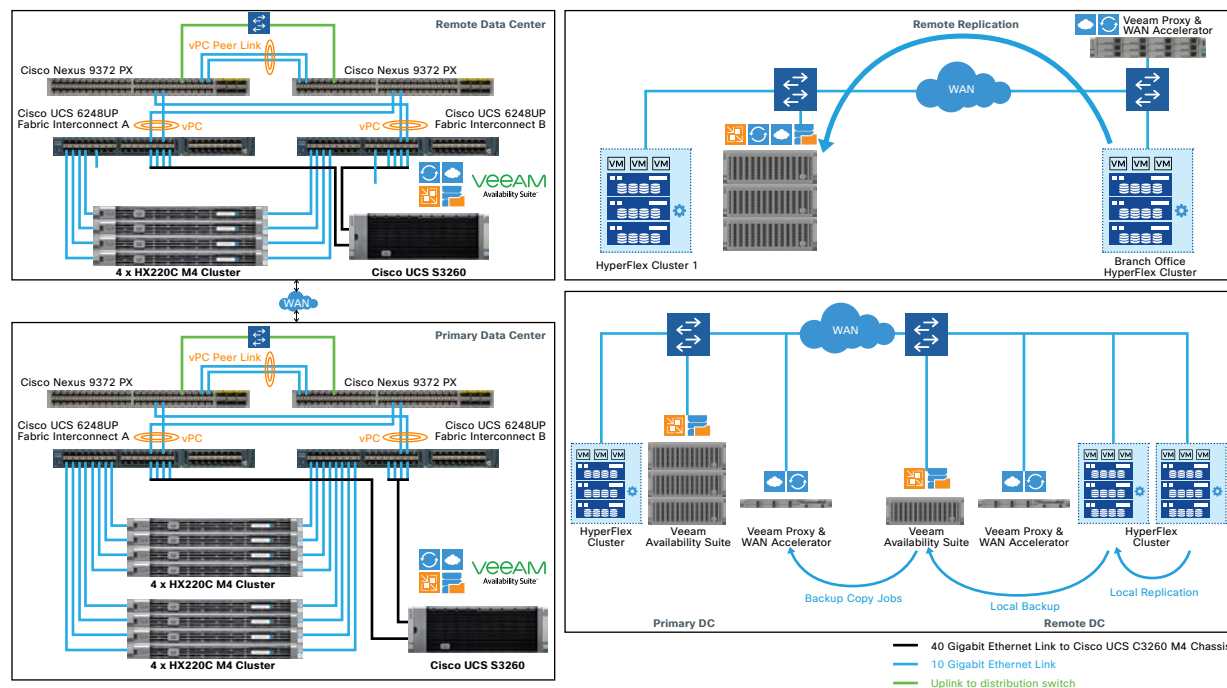
BUSINESS CHALLENGES

- 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





Cisco HyperFlex with Veeam Availability Suite Deployment Guide 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

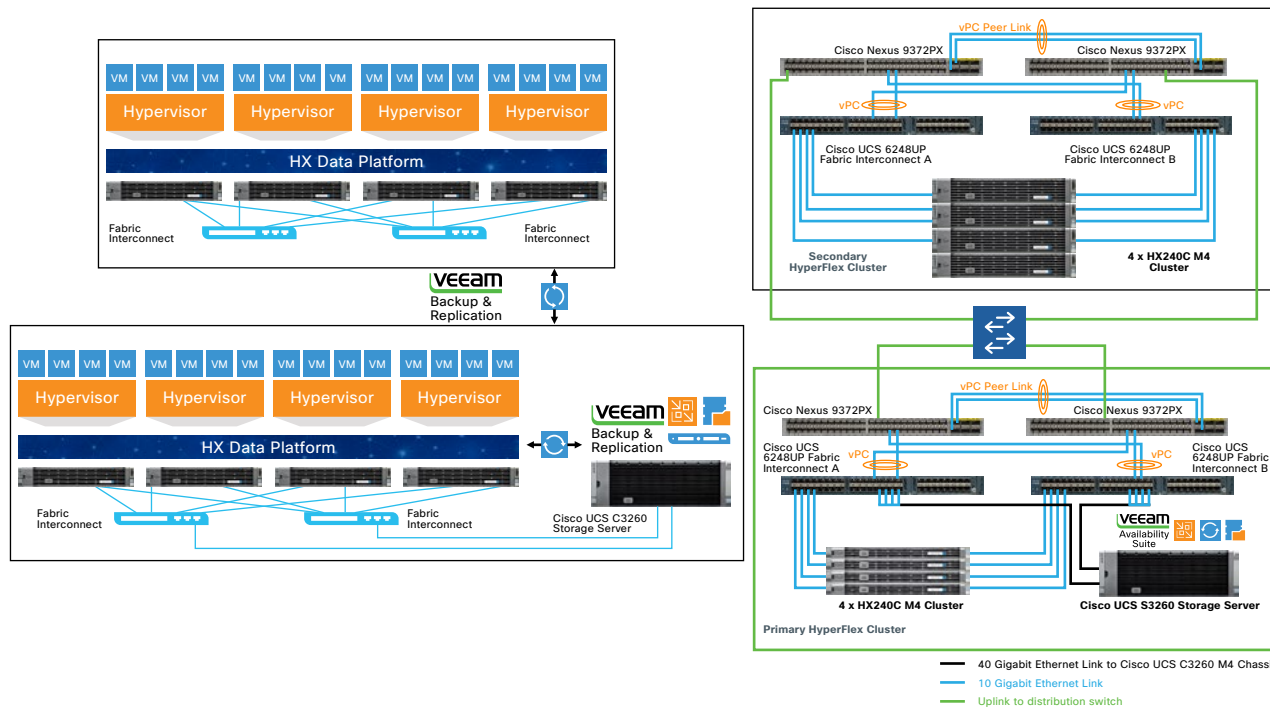
BUSINESS CHALLENGES

- 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





FlashStack VSI with Commvault for Data Protection

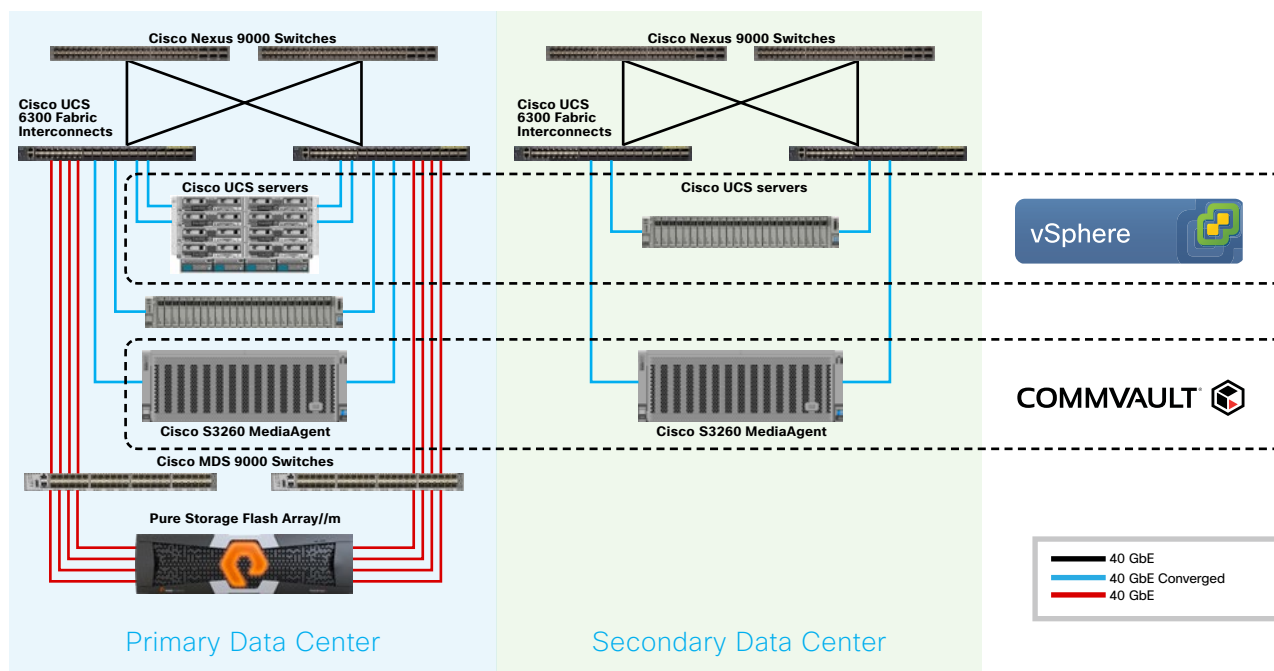
TECHNICAL HIGHLIGHTS

- 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

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



BUSINESS CHALLENGES

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





Data-Intensive Storage

SCALE-OUT STORAGE

- Cisco UCS S3260 M5 Server with Cloudian HyperStore Object Storage - **New**
- Cisco UCS S3260 M5 Storage Server with Scality RING - **New**
- VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode - **New**
- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage
- Cisco UCS S3260 Storage Server with SwiftStack Software Defined Object Storage
- 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 M5 Server with Cloudian HyperStore Object Storage

TECHNICAL HIGHLIGHTS

- End to end scale-out file and object storage offering with Cloudian HyperStore 7.1.2 on UCS S3260 M5 storage Server
- 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

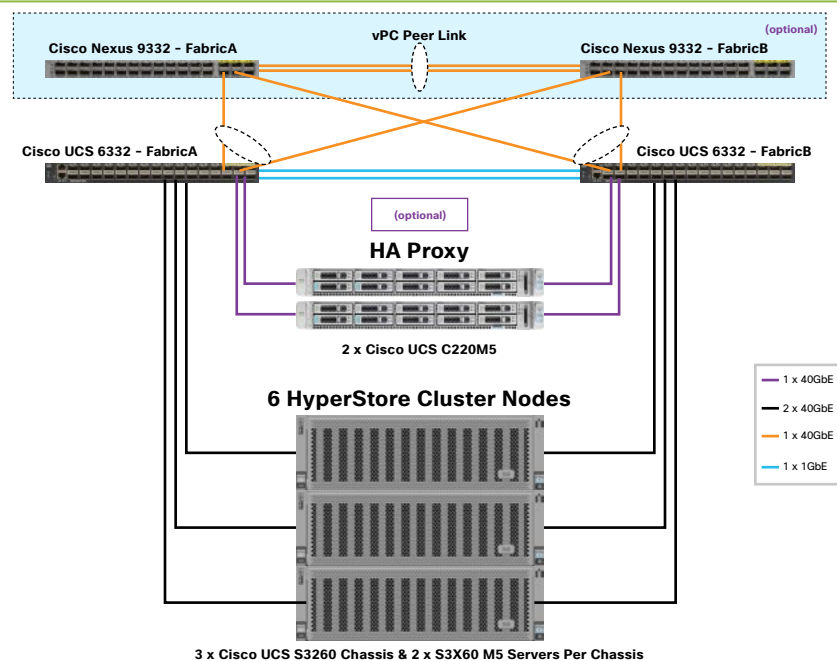
BUSINESS CHALLENGES

- 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 Cloudian are collaborating to offer customers a scalable object storage solution for unstructured data that is integrated with Cloudian HyperStore Storage
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center.

ARCHITECTURE





Cisco UCS S3260 M5 Storage Server with Scality RING

TECHNICAL HIGHLIGHTS

- End to end scale-out file and object storage offering with Scality RING 7.4 on UCS S3260 M5 storage Server
- 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

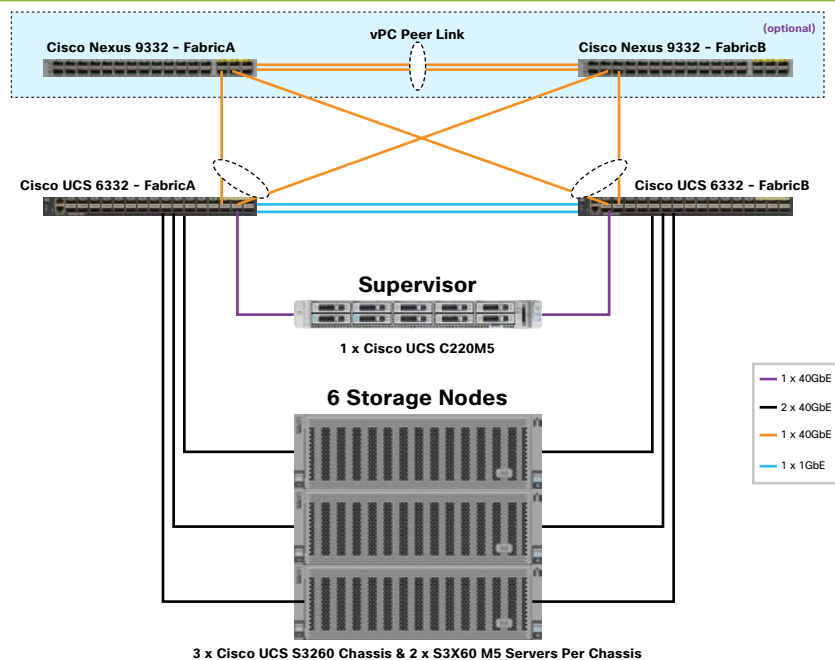
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- IOT and digital transformation is driving data growth and it is putting tremendous pressure on IT
- IDC shows that 80% of new data that is being generated is unstructured and it cannot be addressed by traditional storage.
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SUMMARY

- 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



3 x Cisco UCS S3260 Chassis & 2 x S3X60 M5 Servers Per Chassis

CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_s3260_m5_scalityring.html

Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_s3260m5_scality_design.html



VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode

TECHNICAL HIGHLIGHTS

- End to end 40G capable UCS Architecture delivers scalable infrastructure starting with just three C240 M5 nodes.
- 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

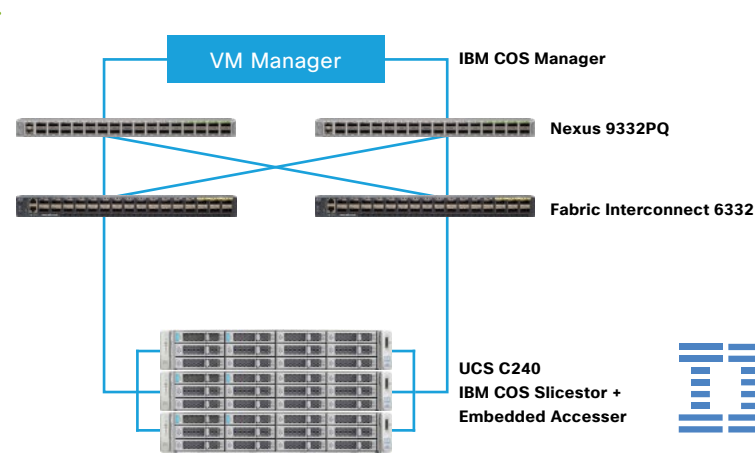
- Enterprises today struggle to use scale-out storage solutions to start small and grow as needed.
- 70% of IT decision maker believe that their current storage systems will not be able to handle the growth of unstructured data.
- Inadequate storage infrastructure is considered to be a significant pain 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 Nexus 9332
- 2 x 6332 Fabric Interconnects
- Full Deployment UCS Managed
- 40 GbE end-to-end
- Starting low with 72 TB usable - 6RU





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





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

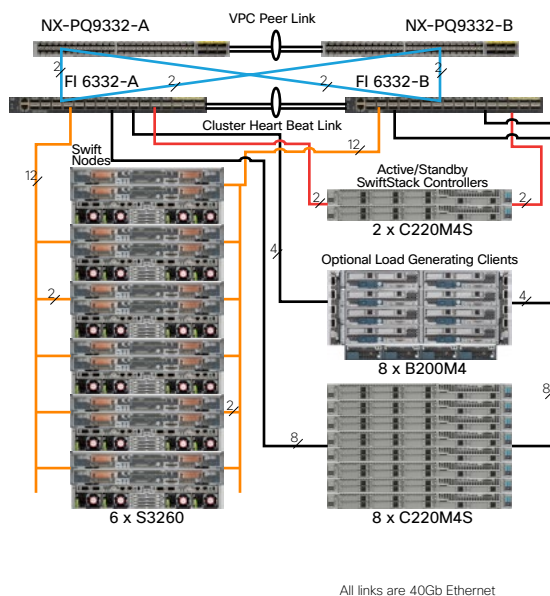
- Unstructured data is growing at an exponential rate and it is putting tremendous pressure on IT
- Enterprises require cloud-scale infrastructure that can scale seamlessly without any limitation
- Legacy storage cannot address unstructured data challenges which requires cloud-like economies of scale

SUMMARY

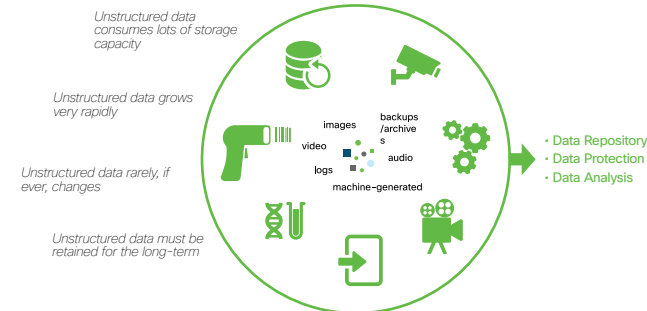
- Best-of-Breed scale-out storage solution by SwiftStack and Cisco UCS
- Pre-validated scale-out storage solution backed by CVD to provide cloud-like agility and flexibility to your data center
- Hybrid cloud storage solution for current and next generation applications

ARCHITECTURE

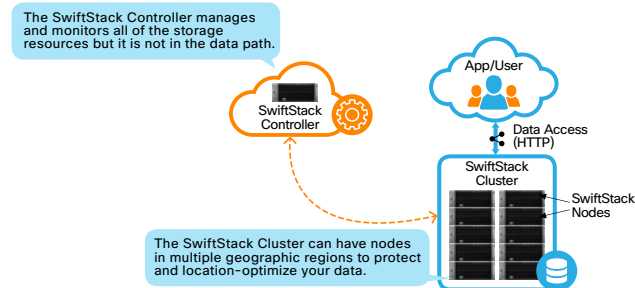
SwiftStack Object Storage on Cisco UCS S3260



Object Storage Use Cases



SwiftStack System Architecture





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

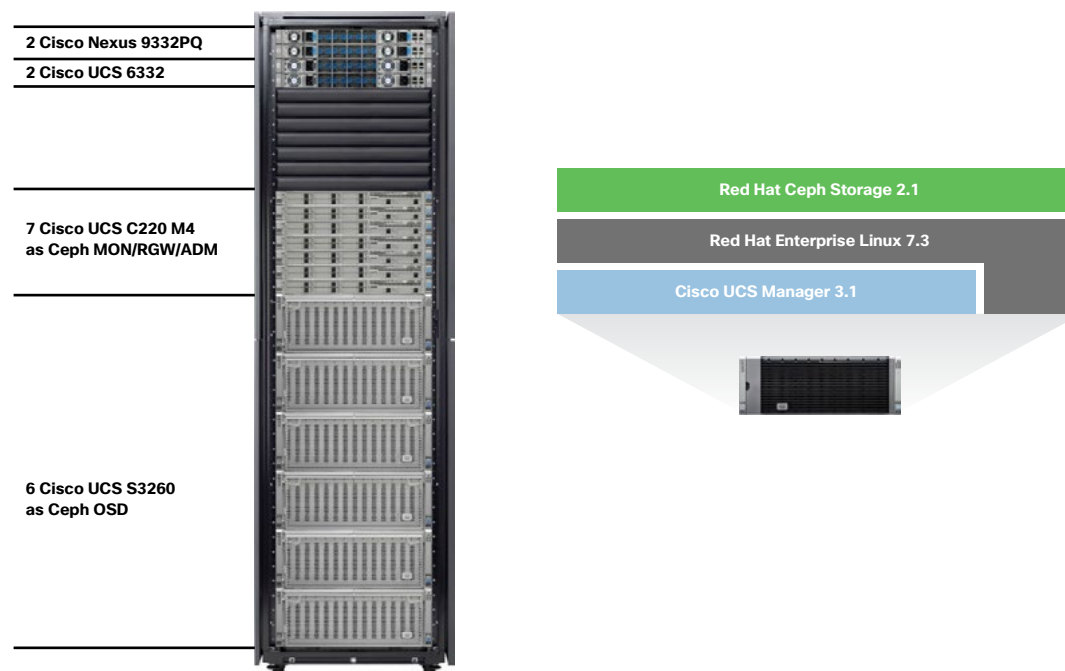
BUSINESS CHALLENGES

- 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





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

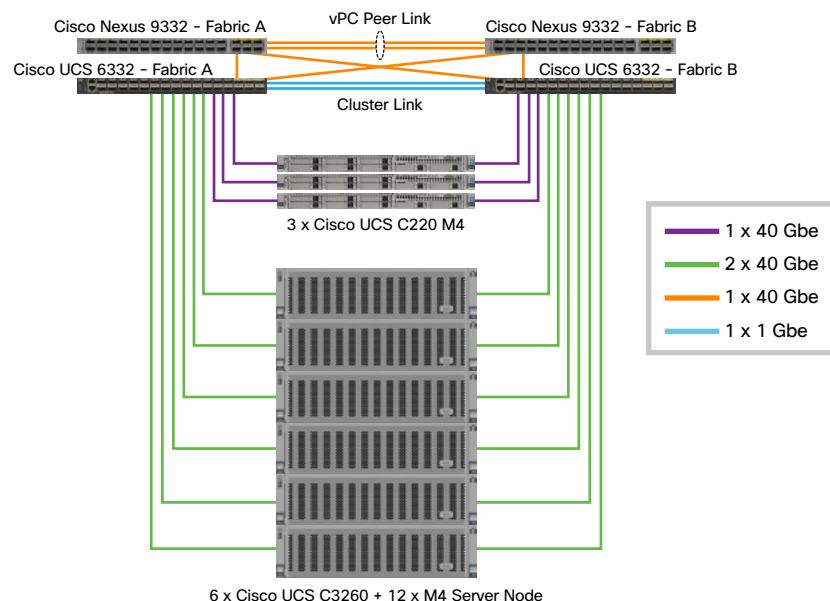
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- Massively scalable, software-defined storage system that gives you unified storage to run your business
- Cisco and Scality are collaborating to offer customers a scalable object storage solution for unstructured data that is integrated with Scality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

ARCHITECTURE





Infrastructure | Automation

- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution
- 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)
- VersaStack for Data Center with Cisco UCS Director

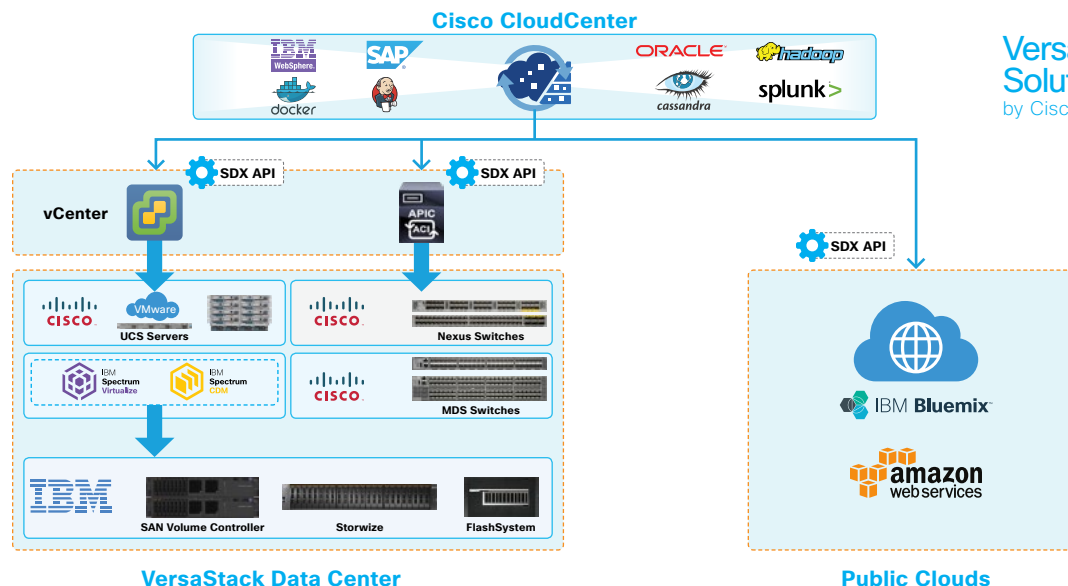
Cisco is leading the market in converged infrastructure revenues. According to IDC, Cisco's leadership is due to a variety of reasons, including market leader/maturity, vendor familiarity, and quality product/brand/reliability.

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

TECHNICAL HIGHLIGHTS SUMMARY

- 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
- “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



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





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



SUMMARY

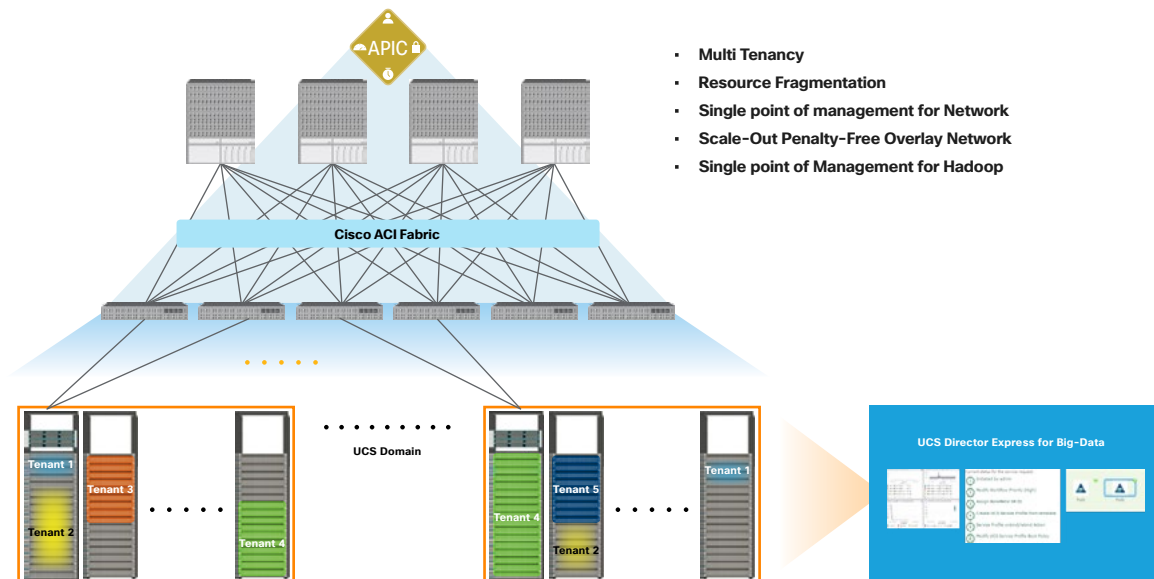
- Cisco UCSDE provides centralized visibility into the complete infrastructure and big data application to identify potential failures and latent threats before they affect application and business performance
- ACI provides centralized visibility to the entire network with deep telemetry and real-time 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



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

ARCHITECTURE



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





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





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

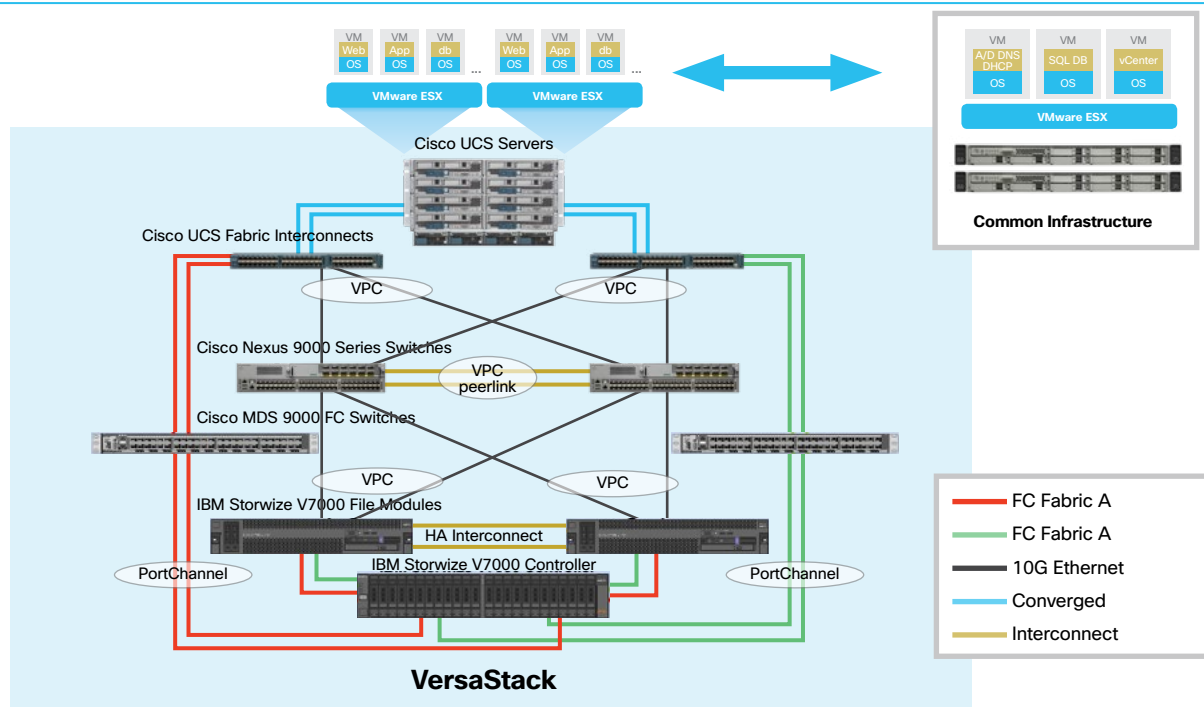
BUSINESS CHALLENGES

- 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





Infrastructure | Converged

FLEXPOD

VMware: Infrastructure

- FlexPod Datacenter with Cisco ACI Multi-Pod, NetApp, MetroCluster IP, and VMware vSphere 6.7 - **New**
- FlexPod Datacenter with VMware 6.5 Update1 and Cisco ACI 3.1
- 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 Datacenter with Nexus 9000 Standalone and vSphere 5.5U1
- FlexPod Datacenter with vSphere 5.5U1

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 Cisco ACI Multi-Pod, NetApp, MetroCluster IP, and VMware vSphere 6.7

TECHNICAL HIGHLIGHTS

- Cisco ACI Multi-Pod using ACI 3.2 release
- Cisco UCS 3.2(3d) release; B200 M5 servers
- VMware vSphere 6.7 hypervisor
- NetApp MetroCluster IP using ONTAP 9.4
- No single point of failure; redundant devices and connectivity; expandable design
- Cisco ACI providing automation and orchestration capabilities for the design

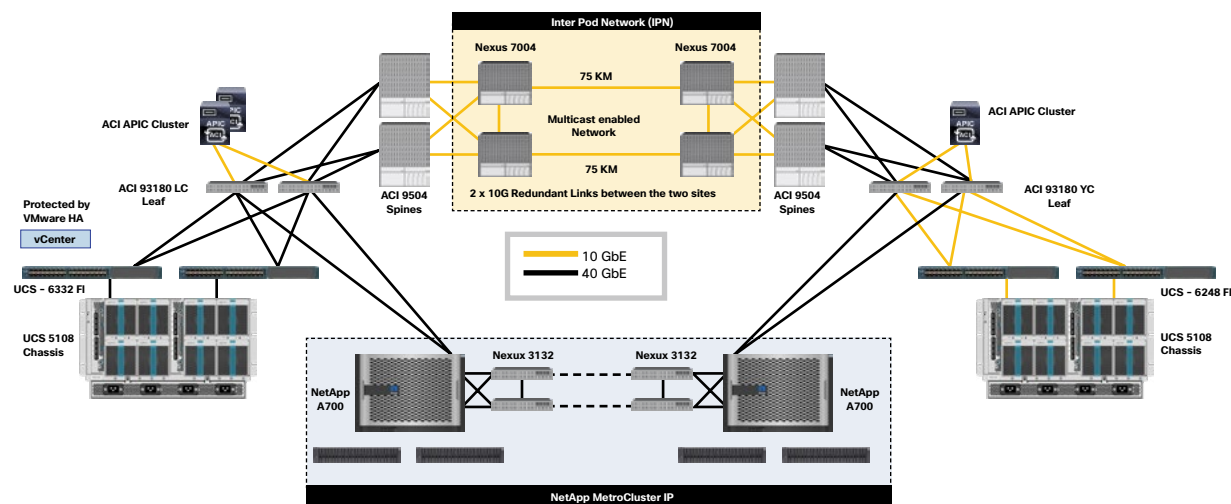
BUSINESS CHALLENGES

- Typical high availability solutions are limited to a single site and therefore do not safeguard against site failures
- Traditional multi-datacenter solutions are complex and difficult to deploy and maintain
- Providing cross site high-availability requires purchase of additional technologies, features and licensing

SUMMARY

- Infrastructure high availability and disaster recovery in a metropolitan area
- Interconnecting and centrally managing connectivity across two geographically dispersed datacenters using ACI Multi-Pod
- Seamless workload mobility across the sites
- NetApp MetroCluster IP configuration using IP-only network to provide non-disruptive storage HA in active-active configuration

ARCHITECTURE





FlexPod Datacenter with VMware 6.5 Update1 and Cisco ACI 3.1

TECHNICAL HIGHLIGHTS

- End-to-end IP design using a Cisco ACI fabric to provide 40GbE connectivity to compute and storage sub-system, and 10GbE to outside networks
- Cisco UCS Manager 3.2(3a) running on Cisco UCS 6332 FIs, and UCS B- and C-series M5 servers running vSphere 6.5U1
- Cisco ACI 3.1(1i) using Nexus 9336PQ Spines and 9332PQ Leaf switches to deliver a policy-based 40GbE data center fabric
- NetApp AFF A300 arrays running Clustered Data ONTAP 9.3 to enable 40GbE connectivity to IP based storage (iSCSI and NFS). Optional support for 16G FC access by connecting directly or via SAN, to UCS FI.

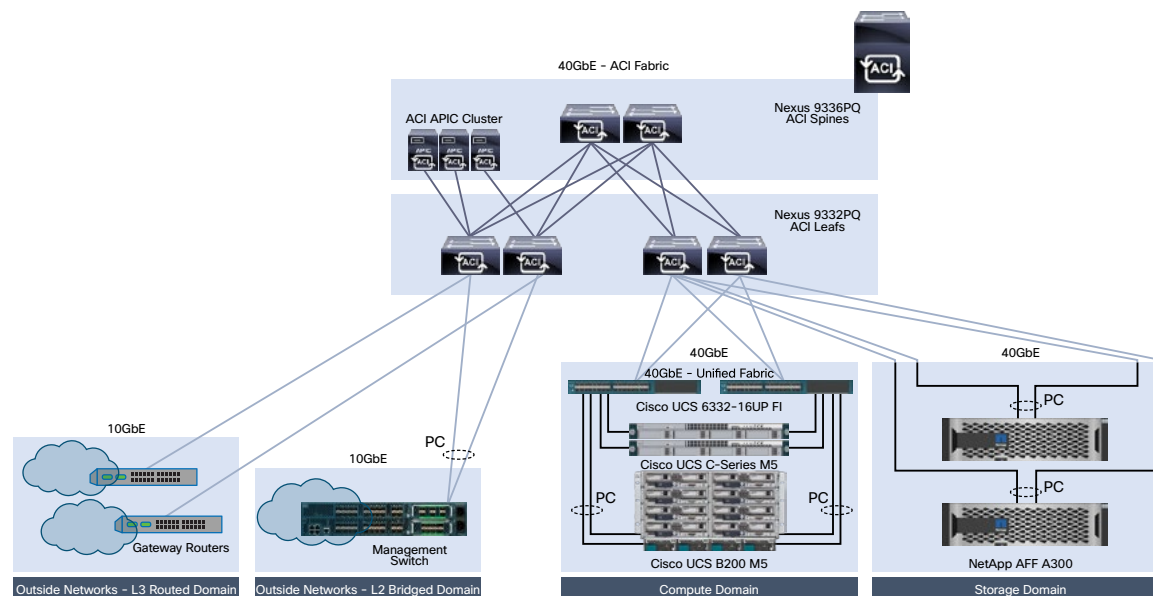
BUSINESS CHALLENGES

- Provide a scalable, multi-tenant data center platform with the flexibility and agility to support rapidly evolving business requirements
- Improve IT agility and deployment time for new applications while minimizing integration costs

SUMMARY

- Next Generation Data Center Infrastructure for Enterprise & Cloud deployments using Cisco UCS, Cisco ACI and NetApp All Flash FAS (AFF) for IP based storage
- Flexible, policy-based, programmable Infrastructure to simplify and accelerate deployment lifecycle of new applications
- Advanced Capabilities of Nexus 9000 Switches with Cisco ACI to provide a secure, multi-tenant data center platform with deep telemetry, centralized visibility and management

ARCHITECTURE



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi65u1_n9k_aci.html

Design: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi65u1_n9k_aci_design.html





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



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

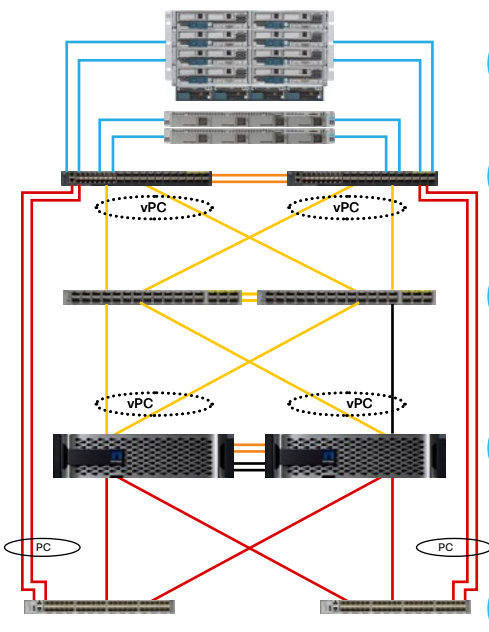


BUSINESS CHALLENGES

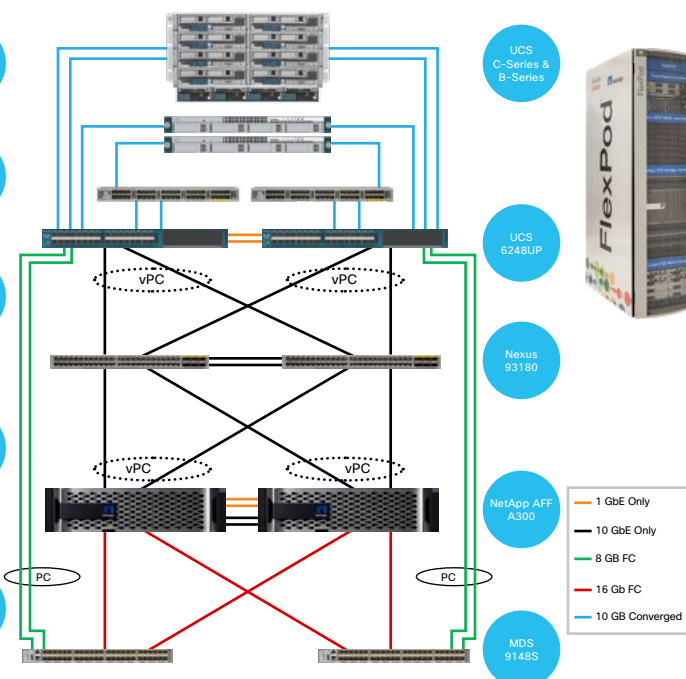
- Improve utilization rates
- Reduce time to deployment of new applications
- Ease infrastructure management burdens
- Reduce risk of downtime

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation



CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi65u1_n9fc.html

Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi65design.html





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

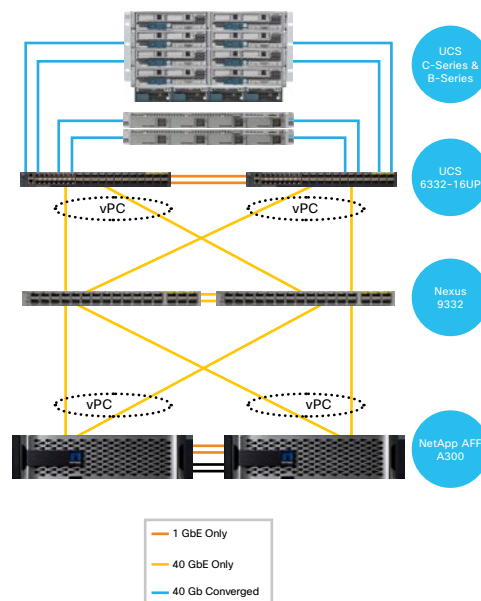
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SUMMARY

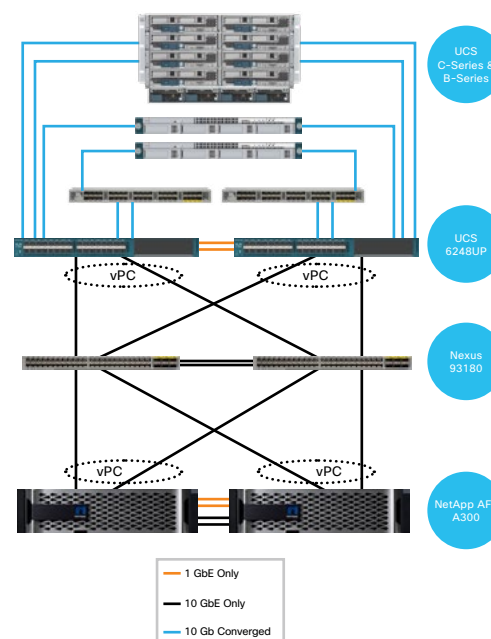
- Converged infrastructure for the next-generation data center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation





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

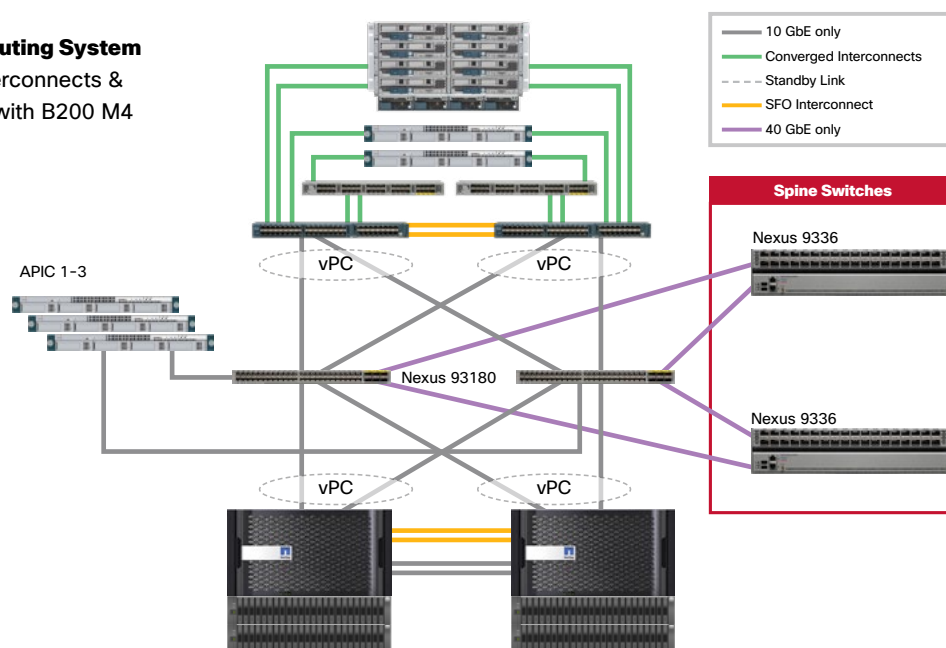
ARCHITECTURE

Cisco Unified Computing System

UCS 6248 Fabric Interconnects & 5108 Blade Chassis with B200 M4

Cisco ACI Fabric

APIC, Nexus 9300



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi60u1_n9k_aci.html

Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi60u1_n9k_aci_design.html





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

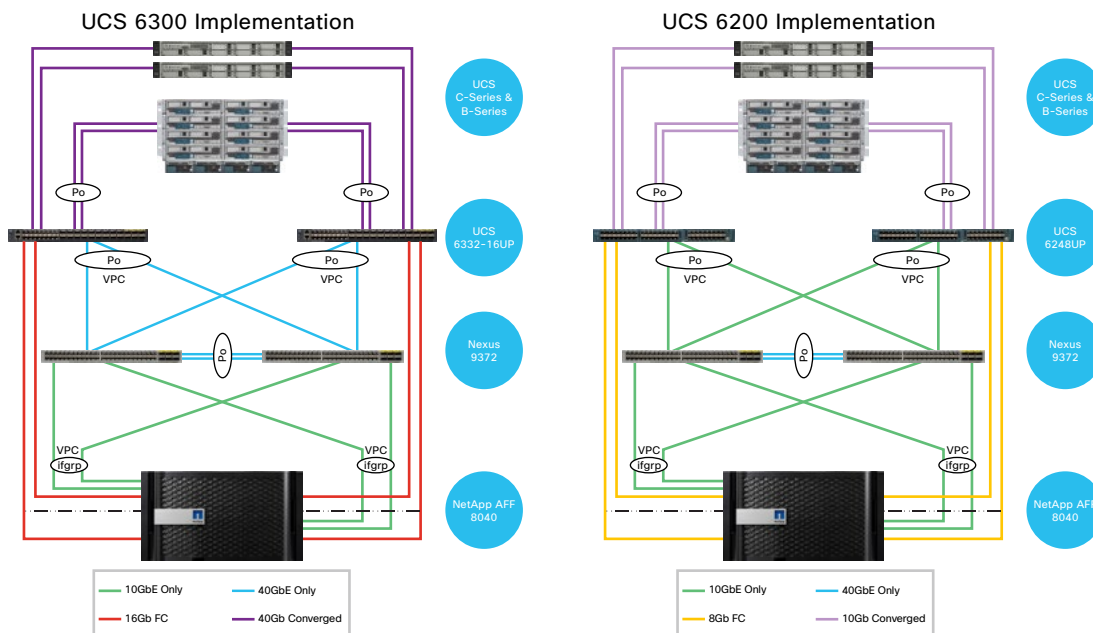
BUSINESS CHALLENGES

- 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





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

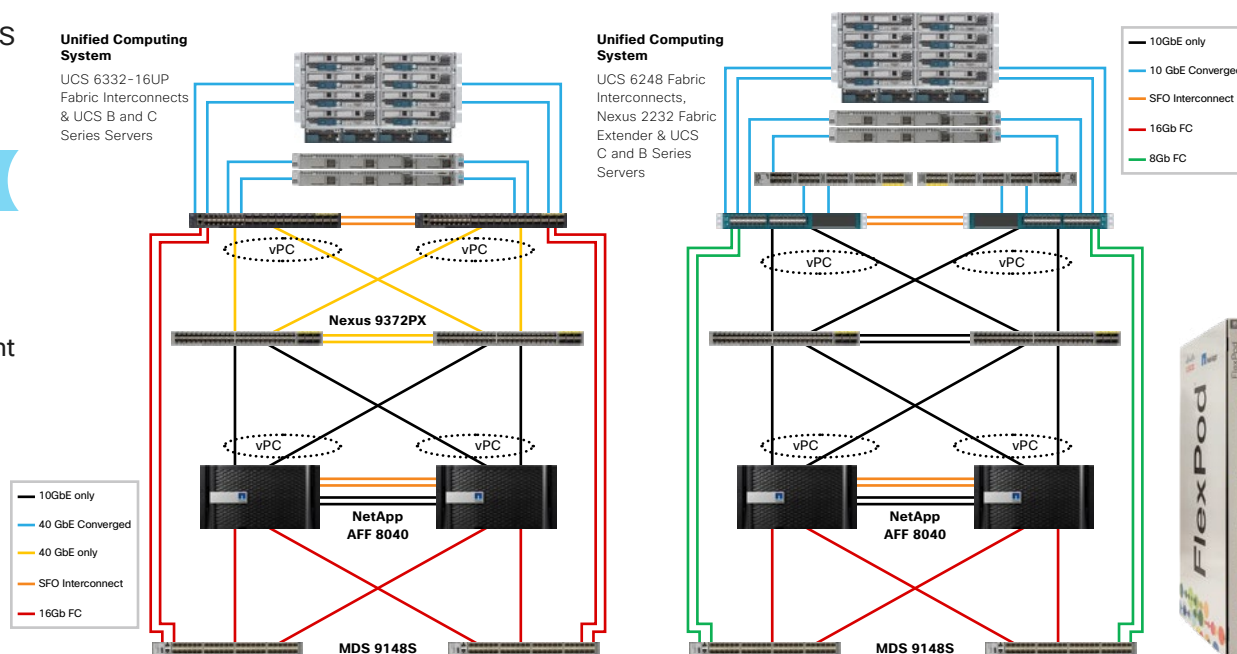
BUSINESS CHALLENGES

- 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



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi60u2_fc.html

Design: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_esxi60u2_fc_design.html

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

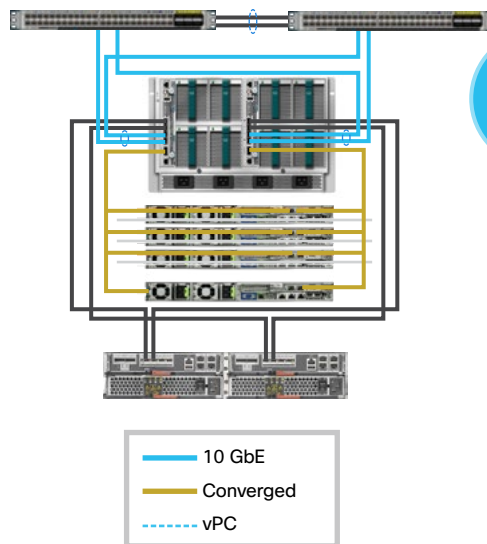


SUMMARY

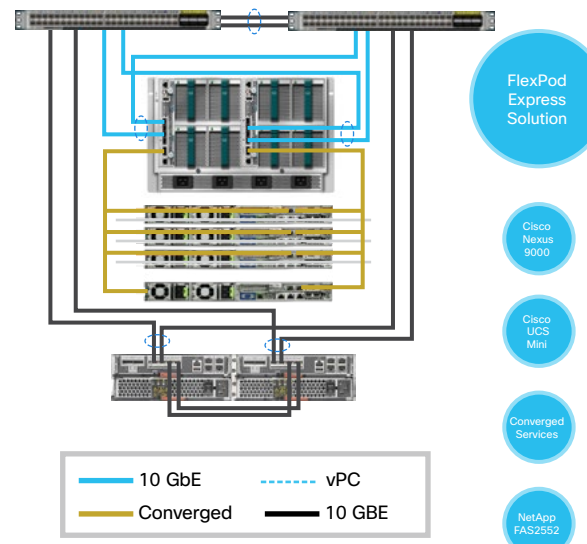
- Consistent management with appropriate scale from the edge of the network to the data center
- FlexPod Data Center for Enterprises and Service Providers with small failure domain requirements
- FlexPod Infrastructure for uses cases including app workloads such as Exchange 2010, VCC, SAP, MS SQL

ARCHITECTURE

Direct Connect IP Solution



IP Based Data Center Solution





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

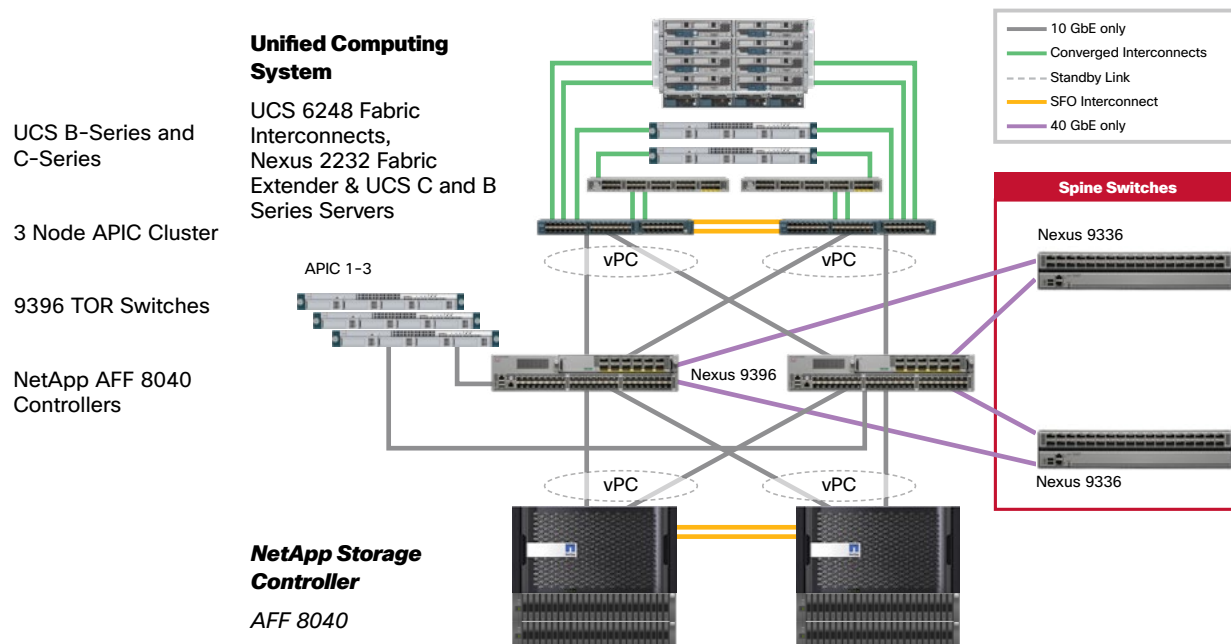
BUSINESS CHALLENGES

- 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





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)

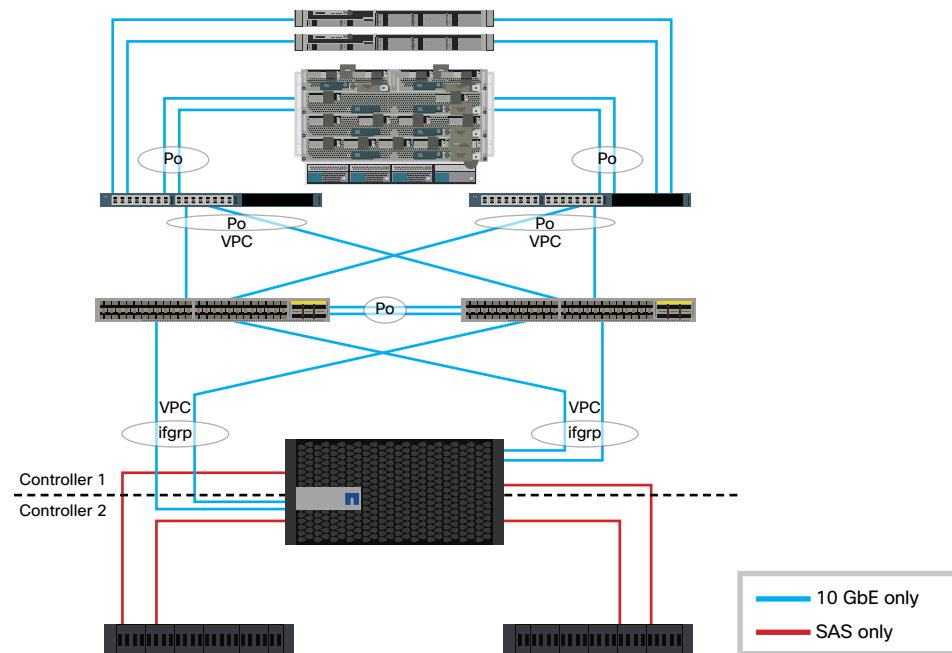
Cisco UCS 5108 B-Series
Blade Chassis 2208XP
Chassis FEX Modules B260
and B460 M4 Blade(s)

Cisco UCS 6248UP
Fabric Interconnects

Cisco Nexus
9372PX Switches

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

NetApp DS2246
Disk Shelves





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

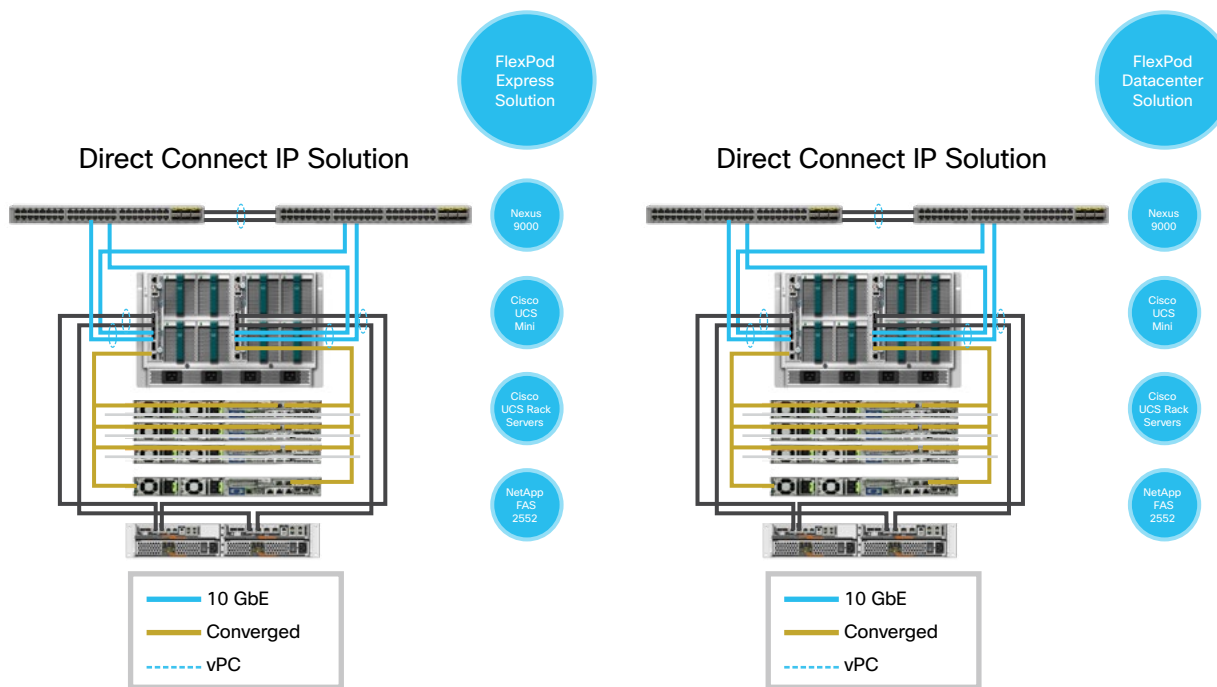
- **Reducing cost:** to reduce the time and money spent on managing servers, storage and applications. This also includes power, space, and cooling
- **Supporting business requirements:** to create a more flexible and agile infrastructure
- **Reducing time-to-market:** to enable rapid deployment of new 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_ucsmi_mini_esxi55_ip.html

CVD Express: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_express_ucsmi_mini_esxi55_ip.html

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





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



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

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)

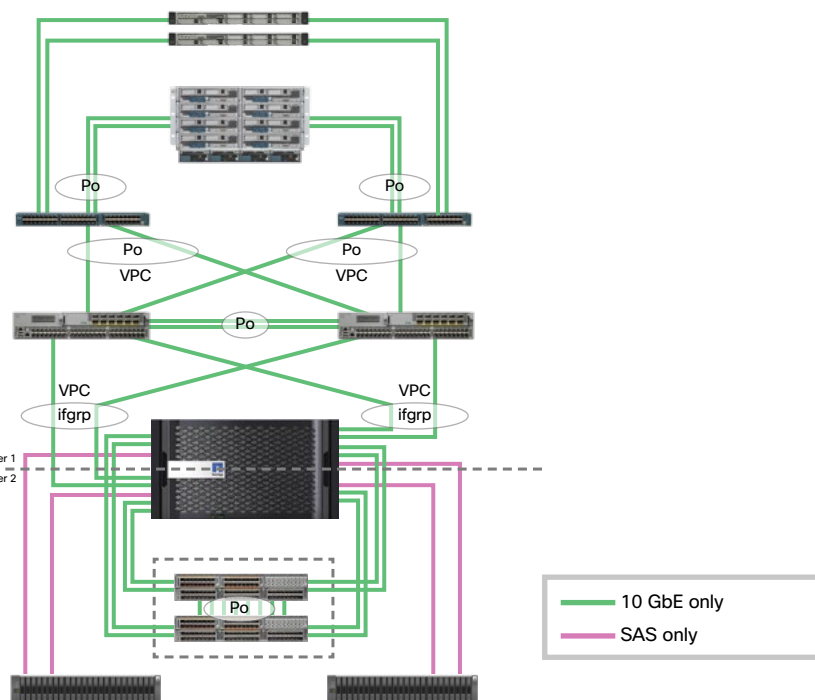
Cisco UCS 6248UP Fabric Interconnects

Cisco Nexus 9396 Switches

NetApp FAS8040 Storage
Controllers w/ High Availability -
Backplane

Cisco Nexus 5596 Cluster
Interconnects

NetApp DS2246 Disk Shelves





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)

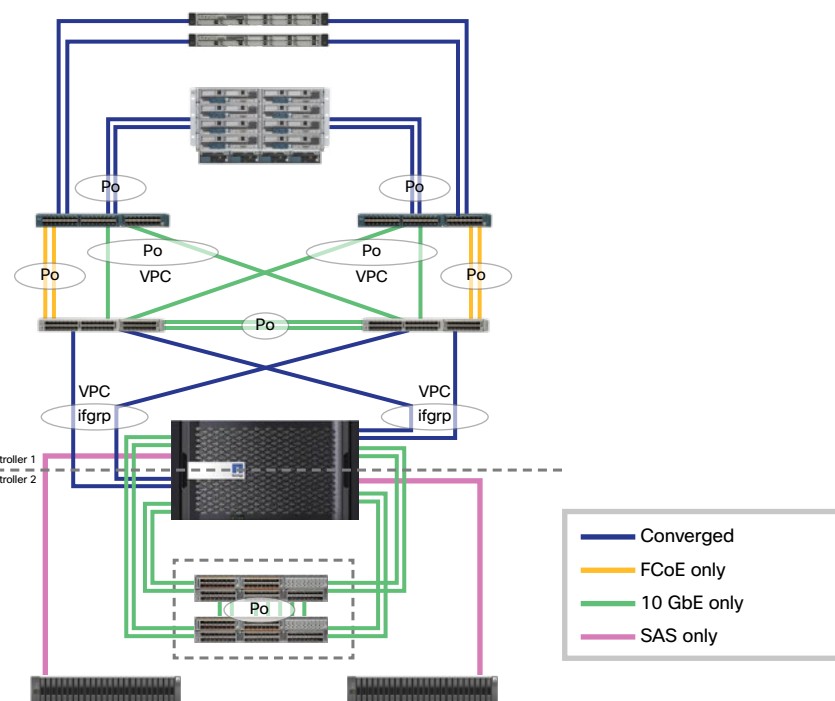
Cisco UCS 6248UP Fabric Interconnects

Cisco Nexus 5548UP or
5672UP Switches

NetApp FAS8040 Storage
Controllers w/ High Availability
Backplane

Cisco Nexus 5596 Cluster
Interconnects

NetApp DS2246 Disk Shelves





Infrastructure | Converged

FLEXPOD

VMware: Applications

- FlexPod with Microsoft Exchange 2013 on Cisco ACI

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 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

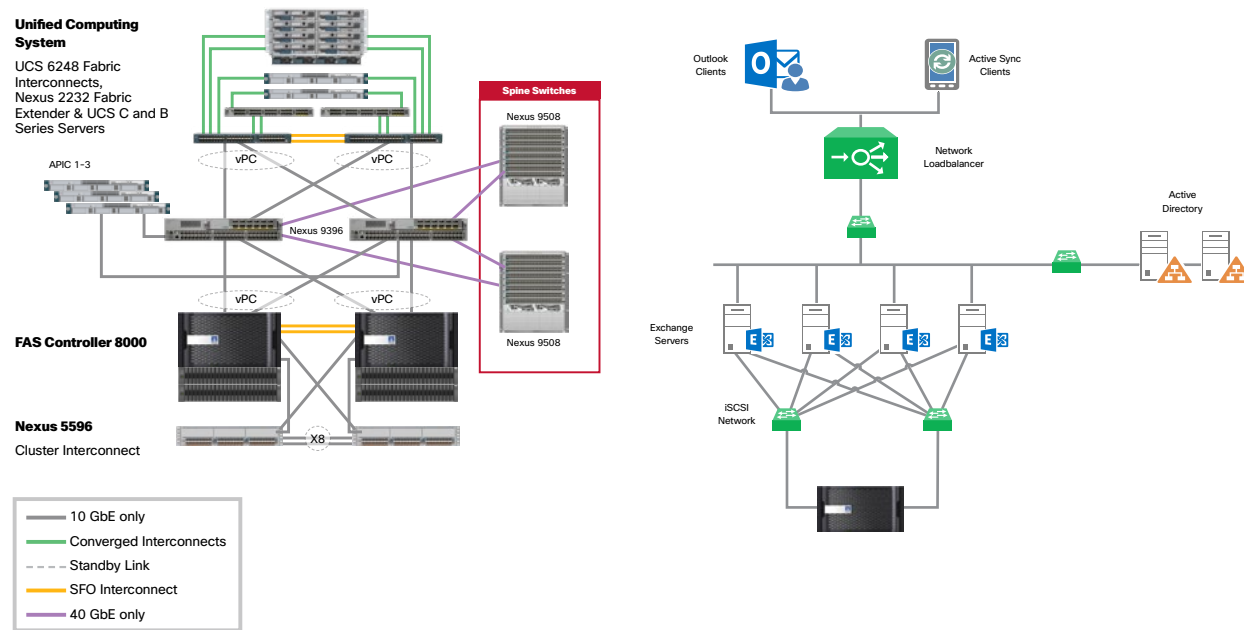
BUSINESS CHALLENGES

- 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





Infrastructure | Converged

FLEXPOD

VMware: Other

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

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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





Infrastructure | Converged

FLEXPOD

Microsoft

- FlexPod Datacenter with Microsoft Windows Hyper-V Server 2016 and Cisco ACI 3.0
- FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5
- FlexPod Datacenter with Microsoft Private Cloud Fast Track 4.0

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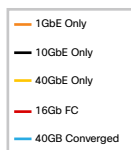
FlexPod Datacenter with Microsoft Windows Hyper-V Server 2016 and Cisco ACI 3.0

TECHNICAL HIGHLIGHTS

- UCS 6300 Fabric Interconnect, Nexus 9000, and NetApp AFF-A300 providing 40 GE end-to-end IP connectivity for CIFS/SMB share for VM store and 16 Gb FC with MDS 9148s for boot LUNs (10 GE and 8 Gb FC with UCS 6200).
- NetApp All Flash FAS (AFF) with clustered ONTAP Data 9.1 delivering 8/16 Gb FC, 10 Gb FCoE Direct Connect and 10/40 Gb NFS storage solutions.
- New FlexPod Data Center Best Practices for Microsoft Hyper-V 2016. with System Center 2016 VMM.

BUSINESS CHALLENGES

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

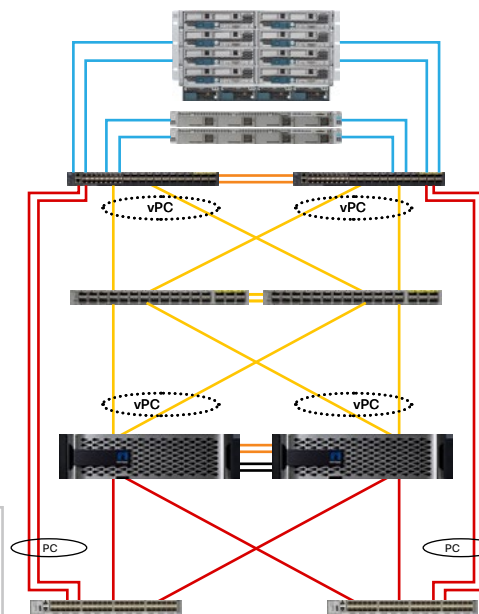


SUMMARY

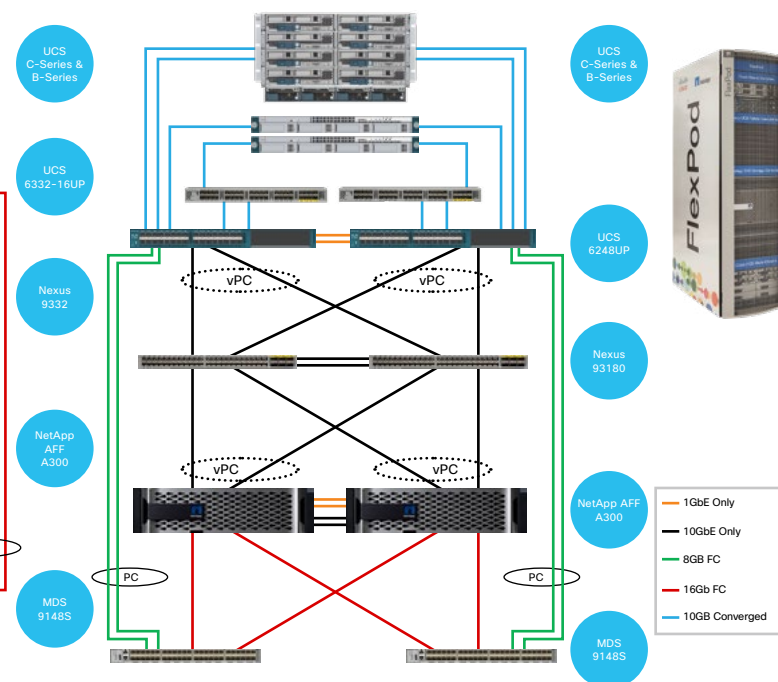
- Converged infrastructure for the NextGen Data Center
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient systems

ARCHITECTURE

UCS 6300 Implementation



UCS 6200 Implementation





FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5

TECHNICAL HIGHLIGHTS

- Scalable Architecture
- 40GE End-to-End iSCSI Connectivity
- NetApp AFF300 Series Storage
- MS SQL Server 2016
- Nexus 9000 Series
- vSphere 6.5 Virtualization Platform
- High Availability with VMware

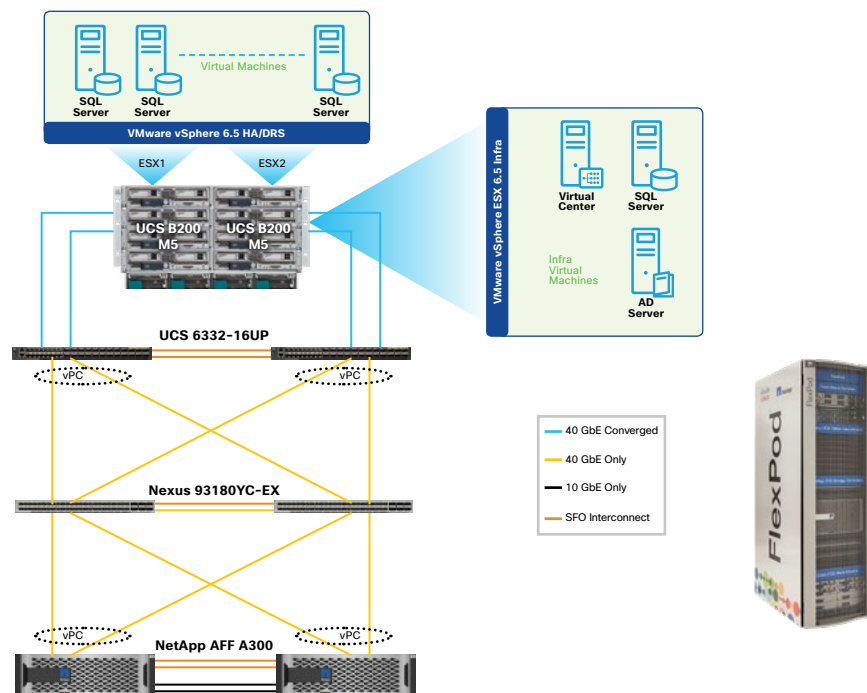
BUSINESS CHALLENGES

- Non-Standardization and decentralization SQL Server Databases
- Slow, complex, expensive SQL application deployments
- Scalability and performance Challenges
- Business Continuity challenges due to growing environment complexity
- Reduce the number of management domains - data center agility

SUMMARY

- To simplify the design and deployment of MS SQL server on a virtualized FlexPod Infrastructure
- Maximize hardware utilization, reducing sprawl, power and cooling costs by consolidation
- Virtualizing SQL server on the FlexPod (All Flash storage) infrastructure meets the most demanding customers' workloads
- UCS "Service Profile" approach helps in deploying servers/solutions quickly & effectively.

ARCHITECTURE





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

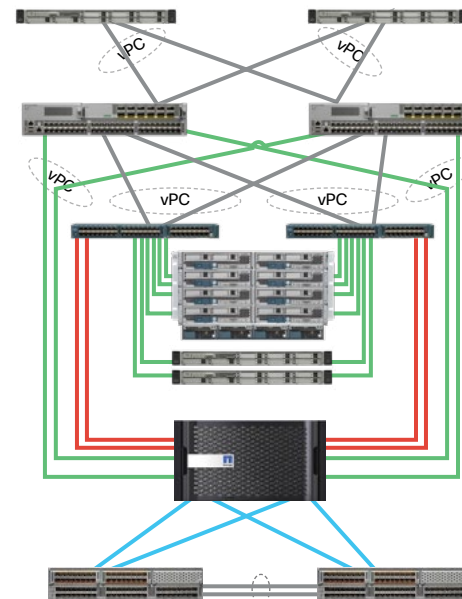
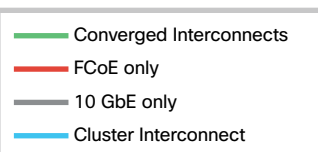
Nexus 1110X

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





Infrastructure | Converged

FLEXPOD

Virtual Client Computing

- FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5 U1 for 5000 Seats
- FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats
- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7

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 Horizon View 7.3 and VMware vSphere 6.5U1 for 5000 Seats

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M5 Chassis
- 5,000 Mixed RDSH & VDI users Instant and Full Clone combined and Infrastructure Servers in four 5108 Blade Server Chassis
- 5000 Combined RDS Hosted Server Sessions & VDI users, Cisco Hardware, 3rd Gen 6300 , 40GBE Fls, Nexus Switches, 9148S MDS Switch 16 Gb FC, NetApp AFF A300 Storage System in 42 RU single rack solution
- Performance study with simulations of RDS Hosted Server Sessions & VDI Instant non-persistent Clones & Full Clone persistent desktop workloads running knowledge worker workload

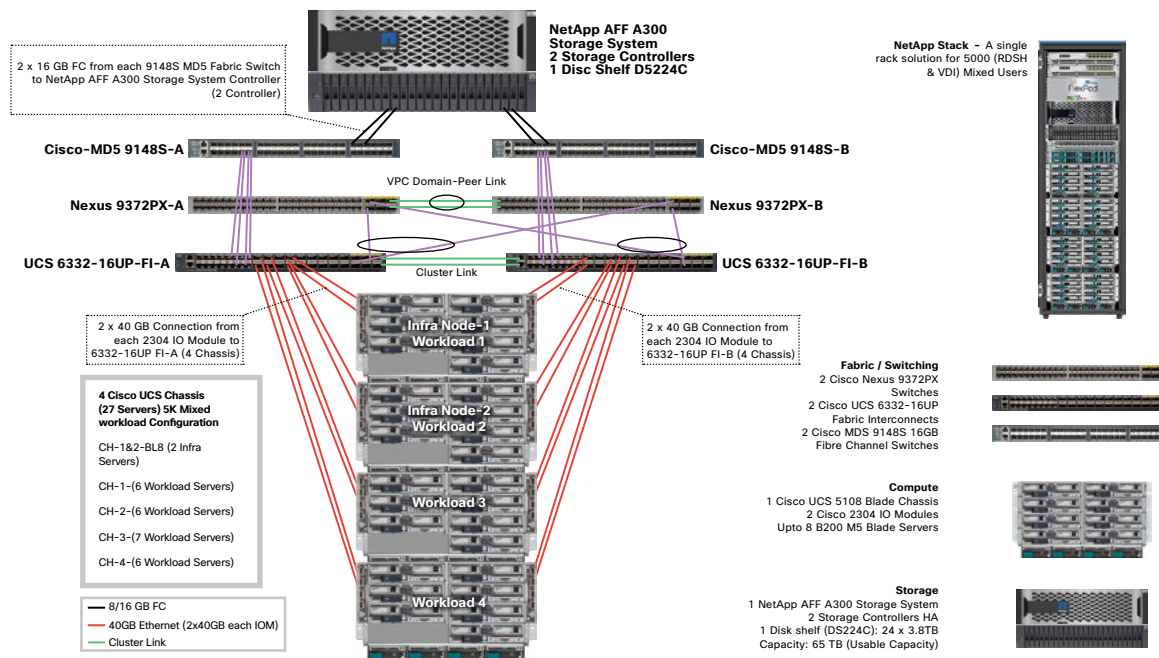
BUSINESS CHALLENGES

- Typical VMware Horizon 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 RDSH & VDI solutions
- Different VDI end users (Non Persistent & Persistent and RDSH Server Sessions Users) connecting to newer/variety of end point devices

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 & VDI Users on cluster level and 5000 users mixed workload level
- FlexPod all flash storage technology delivering 16 GB FC/ 10 GB FCoE/ 10/40 GB NFS
- Converged Infrastructure for the NextGen Data Center

ARCHITECTURE



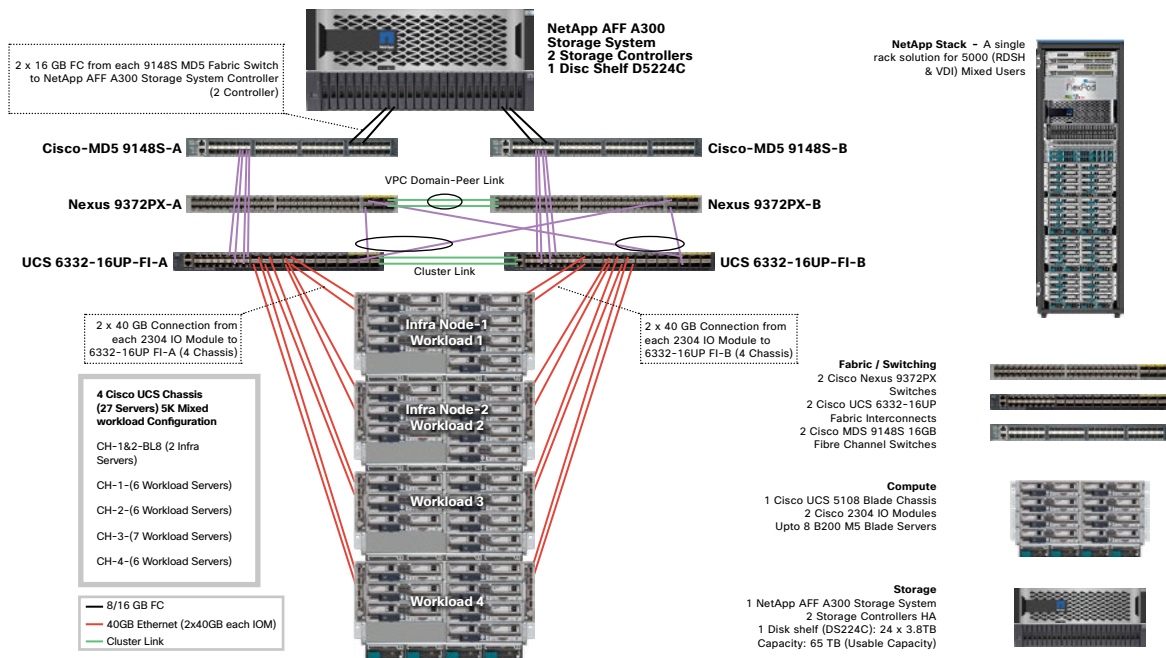


FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats

TECHNICAL HIGHLIGHTS SUMMARY

- Scalable architecture with UCS B200 M5 Chassis
- 5,000 Mixed RDSH & VDI users Instant and Full Clone combined and Infrastructure Servers in four 5108 Blade Server Chassis
- 5000 Combined RDS Hosted Server Sessions & VDI users, Cisco Hardware, 3rd Gen 6300 , 40GBE FIs, Nexus Switches, 9148S MDS Switch 16 Gb FC, NetApp AFF A300 Storage System in 42 RU single rack solution
- Performance study with simulations of RDS Hosted Server Sessions & VDI Instant non-persistent Clones & Full Clone persistent desktop workloads running knowledge worker workload
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- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Very good end user experience measuring <1 second for both RDSH & VDI Users on cluster level and 5000 users mixed workload level
- FlexPod all flash storage technology delivering 16 GB FC/ 10 GB FCoE/ 10/40 GB NFS
- Converged Infrastructure for the NextGen Data Center

ARCHITECTURE



BUSINESS CHALLENGES

- Typical VMware Horizon 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 RDSH & VDI solutions
- Different VDI end users (Non Persistent & Persistent and RDSH Server Sessions Users) connecting to newer/variety of end point devises





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

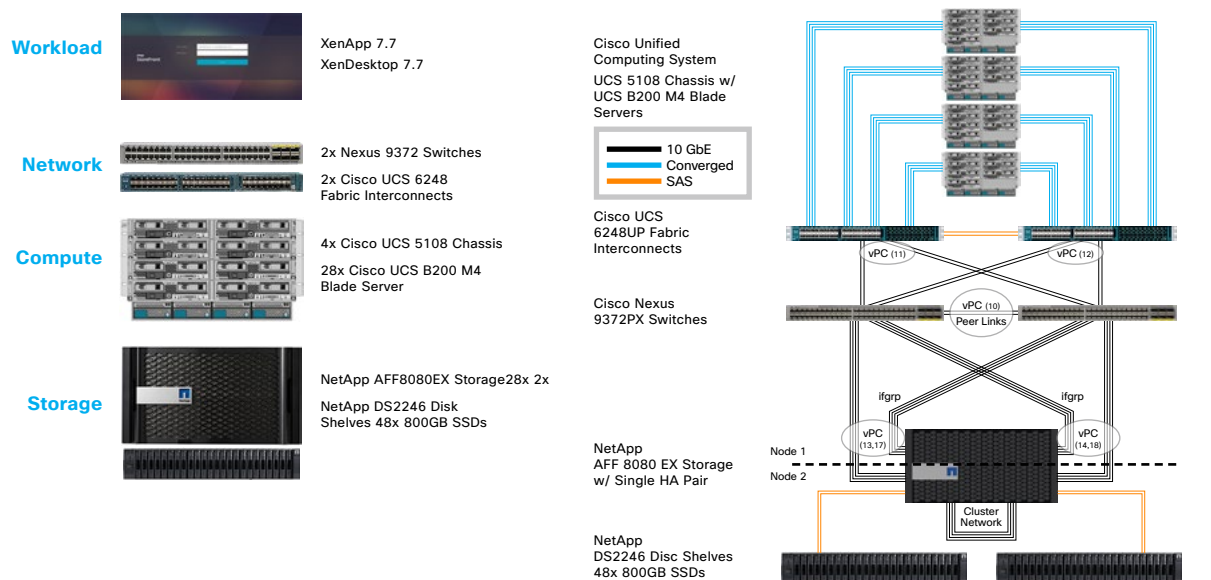
BUSINESS CHALLENGES

- 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





Infrastructure | Converged

FLEXPOD

Applications

- FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series - **New**
- FlexPod Datacenter for SAP Solution with Cisco UCS Manager 3.2 and Cisco ACI
- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series
- FlexPod with Microsoft Exchange 2013 on Cisco ACI

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FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series

TECHNICAL HIGHLIGHTS

- Cisco UCS 3.2(3c), Cisco UCS B200 M5 Blade Servers and NetApp AFF A700s with Oracle 12cR2 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 All Flash Array powered by NetApp Clustered Data ONTAP 9.3 and Cisco UCS running OLTP and DSS Databases together

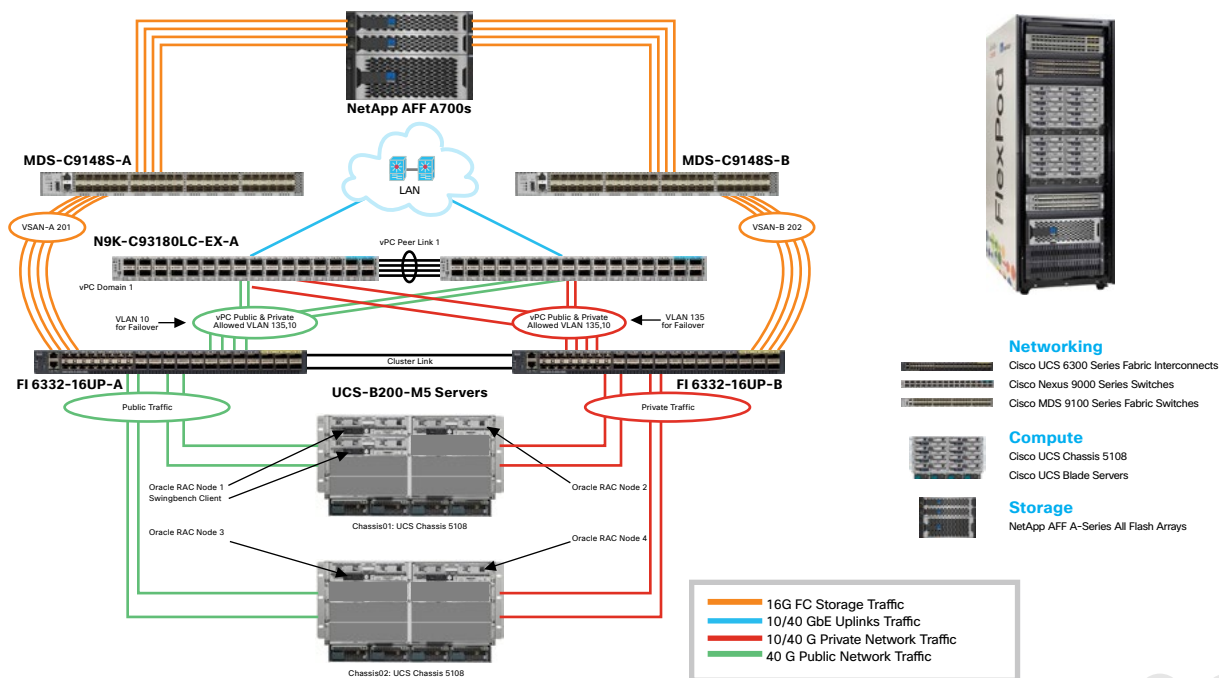
SUMMARY

- Integrated compute, network & storage solution
- High-performance, scalable, and resilient system
- 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
- Faster deployments, greater flexibility of choice, efficiency, high availability and lower risk

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 databases
- Oracle RAC must exude the highest level of flexibility, performance, scalability and resilience
- Time consuming, convoluted, expensive application deployment

ARCHITECTURE



- Networking**
- Cisco UCS 6300 Series Fabric Interconnects
 - Cisco Nexus 9000 Series Switches
 - Cisco MDS 9100 Series Fabric Switches
- Compute**
- Cisco UCS Chassis 5108
 - Cisco UCS Blade Servers
- Storage**
- NetApp AFF A-Series All Flash Arrays





FlexPod Datacenter for SAP Solution with Cisco UCS Manager 3.2 and Cisco ACI

TECHNICAL HIGHLIGHTS

- Cisco UCS 6332 Fabric Interconnects running UCSM 3.2 , Cisco Nexus 9000 series ACI switches with 3-node APIC cluster 3.2(2l)
- NetApp AFF-A300 providing 40 GE end-to-end IP connectivity with NFS and iSCSI options for boot as well as HANA persistence layer.
- SAP HANA single host and scale-out implementation examples.

BUSINESS CHALLENGES

- Reduce time to deployment of business critical applications like SAP HANA
- Ease infrastructure deployment and management burdens
- Industry trends of management automation and dynamic workload provisioning

SUMMARY

- Converged infrastructure for the NextGen Data Center with FlexPod and Application driven policy based approach to Solution deployment with Cisco ACI.
- High performance, scalable and resilient and multi-tenant network infrastructure centrally managed and configured.

ARCHITECTURE

Cisco UCS
5108 B-Series Blade Chassis
2304 Chassis FEX Modules
B480 M5 Blade Servers

Cisco UCS
5108 B-Series Blade Chassis
2304 Chassis FEX Modules
B200 M5 Blade Servers

Cisco UCS C480 M5
Rack Server(s)

Cisco UCS C240 M5
Rack Server(s)

Cisco UCS C220 M5
Rack Server(s)

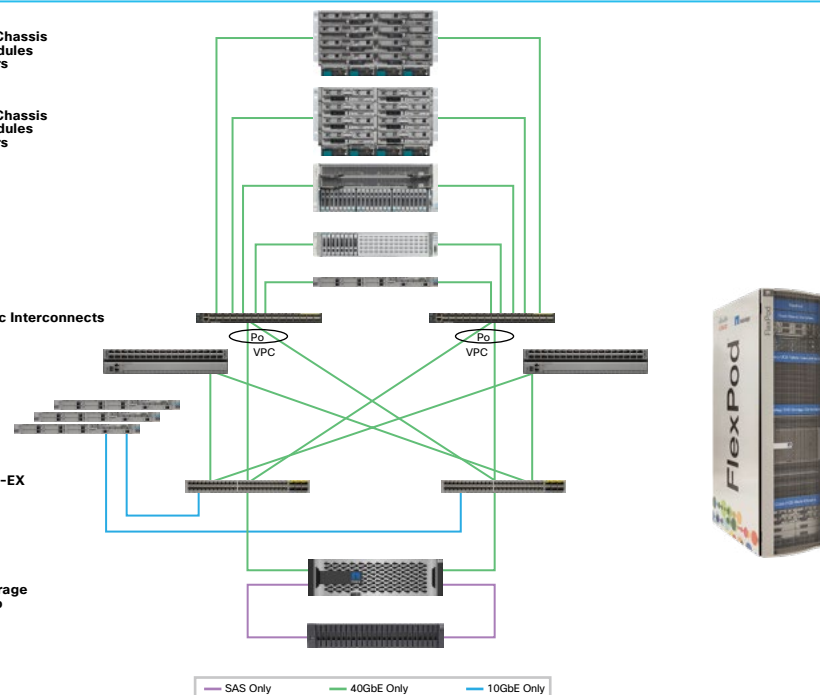
Cisco UCS 6332 Fabric Interconnects

Cisco Nexus 9336PQ
Spine Switches

Cisco ACI APIC
Controllers

Cisco Nexus 93180LC-EX
Leaf Switches

NetApp AFF A300 Storage
Controllers w/ NetApp
DS224C Disc Shelves





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

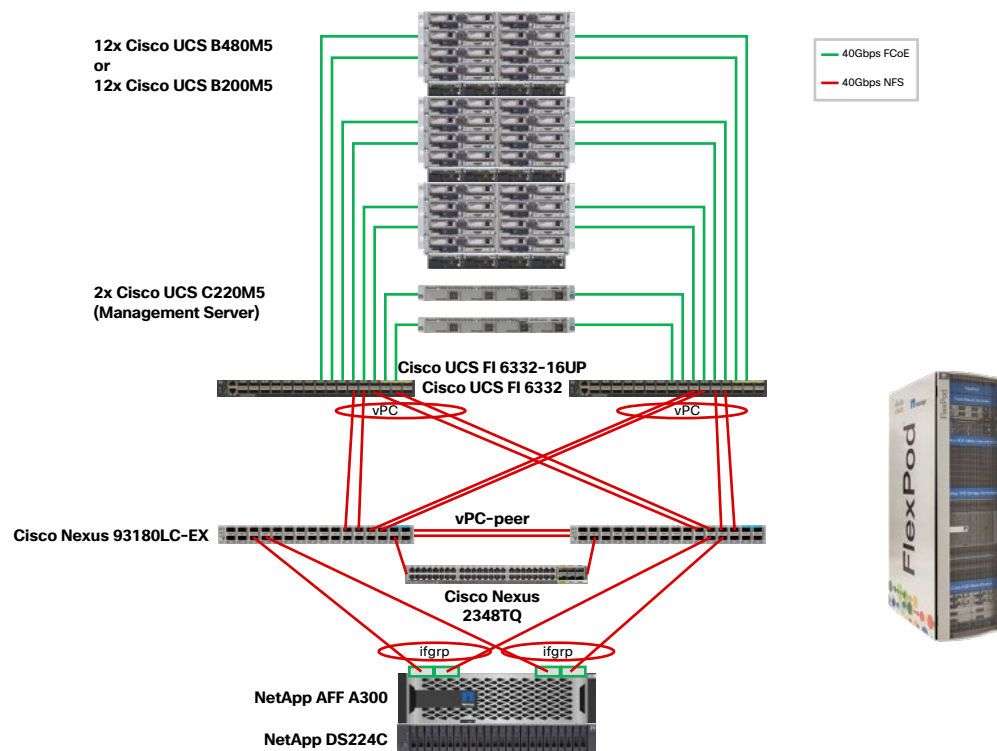
BUSINESS CHALLENGES

- 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





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 5.1 virtualization platform
- Microsoft Exchange 2013

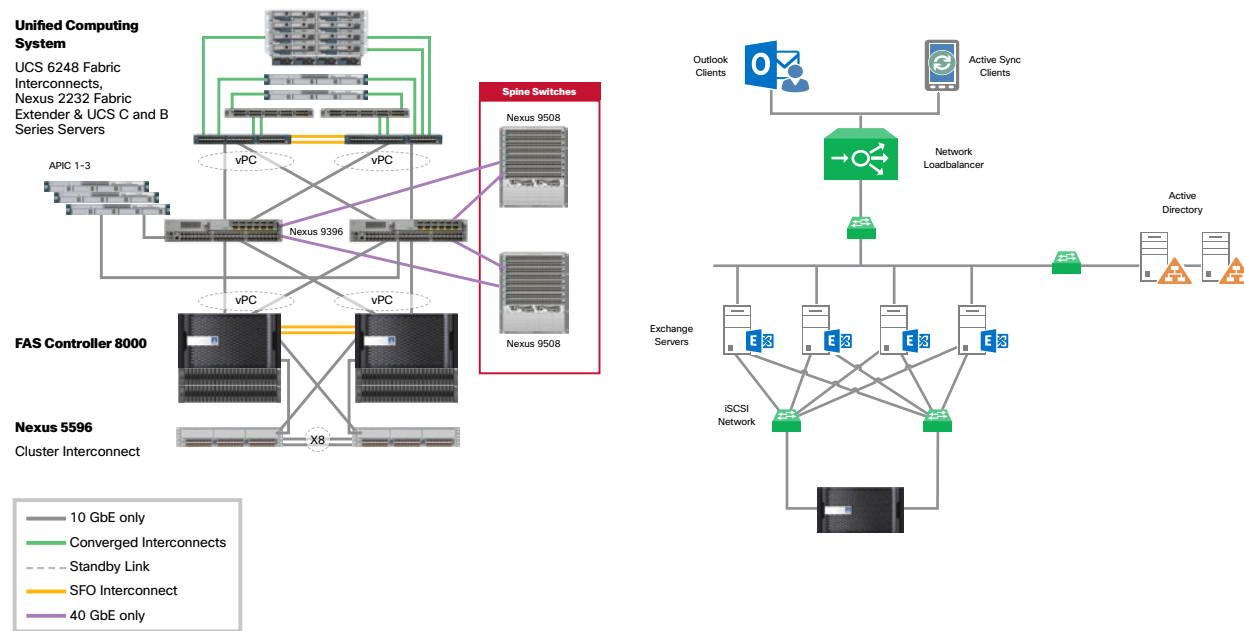
BUSINESS CHALLENGES

- 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





Infrastructure | Converged

FLEXPOD

Other

- FlexPod Datacenter for Hybrid Cloud with Cisco CloudCenter and NetApp Private Storage
- FlexPod Datacenter with Oracle RAC on Oracle Linux
- 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.

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



SUMMARY

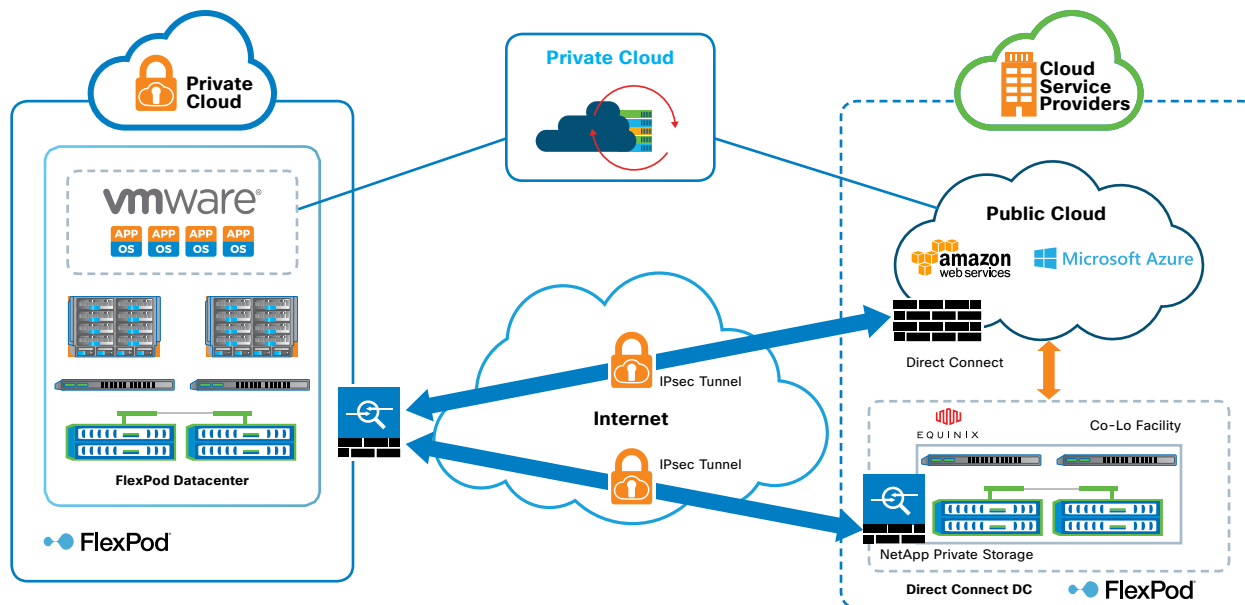
- Secure, high-performance integration between FlexPod and leading cloud providers
- Multi-cloud App deployment with automated data provisioning
- Utilize the resources in public clouds while maintaining control of critical customer data
- Seamless data mobility between on premise NetApp storage and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



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

ARCHITECTURE





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

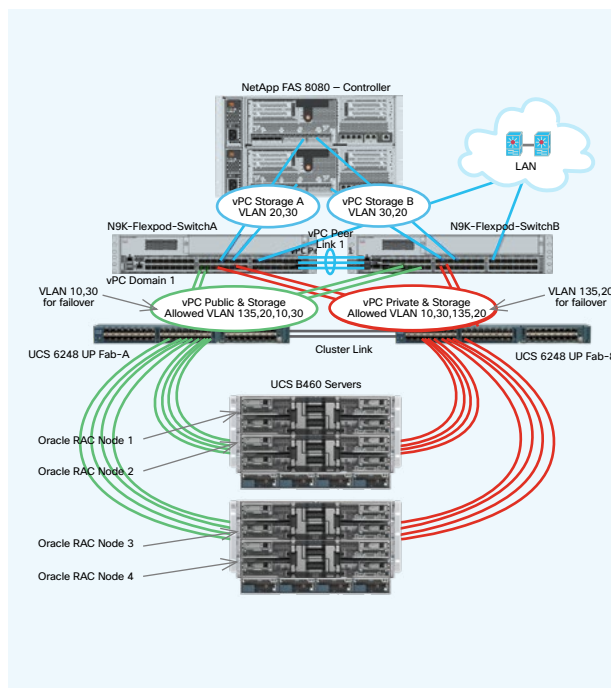
BUSINESS CHALLENGES

- 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





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

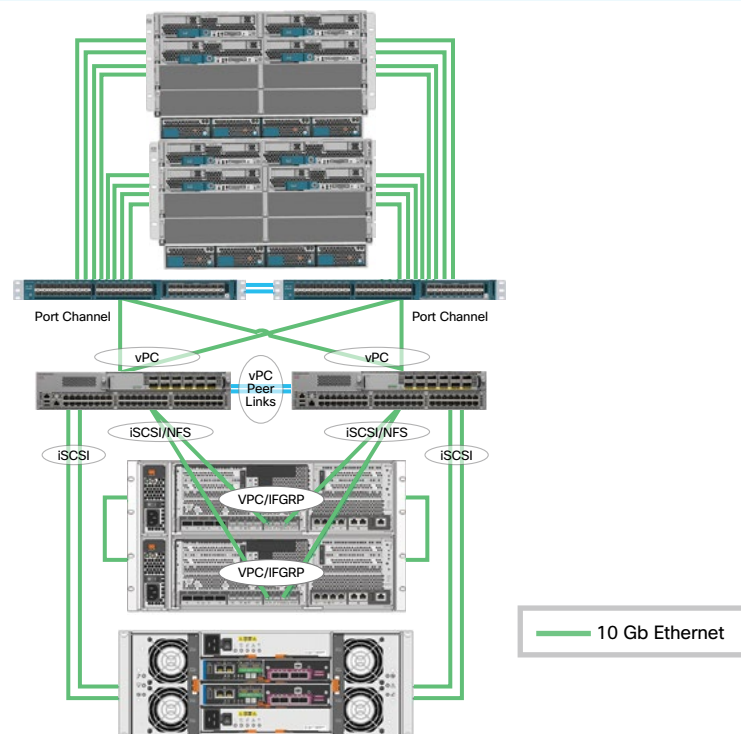
Cisco Nexus 9372PX

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





Infrastructure | Converged

VERSASTACK

- VersaStack for IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode - **New**
- VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage
- VersaStack with Cisco UCS M5 Servers, IBM SVC, and vSphere 6.5 U1
- Cisco UCS S3260 Storage Server with IBM Cloud Object Storage
- VersaStack for Hybrid Cloud with Cisco CloudCenter and IBM Spectrum Copy Data Management Solution
- 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

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 IBM Cloud Object Storage on Cisco UCS C240 for Concentrated Dispersal Mode

TECHNICAL HIGHLIGHTS

- End to end 40G capable UCS Architecture delivers scalable infrastructure starting with just three C240 M5 nodes.
- 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

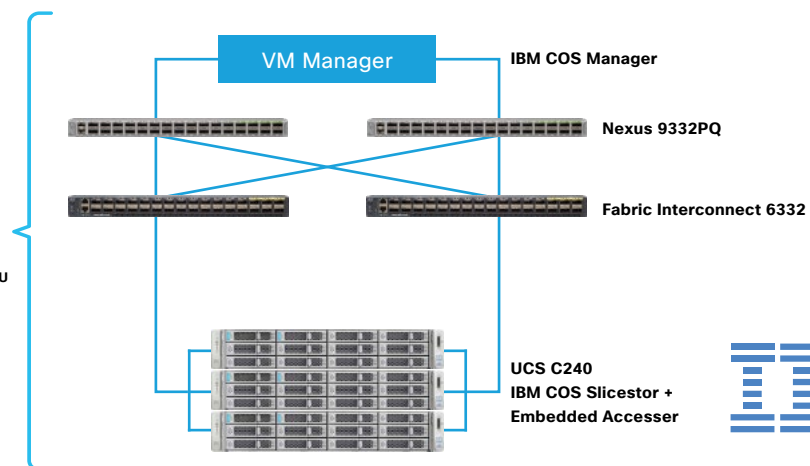
- Enterprises today struggle to use scale-out storage solutions to start small and grow as needed.
- 70% of IT decision maker believe that their current storage systems will not be able to handle the growth of unstructured data.
- Inadequate storage infrastructure is considered to be a significant pain 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 Nexus 9332
- 2 x 6332 Fabric Interconnects
- Full Deployment UCS Managed
- 40 GbE end-to-end
- Starting low with 72 TB usable - 6RU





VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage

TECHNICAL HIGHLIGHTS

- VersaStack with Cisco UCS M5 and IBM Storage for IBM Private Cloud.
- IBM Cloud Private 2.1.0 Enterprise Edition
- IBM Spectrum Connect 3.4.0
- IBM Storage Enabler for Containers 1.0
- VMware vSphere 6.5 U1

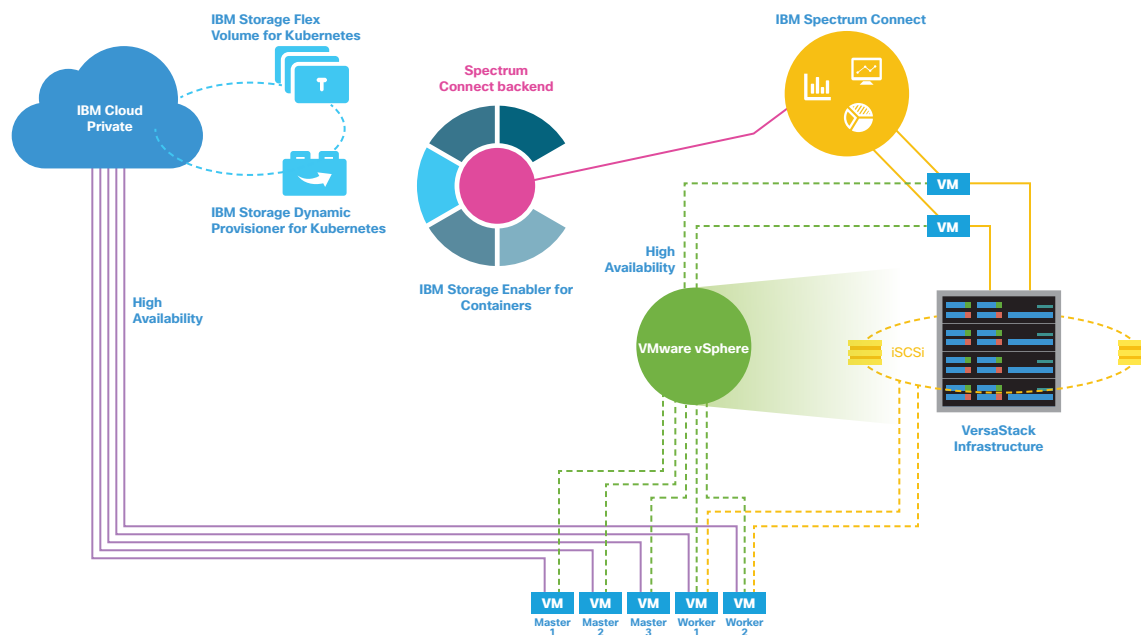
SUMMARY

- Enterprise grade highly available and secure Infrastructure with VersaStack
- Persistent storage for application containers
- Multi-tenant containers and orchestration that is based on Kubernetes for creating microservices-based applications
- A common catalog of enterprise and open services to accelerate developer productivity
- Automatic horizontal and non-disruptive vertical scaling of applications

BUSINESS CHALLENGES

- **Operational complexity:** Ability to deploy and run cloud native microservices-based applications on-premises.
- **Compliance and management:** Simplicity, ease of deployment and compliance requirements to keep applications and data secure with in enterprise's control.
- **Investment leverage:** Ability to leverage existing investments across both middleware and infrastructure.

ARCHITECTURE





VersaStack with Cisco UCS M5 Servers, IBM SVC, and vSphere 6.5 U1

TECHNICAL HIGHLIGHTS

- UCS 6300 series Fabric interconnect and M5 blade support
- Detailed instructions on deploying VersaStack in Fibre Channel & iSCSI environments leveraging IBM SVC. Implementation leverages Cisco 9k 40G network and MDS 9396S 16G fabric switches
- VMware vSphere 6.5 U1

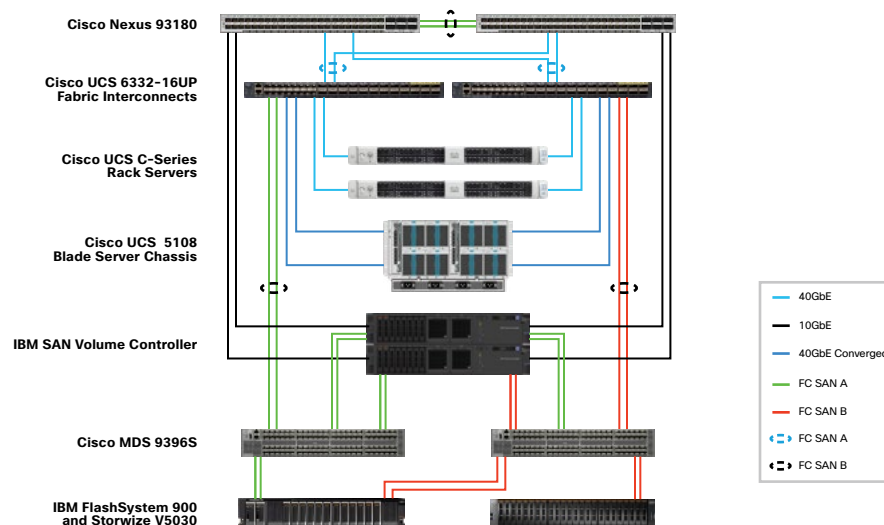
BUSINESS CHALLENGES

- 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





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



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

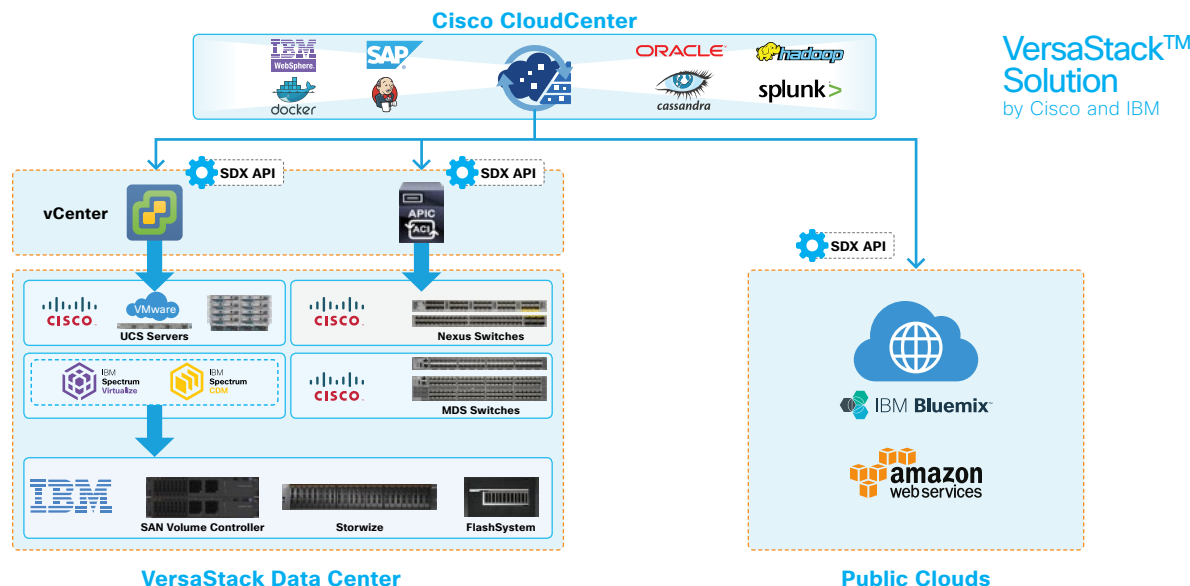
SUMMARY

- “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

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

ARCHITECTURE





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

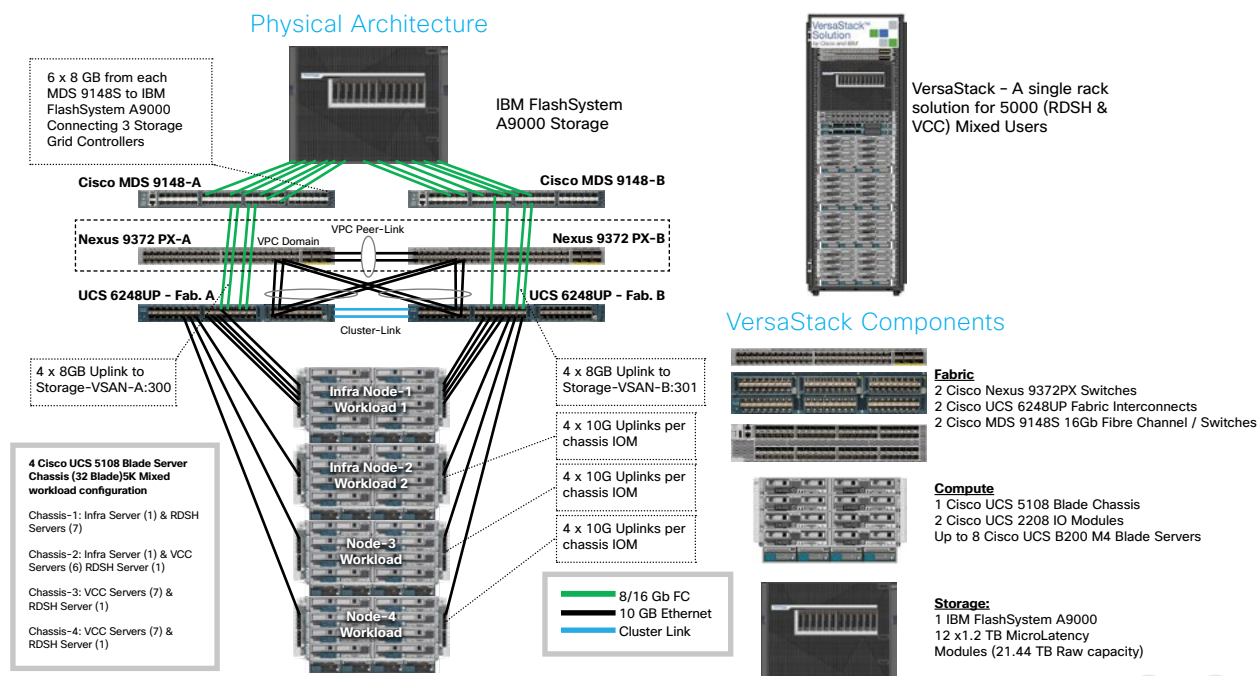
BUSINESS CHALLENGES

- 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





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

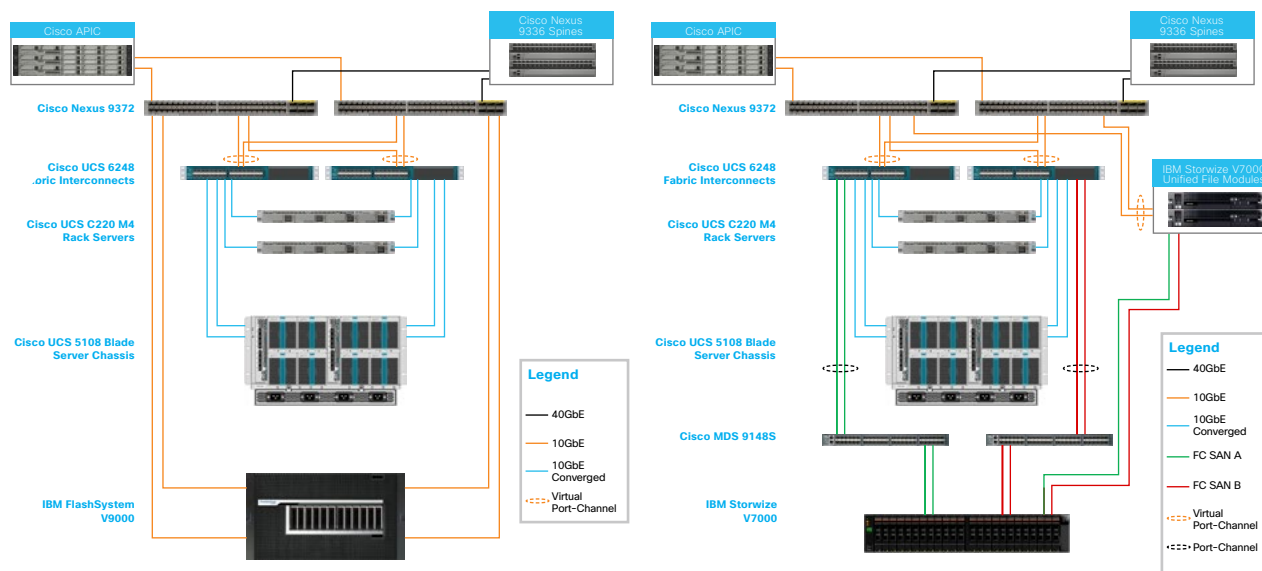
BUSINESS CHALLENGES

- 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





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



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

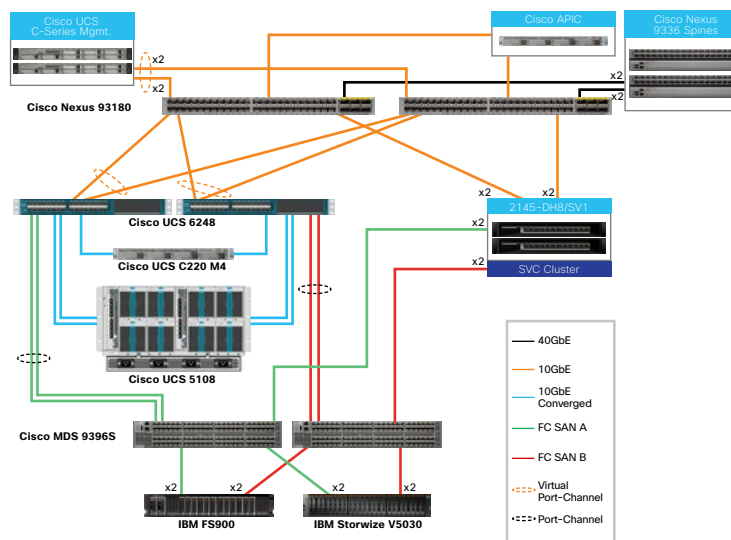
ARCHITECTURE



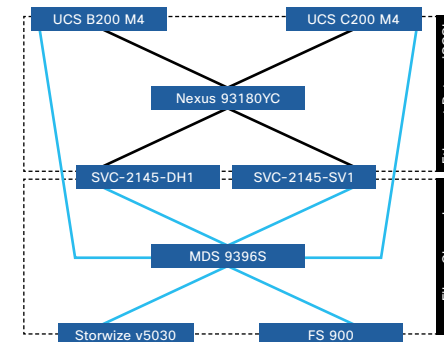
BUSINESS CHALLENGES

- 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

Physical Layout



Logical Design





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

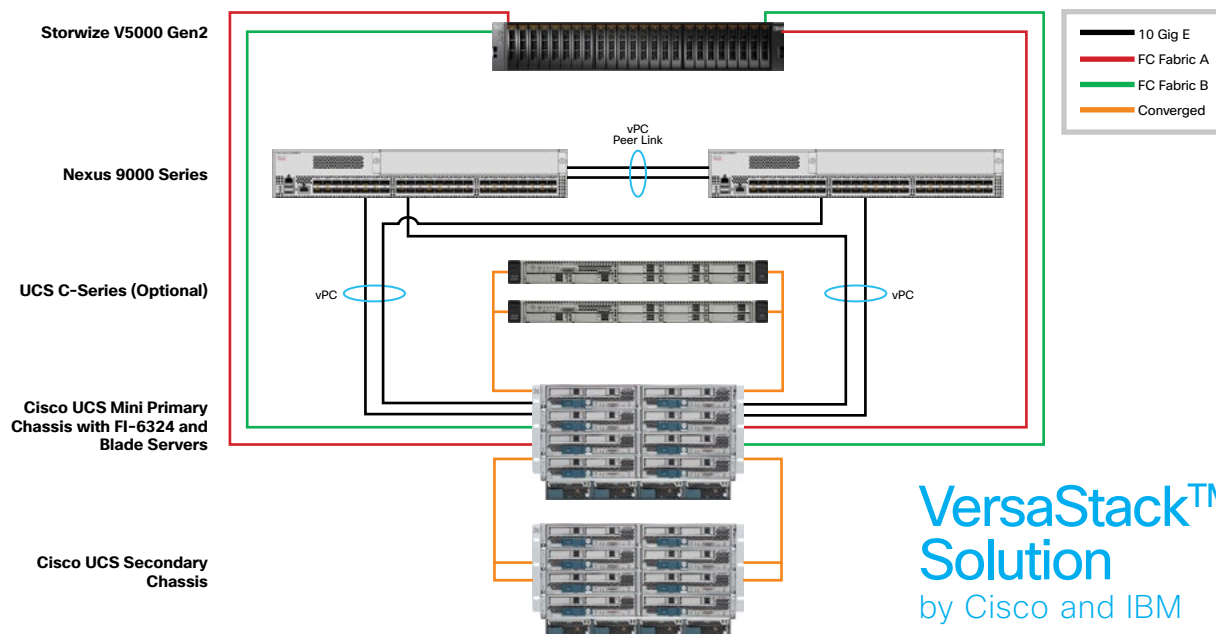
BUSINESS CHALLENGES

- **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





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

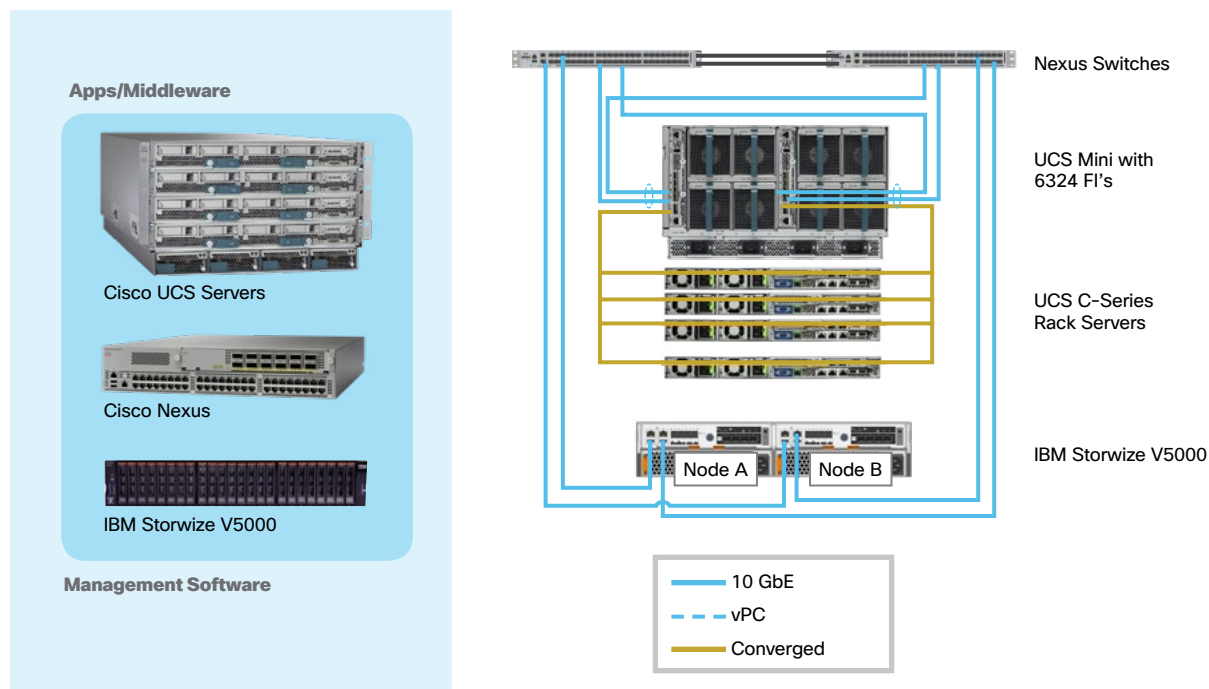
BUSINESS CHALLENGES

- **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





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

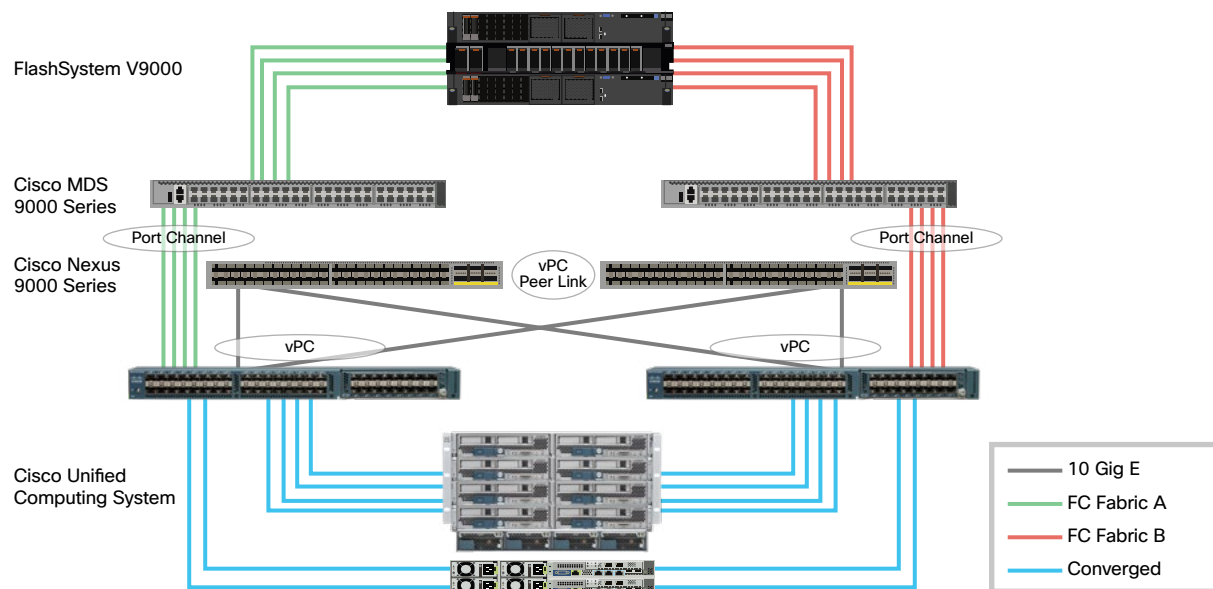
BUSINESS CHALLENGES

- 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





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

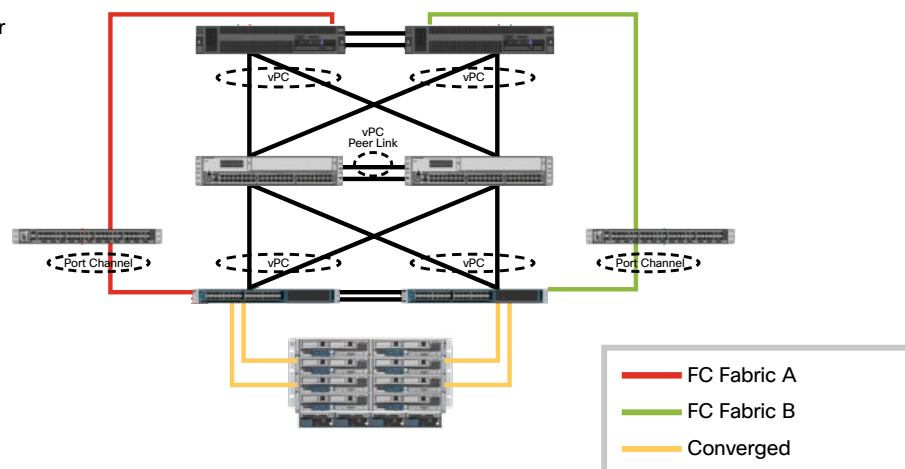
Storwize V7000 Controller

IBM Storwize V7000 File Modules

Cisco Nexus 9000 Series

Cisco MDS 9000 Series

Cisco Unified Computing System





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

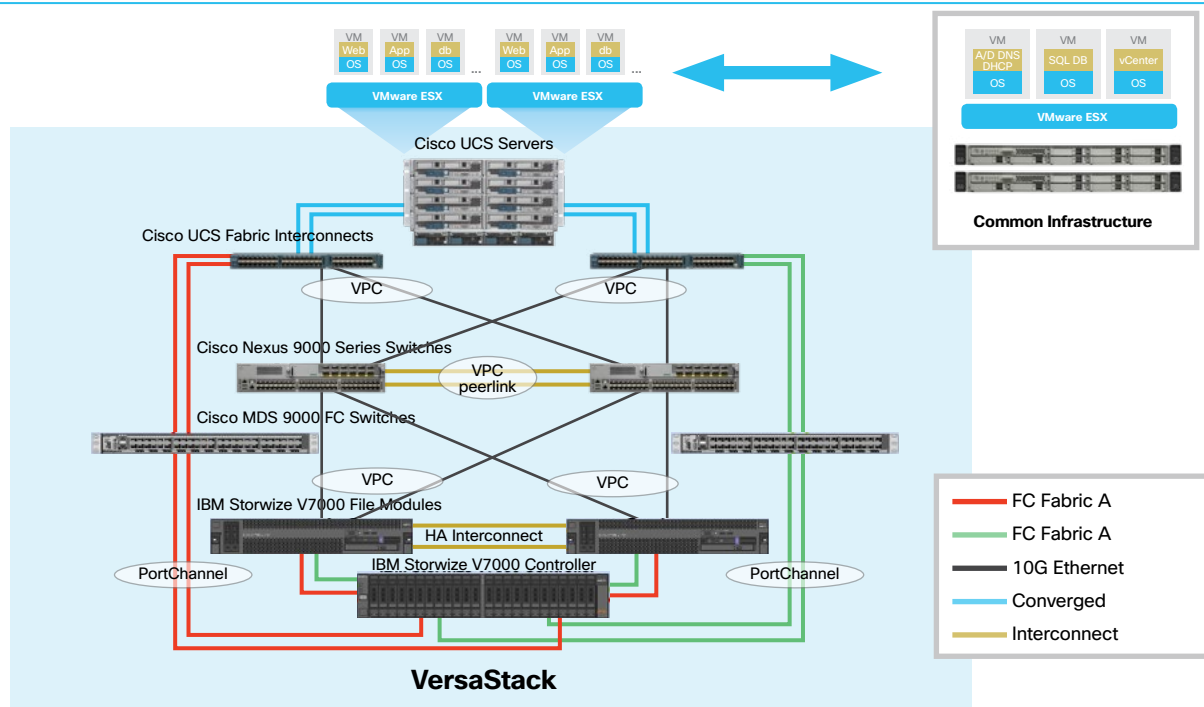
BUSINESS CHALLENGES

- 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





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

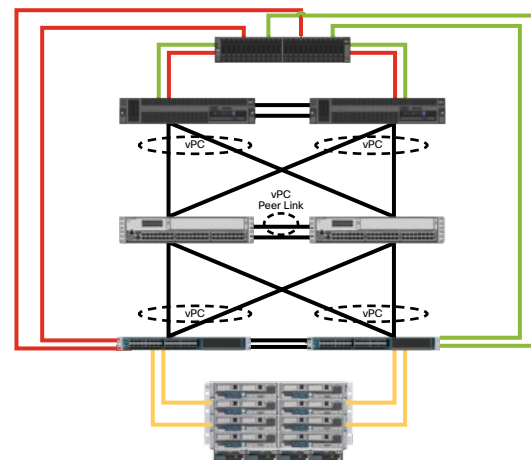
Storwize V7000 Controller

IBM Storwize V7000 File Modules

Cisco UCS 6248UP Fabric Interconnects

UCS5108 B-Series Blade Chassis

B200 M3 and M4 B-Series Blade(s)



— FC Fabric A
— FC Fabric B
— Converged





Infrastructure | Converged

OPENSTACK

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

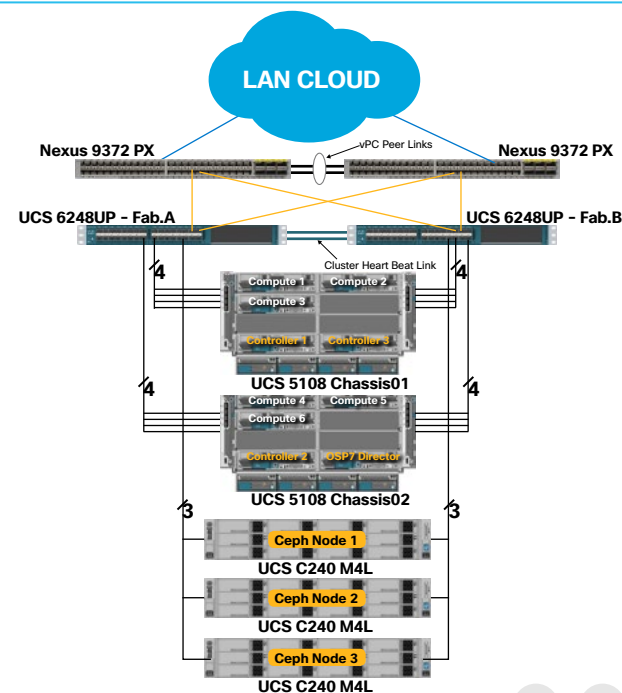
SUMMARY

- 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





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

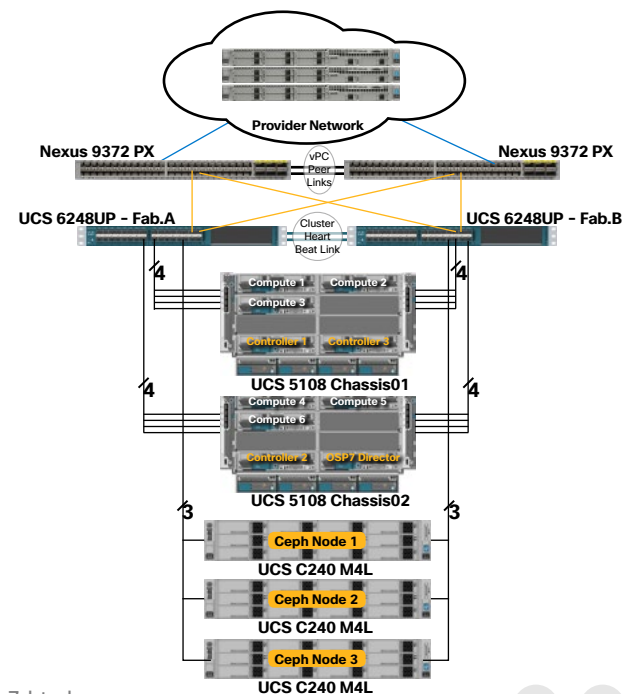
ARCHITECTURE



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

Cisco UCS, OSP, CEPH Kilo



CVD: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_openstack_osp7.html

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

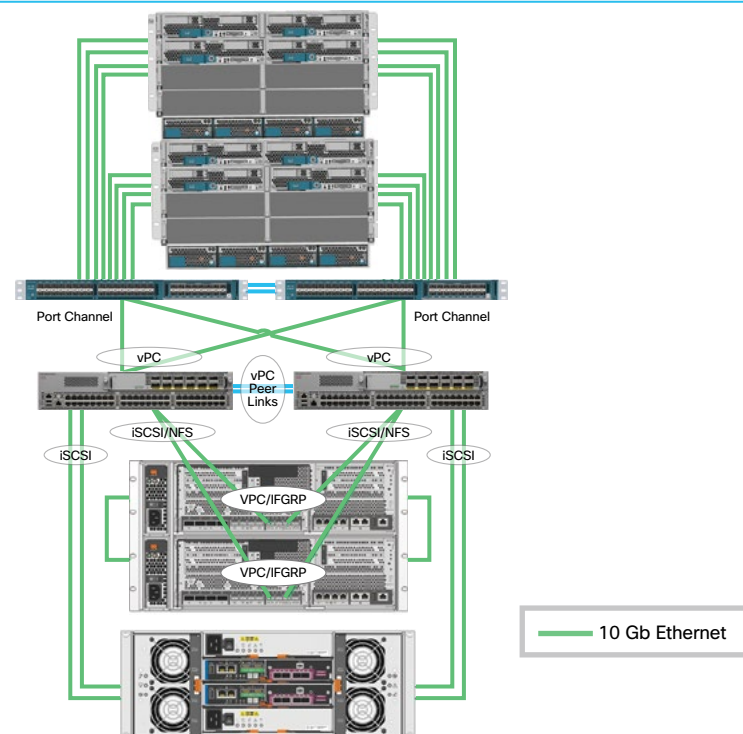
Cisco Nexus 9372PX

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





Infrastructure | Converged

FLASHSTACK

- FlashStack Datacenter with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats - **New**
- FlashStack for SAP HANA TDI - **New**
- FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade
- FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats
- FlashStack Virtual Server Infrastructure with Cisco ACI Multi-pod and Pure Storage ActiveCluster
- 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15
- FlashStack Data Center with Oracle RAC 12cR2 Database
- 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.



FlashStack Datacenter with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats

TECHNICAL HIGHLIGHTS

- 30 UCS B200 M5 Blade Servers, (n+1) with scale out option in a single UCS domain
- Cisco UCSM 3.2(2f)
- VMware Horizon 7.4
- VMware vSphere 6.5 U1
- Pure Storage FlashArray // X70 with All-NVMe DirectFlash Modules
- Purity v5.0.2

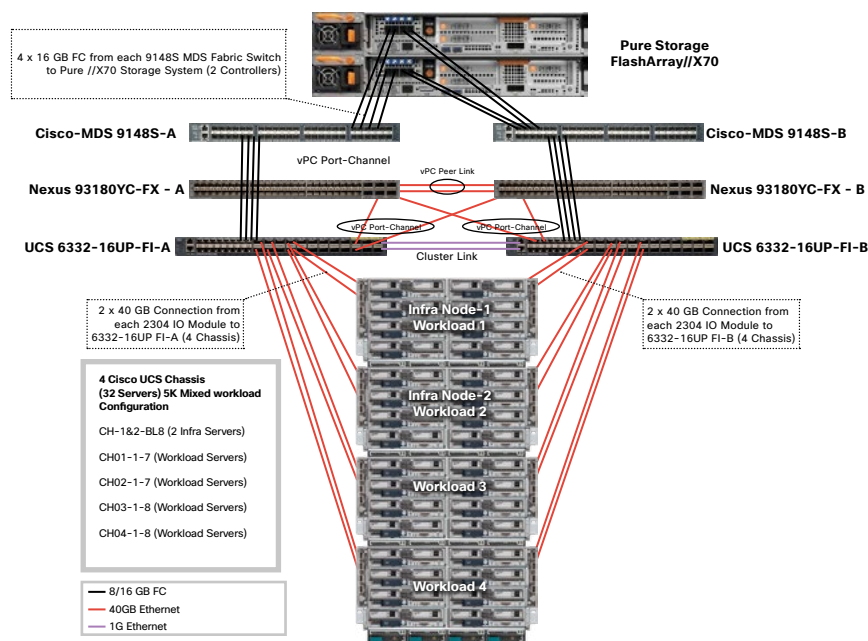
BUSINESS CHALLENGES

- 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 VDI and RDSH solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- Very good end user experience on cluster level and 6000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability
- Investment protection in high density and high performance data center environments

ARCHITECTURE





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 with newer Purity RUN platform enabled WFS based NFS services providing for HANA shared filesystem.

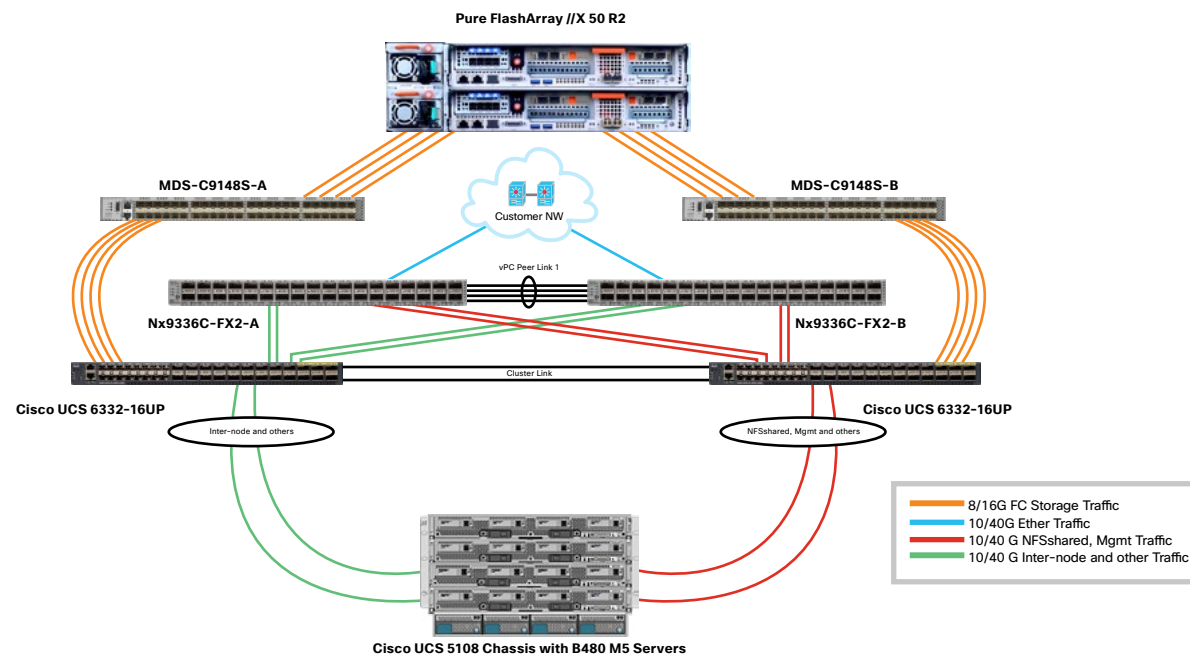
BUSINESS CHALLENGES

- 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





FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

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

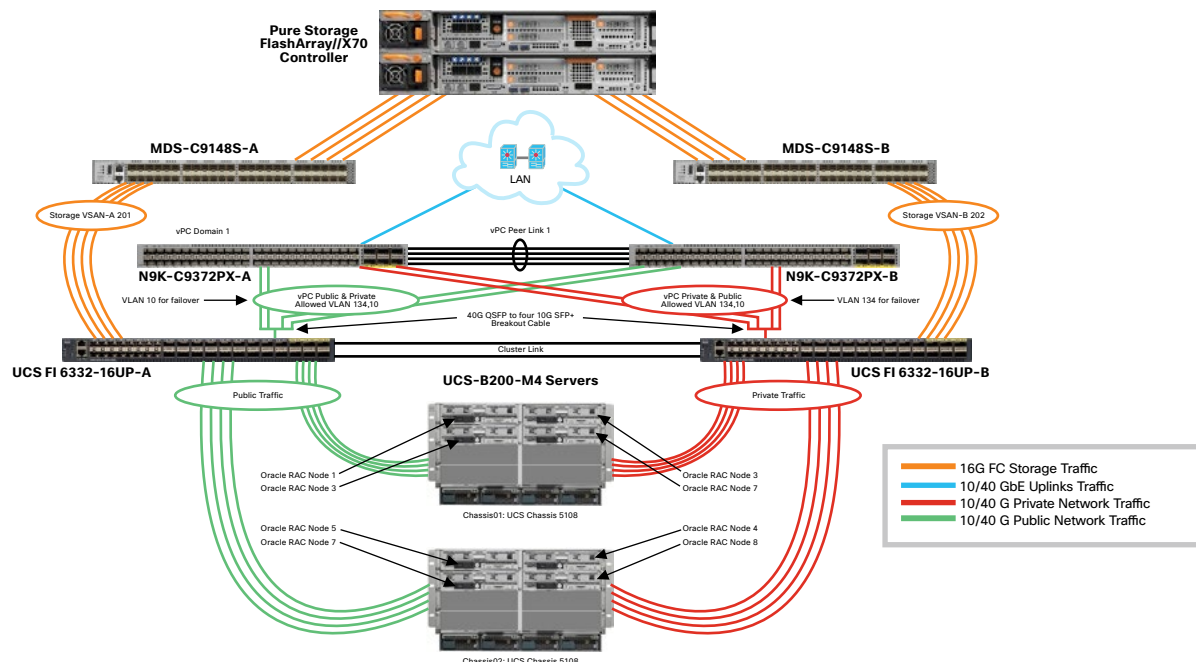
BUSINESS CHALLENGES

- New design targets a variety of scale-out application demands for database consolidation, management, and seamless data 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





FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats

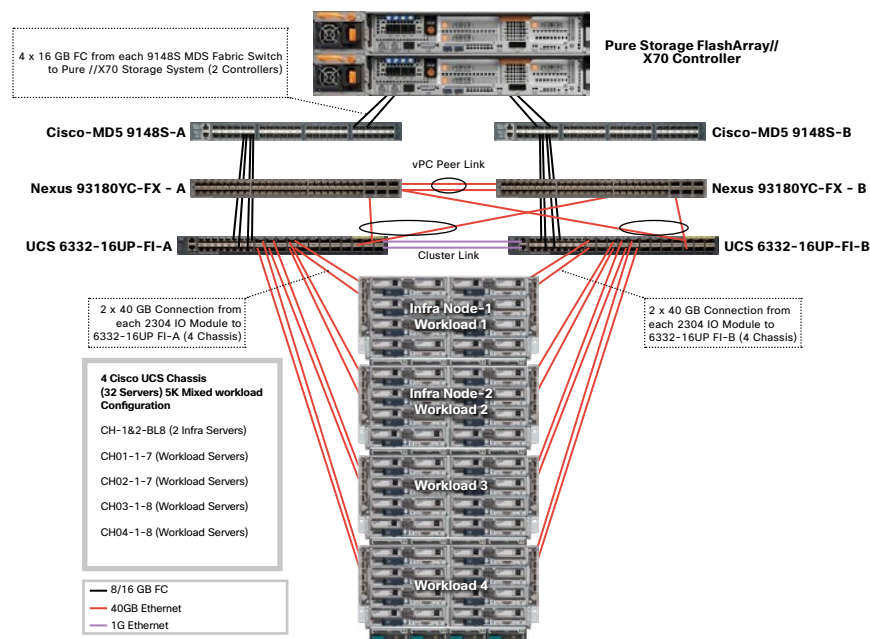
TECHNICAL HIGHLIGHTS

- 30 UCS B200 M5 Blade Servers, (n+1) with scale out option in a single UCS domain
- Cisco UCSM 3.2(2f)
- VMware Horizon 7.4
- VMware vSphere 6.5 U1
- Pure Storage FlashArray //X70 with All-NVMe DirectFlash Modules
- Purity v5.0.2

SUMMARY

- High density with a small footprint supporting mixed users workloads
- Very good end user experience on cluster level and 6000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability
- Investment protection in high density and high performance data center environments

ARCHITECTURE



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 VDI and RDSH solutions





FlashStack Virtual Server Infrastructure with Cisco ACI Multi-pod and Pure Storage ActiveCluster

TECHNICAL HIGHLIGHTS

- Cisco ACI 3.2(11) implementing the Multi-Pod design, extending the network between sites.
- PureStorage 5.0.6 with ActiveCluster for active/active, synchronously replicated storage.
- UCSM 3.2(3d) and vSphere 6.5 U1
- Highly redundant throughout the design. Stateless servers, implemented through policy decisions, that are easily recovered from an iSCSI foundation.

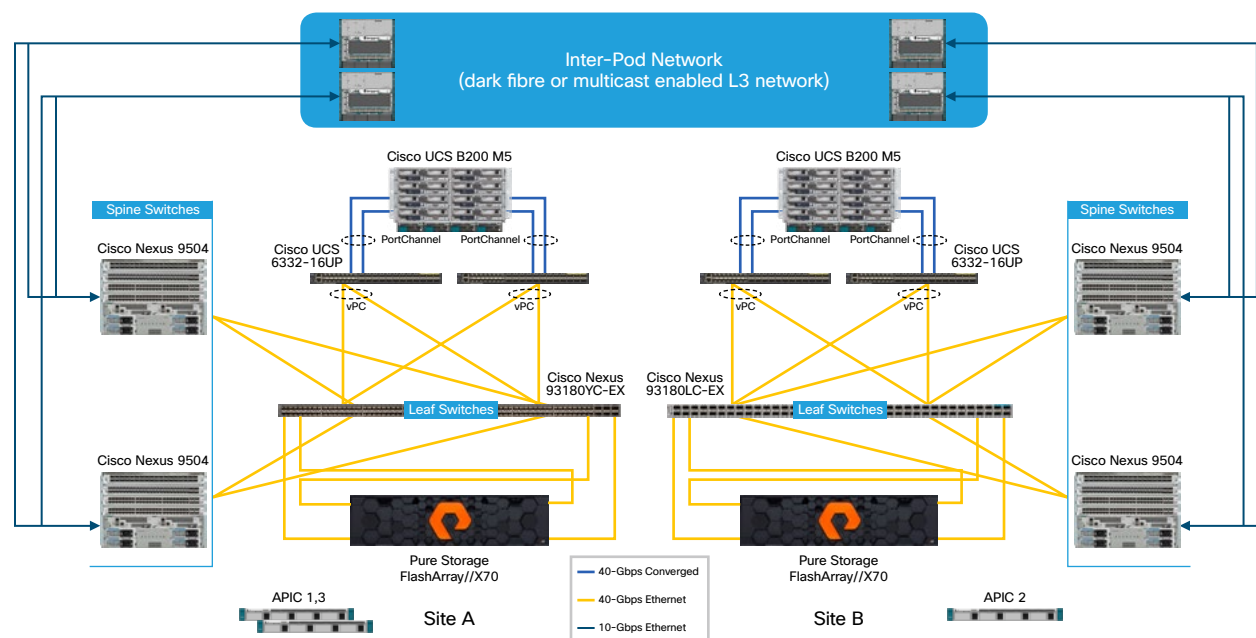
BUSINESS CHALLENGES

- Consistent workload environment regardless of the site.
- Reliable, Flexible and Scalable platform for mixed workloads.
- Business continuity through site availability issues.

SUMMARY

- Uniform data center experience across differing sites with common network and storage availability.
- Best of breed products between Cisco and Pure Storage, bringing workload portability and business continuity.
- Documented in a detailed, easy to follow guide, of how to implement the architecture.

ARCHITECTURE





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

TECHNICAL HIGHLIGHTS

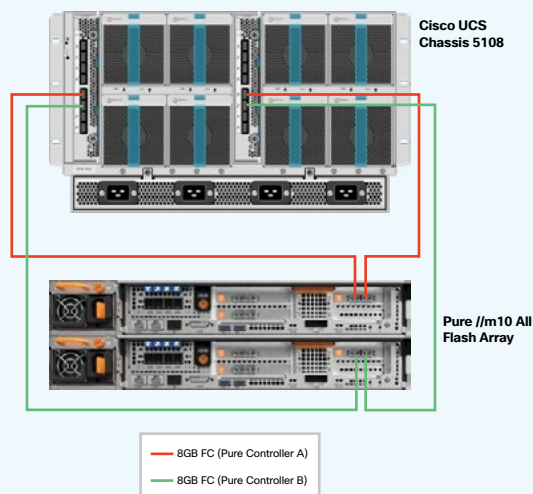
- Simple architecture with UCS B Series Servers
- High performance SAN for desktop workloads
- 1250 users per FlashStack Mini solution
- Performance study with simulations of typical desktop workloads

SUMMARY

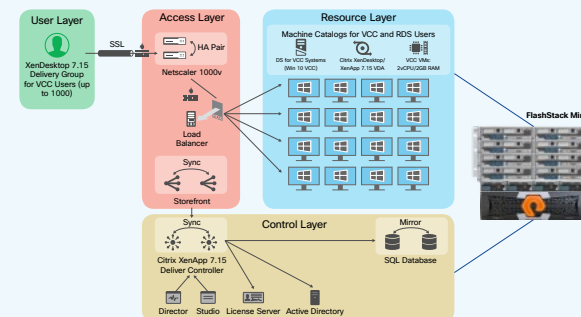
- High performance and scalability with simplicity
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Small footprint for SMB

ARCHITECTURE

Physical Architecture



Logical Architecture



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



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

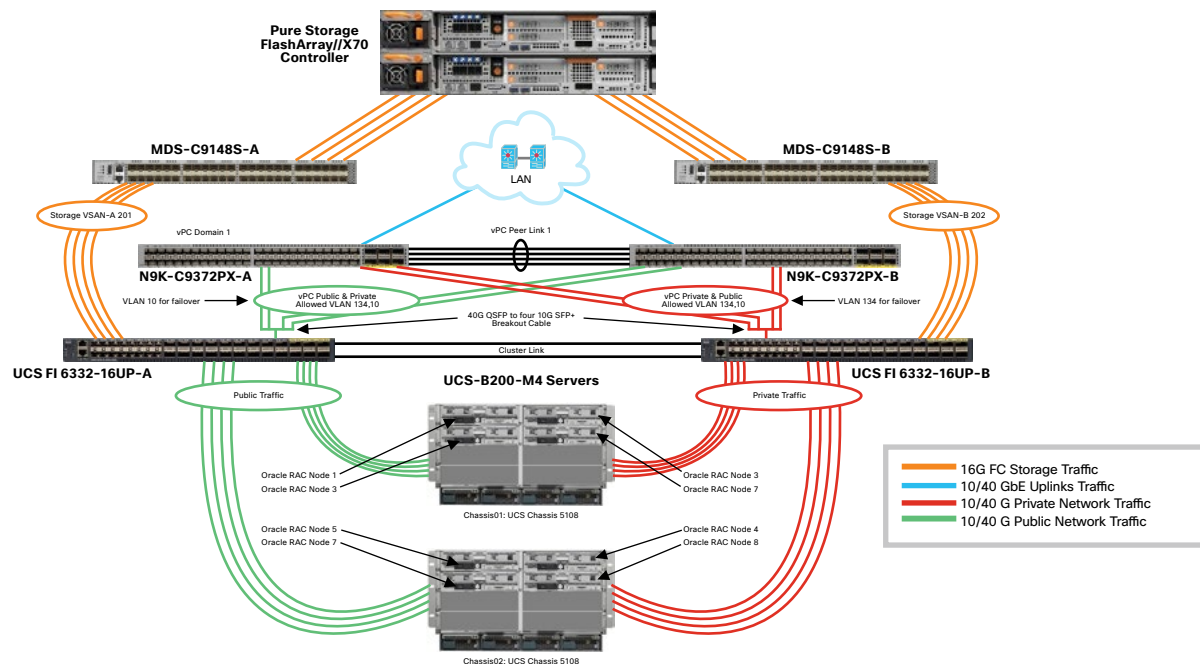
- New design targets a variety of scale-out application demands for database consolidation, management, and seamless date integration
- A cost-efficient, high performing and always-available infrastructure that balances enormous and evolving business requirements
- Pre-tested converged infrastructure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





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

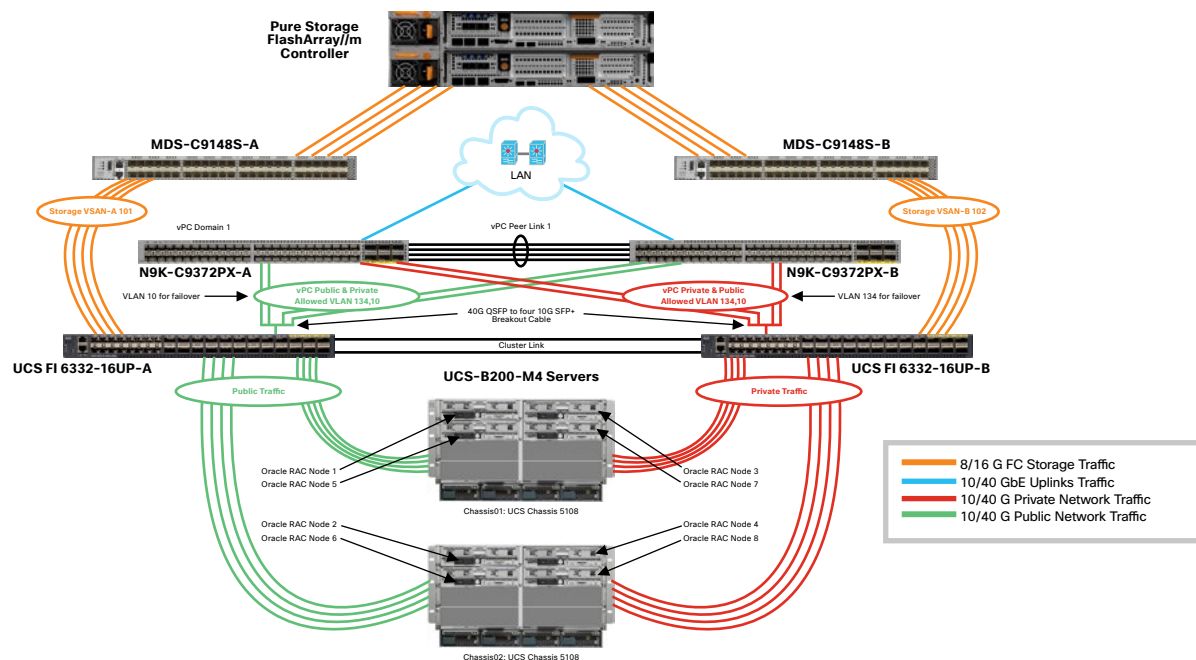
BUSINESS CHALLENGES

- 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





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

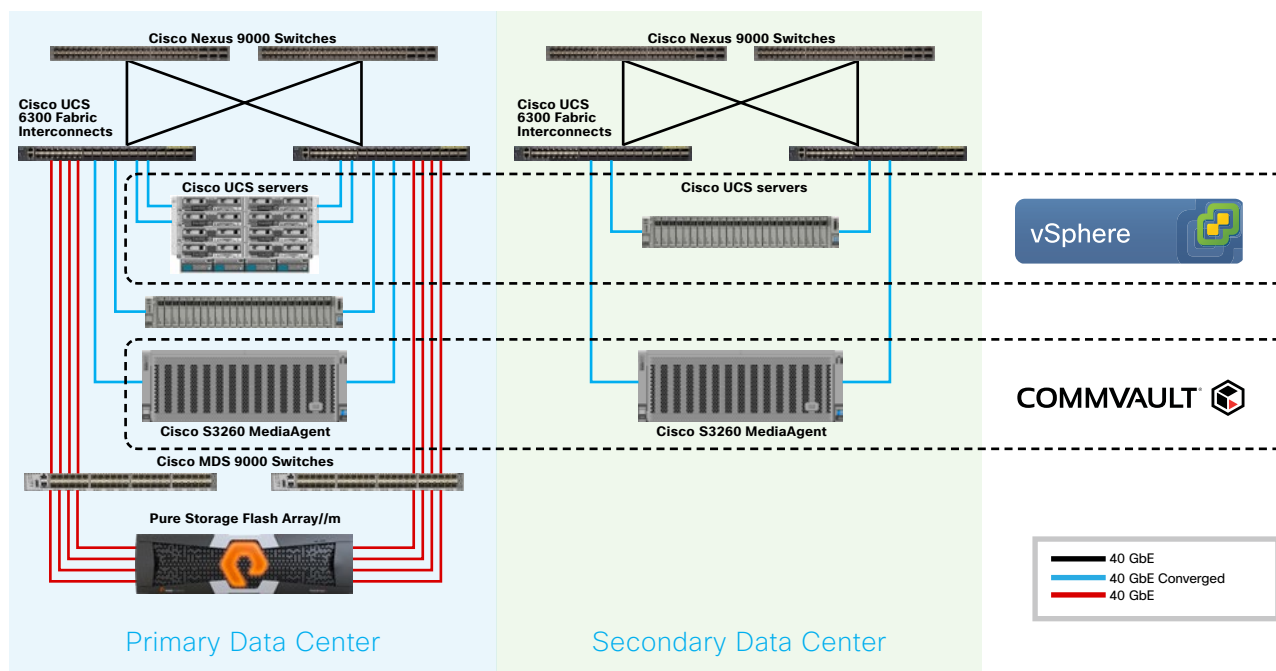
SUMMARY

- 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

BUSINESS CHALLENGES

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

ARCHITECTURE





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 footprint
- Performance study with simulations of RDS-hosted server sessions and VCC typical desktop workloads
- Local resources replace SAN for workload files

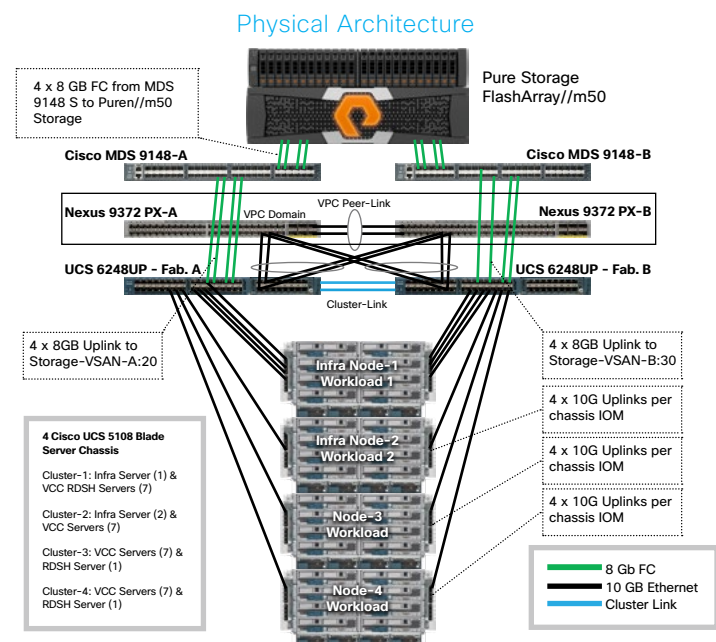
BUSINESS CHALLENGES

- 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



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 disk 40TB raw space
1 external disk shelf with 44TB raw space
(Total 88TB disk space)





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

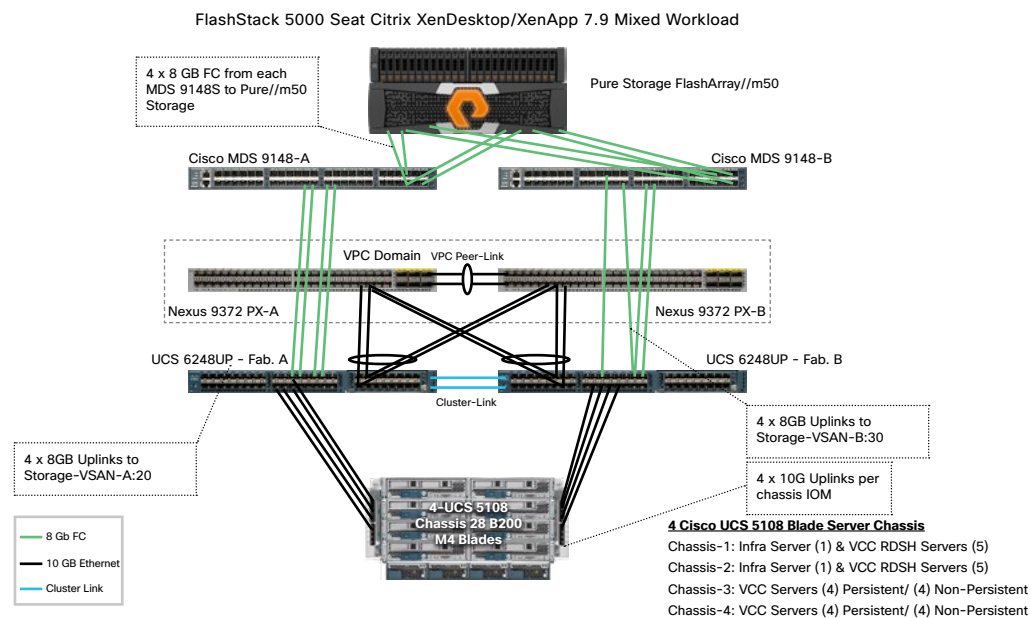
BUSINESS CHALLENGES

- 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





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

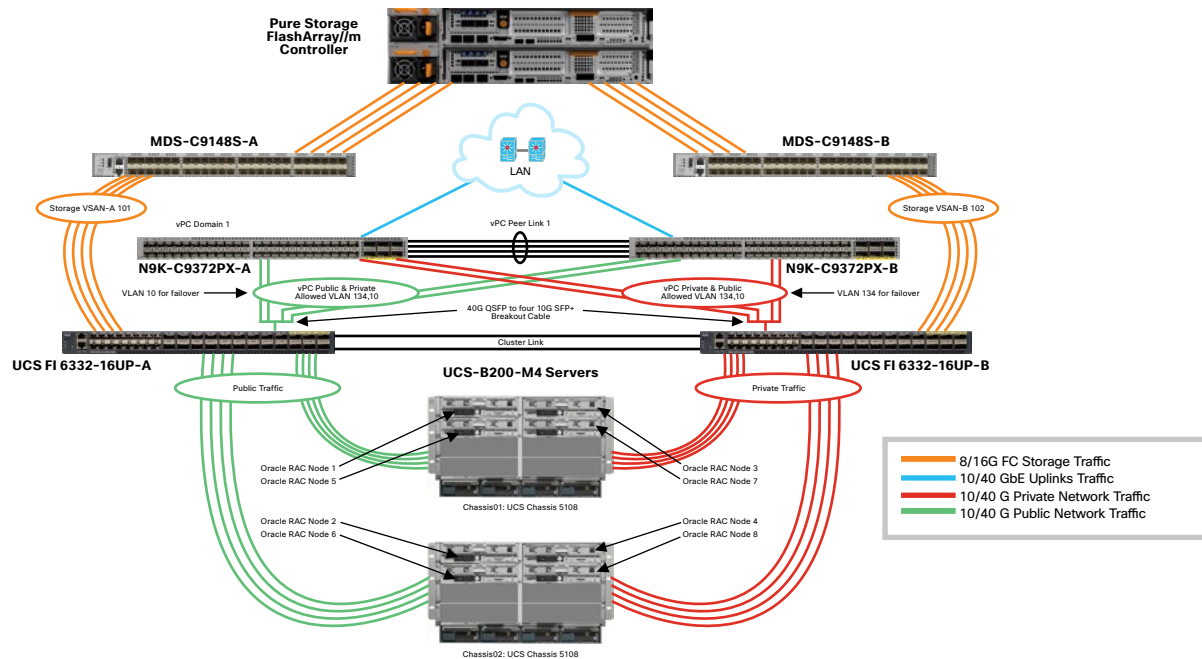
- A cohesive, integrated system that is managed, serviced and tested as a whole
- Leverage a pre-validated platform to minimize business disruption, improve IT agility and reduce deployment time from months to weeks
- Guarantee customer success with pre-built, pre-tested drivers, Oracle database software



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





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

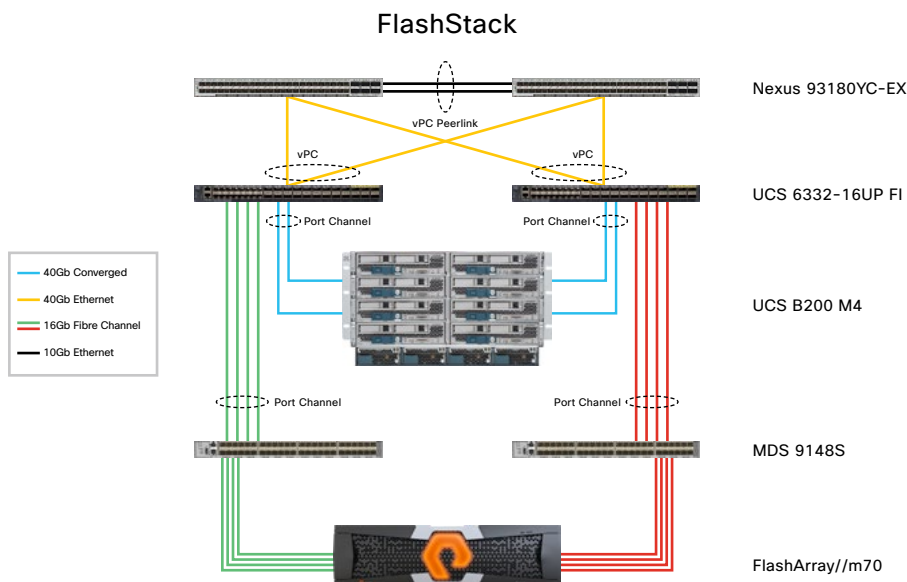
BUSINESS CHALLENGES

- 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





Infrastructure | Converged

HITACHI

- Cisco and Hitachi Adaptive Solutions for Converged Infrastructure - **New**
- Cisco and Hitachi Adaptive Solutions for SAP HANA TDI - **New**

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 and Hitachi Adaptive Solutions for Converged Infrastructure

TECHNICAL HIGHLIGHTS

- UCS 4th gen Fabric Interconnect as well as UCS 4th gen VIC.
- 32G FC end to end.
- Validation of both vSphere 6.5 and 6.7 within the design.
- Next gen Hitachi VSP Storage Systems with 100% data availability guarantee
- Hybrid or all-flash storage configurations available

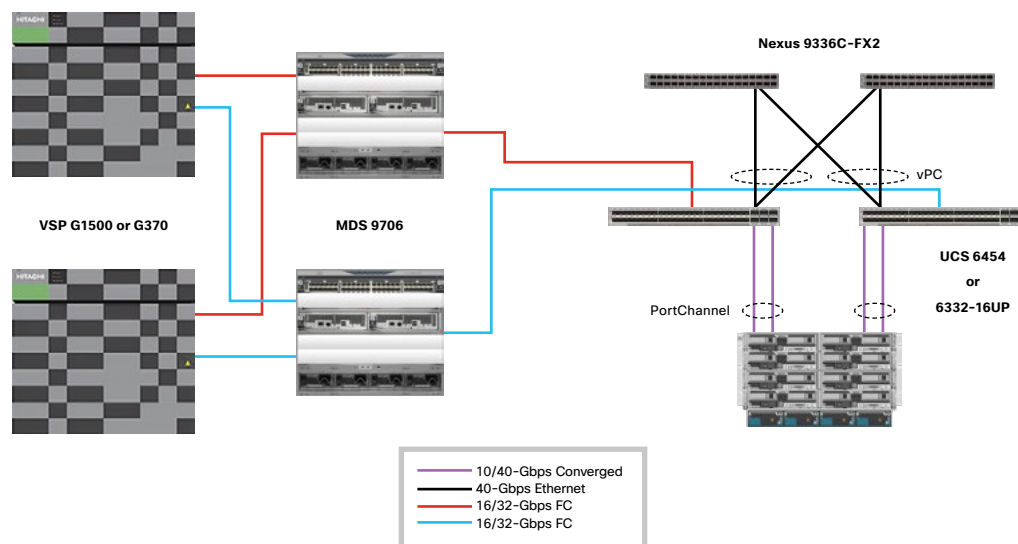
BUSINESS CHALLENGES

- Reliable, Flexible and Scalable platform for mixed workloads.
- High density server requirements, along with robust storage connectivity.
- A resilient, agile, and flexible foundation for today's business.

SUMMARY

- Simple, resilient and powerful solution of a validated converged infrastructure.
- Cisco and Hitachi Vantara collaboration of a unified reference architecture.
- Design Guide detailing the principles, with an easy to follow Deployment Guide of how to implement the design.

ARCHITECTURE





Cisco and Hitachi Adaptive Solutions for SAP HANA TDI

TECHNICAL HIGHLIGHTS

- Supports Cisco blade series servers B200 and B480 with all SAP supported Memory config
- Design document multiple OS SLES 12 SP4 and RHEL 7.5
- Design Supports Hitachi VSP Series storage.
- Provides detailed deployment guide for SAP HANA, SAP BW powered by SAP HANA, SAP Business Suite powered by SAP HANA, SAP Business Suite powered by SAP HANA, S/4HANA scenarios

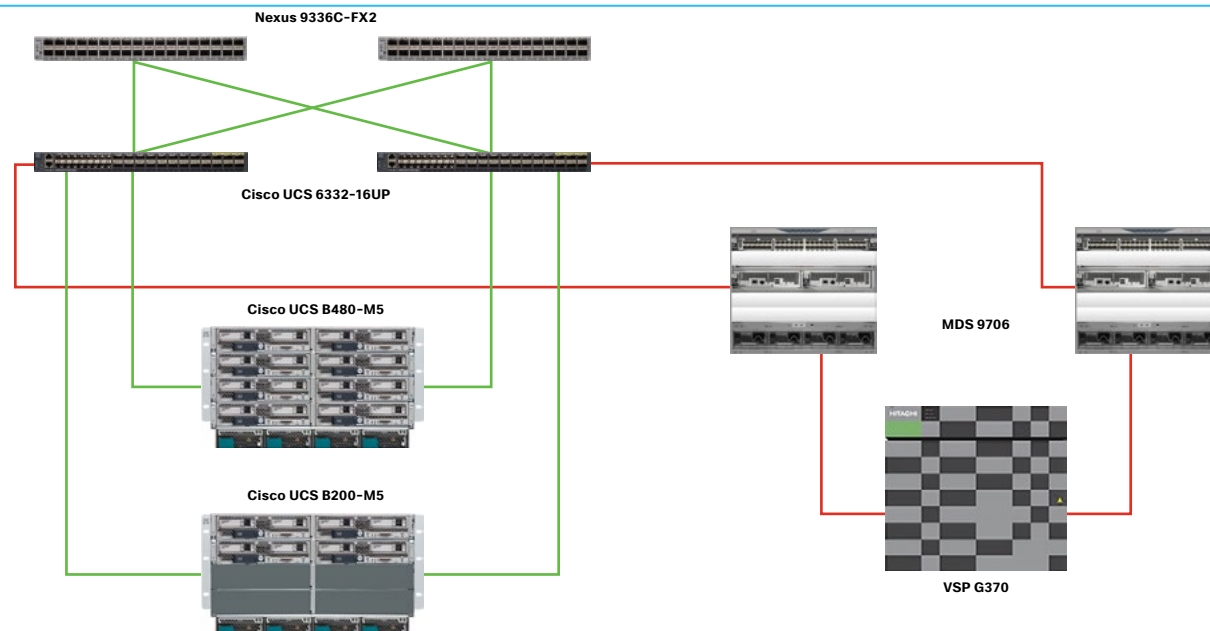
BUSINESS CHALLENGES

- Need for scalable and reliable infrastructure that can be implemented in an intelligent, policy driven manner
- Need for secured multi-tenancy across Compute, Network and Storage
- Need for proven end-to-end implementation of SAP HANA with resilient, agile, flexible infrastructure

SUMMARY

- The solution is designed and validated using compute, network and storage best practices for high performance, scalability, and resiliency throughout the architecture.
- Run mission-critical applications efficiently by independently and automatically scaling compute and storage
- Unify and automate the control of server, network, and storage components to simplify resource provisioning and maintenance.

ARCHITECTURE





Infrastructure

HYPERCONVERGED INFRASTRUCTURE

- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V - **New**
- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware - **New**
- Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users - **New**
- Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users - **New**
- Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V - **New**
- Cisco HyperFlex Virtual Server Infrastructure 3.0 with Cisco ACI 3.2 and VMware vSphere 6.5 - **New**
- Cisco HyperFlex with Cohesity Data Protection - **New**
- Cisco HyperFlex with Hyper-V 3.0 for Virtual Server Infrastructure - **New**
- Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi
- Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop
- Cisco HyperFlex 2.6 for Virtual Server Infrastructure
- Cisco HyperFlex 2.5 for Virtual Server Infrastructure
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users
- Cisco HyperFlex with Veeam Availability Suite for Multisite Deployments
- 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 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V

TECHNICAL HIGHLIGHTS

- HyperFlex 3.5 cluster with Hyper-V
- 4 x HXAF240c M5 Nodes
- Windows Server 2016 and MS SQL Server 2016 SP1
- Cisco UCSM 4.0 (1b)
- 2x Cisco Nexus 9396PX

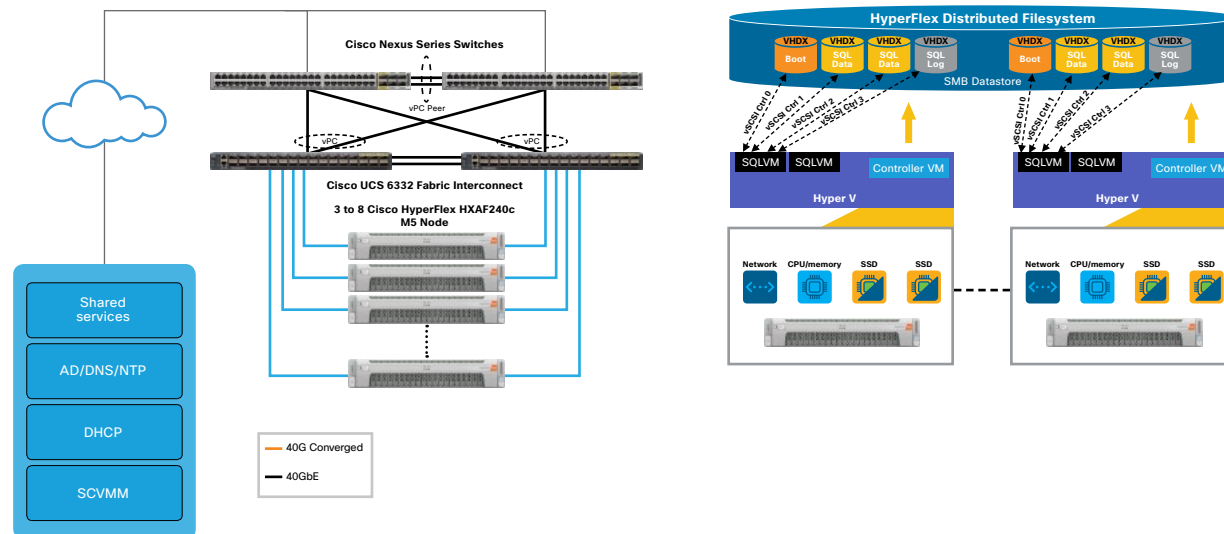
SUMMARY

- Deployment best practices for hosting MS SQL databases on HyperFlex All Flash Systems with Windows Hyper-V.
- HA deployment options - Always On Availability Group.
- Test and performance validation of OLTP database workloads and DB maintenance tasks

ARCHITECTURE

BUSINESS CHALLENGES

- MS SQL Servers on standalone servers causing database sprawl
- MS SQL Server 2008 End-of-Support
- Underutilized servers in traditional infrastructure.
- Siloed and disintegrated management in traditional infrastructure
- Virtualization license/cost challenges





Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware



TECHNICAL HIGHLIGHTS

- HyperFlex 3.5 cluster with VMware ESXi 6.5
- 4 x HXAF240c M5 Nodes
- Windows Server 2016 and MS SQL Server 2016 SP1
- Cisco UCSM 4.0 (1b)
- 2x Cisco Nexus 9396PX
- HX Stretched Cluster



SUMMARY

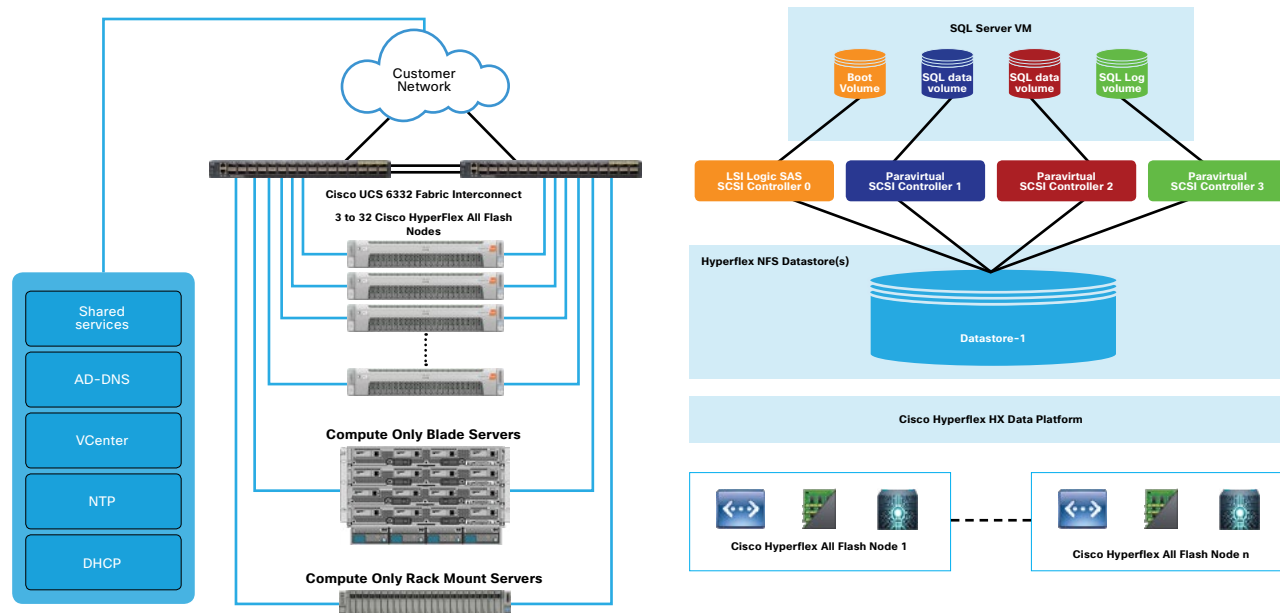
- Deployment best practices for hosting MS SQL databases on HyperFlex All Flash Systems with VMware ESXi.
- HA deployment options - Always On Availability Group.
- Test and performance validation of OLTP database workloads and DB maintenance tasks
- Stretch Cluster deployment & validation for disaster recovery



BUSINESS CHALLENGES

- MS SQL Servers on standalone servers causing database sprawl
- MS SQL Server 2008 End-of-Support
- Underutilized servers in traditional infrastructure
- Siloed and disintegrated management in traditional infrastructure

ARCHITECTURE





Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users

TECHNICAL HIGHLIGHTS

- 32 Node All Flash Hyperflex Solution: 16 UCS HXAF220C-M5SX rack servers and 8 UCS 220C-M5 rack servers + 8 UCS B200 M5 blade servers (n+1 cluster) with scale out option in a single UCS domain
- Cisco HyperFlex v3.5(1a), UCSM 4.0(1b)
- Nexus 93180 YC switches,
- VMware vSphere 6.5.2.U2, VMware Horizon 7 .6
- 4400 User Windows Server 2016 RDS Sessions & Windows 10 mixed Knowledge Worker workload density.

BUSINESS CHALLENGES

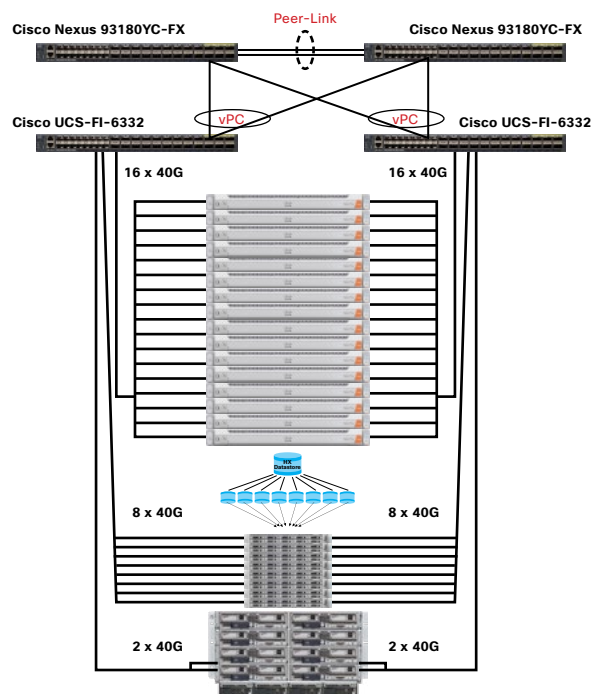
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability.

SUMMARY

- All Flash HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment
- Very good sub mil second knowledge worker workload End User Experience

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Full Scale Single UCS Domain Reference Architecture



16 x Cisco HXAF C220-M55X Rack Servers

Each Server Includes:

- 2x Intel Xeon Gold 6140 Scalable family processor @ 2.3 GHz
- 240GB M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666 MHz
- 1 x Cisco VIC 1387 mLOM
- 1 x Cisco 12 GBPs 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

8 x Cisco UCS C220 M5 Rack Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1387

8 x Cisco UCS B200 M5 Blade Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users

TECHNICAL HIGHLIGHTS

- 8x UCS HX220-M5S rack servers, & 8x B200M5 servers for compute (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.5.1a, UCSM 4.0.1(b)
- Citrix Virtual Apps & Desktops 1808
- Vmware ESXi 6.5

BUSINESS CHALLENGES

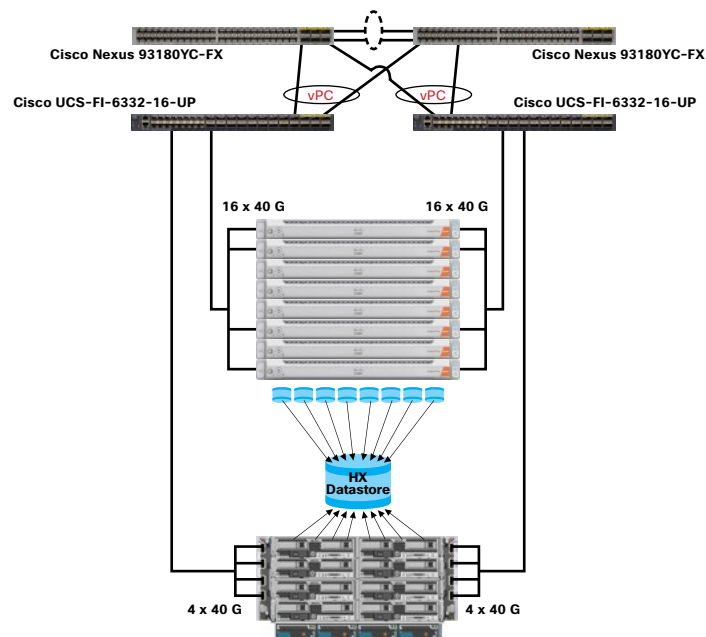
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex All-Flash system for Citrix Virtual Desktop 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 Citrix Virtual Apps and Desktops, Single UCS Domain Reference Architecture



8 x Cisco HXAF220C-M5SX or Cisco HXAF240C-M5SX Rack Servers

Each Server Includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz
- 240GB M.2 SATA SSD
- 768 GB (24 x 32GB DDR4) RAM @ 2666 MHz
- 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

8 x Cisco UCS B200 M5 Blade Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (24 x 32GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





Cisco HyperFlex 3.0 for Virtual Server Infrastructure with Microsoft Hyper-V

TECHNICAL HIGHLIGHTS

- Eight HX220 or HX240 M5 rackmount servers with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1d, UCSM 3.2(3g) and Microsoft Windows Server 2016 Hyper-V
- High performance, scalable and resilient virtual environment
- Detailed UCS and HyperFlex design descriptions, installation, functional operation and best practices

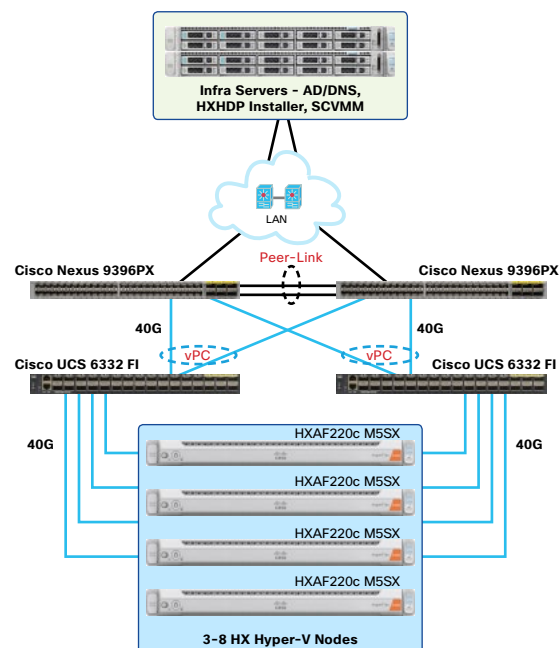
BUSINESS CHALLENGES

- 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

- First CVD release for Cisco HyperFlex platform with Hyper-V.
- Installation of standard HX Clusters using HyperFlex Installer appliance
- CVD highlights all product options, provides best practices, Installation and provides day two instructions for all core features

ARCHITECTURE





Cisco HyperFlex Virtual Server Infrastructure 3.0 with Cisco ACI 3.2 and VMware vSphere 6.5

TECHNICAL HIGHLIGHTS

- Cisco HX220c M5 servers that form the HyperFlex 3.0 cluster, connect to Cisco UCS 6332 Fabric Interconnects running Cisco UCS Manager 3.2(3e)
- Cisco ACI fabric, built using Nexus 9000 series switches and managed by Cisco APIC running 3.2(2l) software, provides 40GbE connectivity to Cisco HyperFlex cluster
- Cisco ACI Virtual Edge (AVE) running 1.2(2a) provides ACI vLeaf and virtual switching functions
- Cisco Intersight and Cisco Umbrella provides cloud based management security for the solution

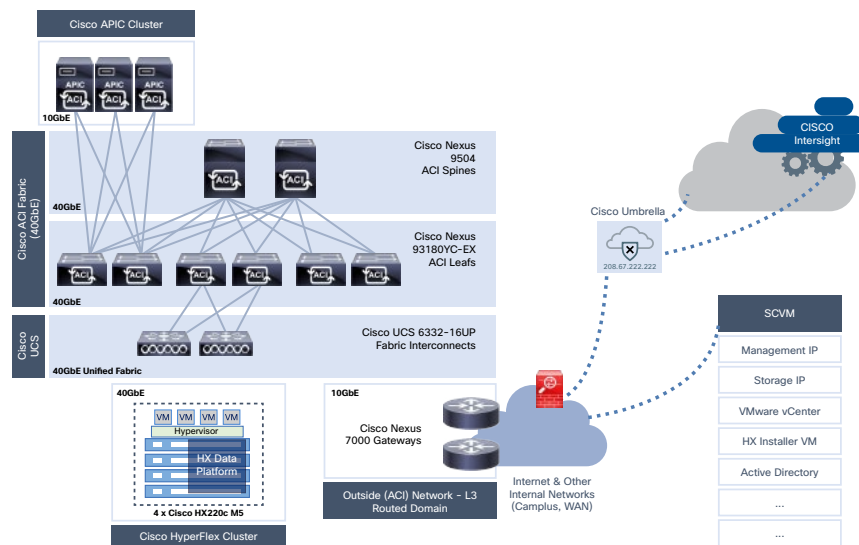
BUSINESS CHALLENGES

- Speed up deployment of applications and services by reducing infrastructure deployment times and increasing operational efficiency
- Highly automated data center infrastructure with the operational agility to support rapidly evolving business needs

SUMMARY

- Next-generation Data Center Infrastructure for Enterprise & Cloud deployments based on Cisco HyperFlex, Cisco UCS, Cisco ACI and VMware vSphere
- Cisco HyperFlex delivers agility and simplicity of complete hyperconvergence with Cisco UCS based unified computing, fabric and management
- Cisco ACI brings software-defined networking solutions to deliver a programmable data center fabric, with centralized management and application policy model to enable rapid deployment of applications and improve application agility
- Cisco Nexus 9000 EX series cloud-scale switches used as ACI leaf switches provide a high-performance, low-latency platform with advanced capabilities that include deep telemetry and security, analytics and intelligent traffic management for maximizing application performance and visibility.

ARCHITECTURE





Cisco HyperFlex with Cohesity Data Protection

TECHNICAL HIGHLIGHTS

- Cohesity cluster of 3 or more Cisco C240 M5L servers using a specific Cohesity BoM
- Servers are UCS Managed, not standalone
- Solution based on 4th generation FI 6454 and VIC 1457
- Cisco UCSM 4.0(1c)
- Cisco HyperFlex 3.5(2a) or later required
- Cohesity version 6.1.1a or later required

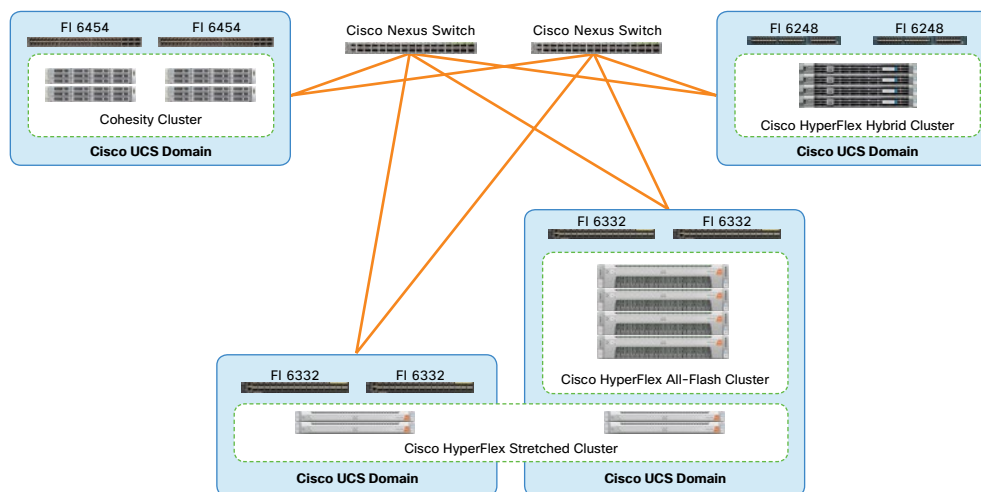
BUSINESS CHALLENGES

- Secondary storage systems (backup/replication/test) are often highly fragmented, using multiple platforms
- Traditional secondary storage systems do not scale well, leading to significant sprawl and complexity
- Outdated architectures do not work well with hyperconverged virtual systems and cloud

SUMMARY

- Cohesity integration with Cisco HyperFlex via the HX API for snapshot controls
- Cohesity cluster provides policy based VM protection for HyperFlex clusters or other external systems
- Rapid mass restores and return to service
- On-prem cluster to cluster backup replication and archiving, and to cloud
- Test/Dev temporary VM cloning

ARCHITECTURE





Cisco HyperFlex with Hyper-V 3.0 for Virtual Server Infrastructure

TECHNICAL HIGHLIGHTS

- Eight HX220 or HX240 M5 rackmount servers with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1d, UCSM 3.2(3g) and Microsoft Windows Server 2016 Hyper-V
- High performance, scalable and resilient virtual environment
- Detailed UCS and HyperFlex design descriptions, installation, functional operation and best practices

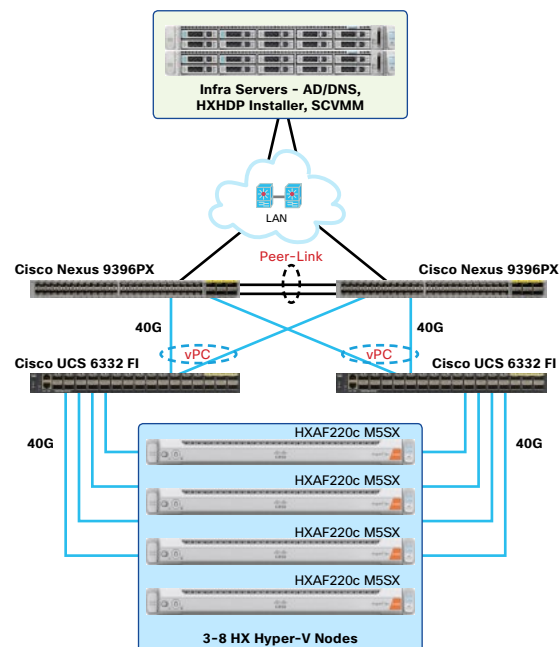
BUSINESS CHALLENGES

- 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

- First CVD release for Cisco HyperFlex platform with Hyper-V.
- Installation of standard HX Clusters using HyperFlex Installer appliance
- CVD highlights all product options, provides best practices, Installation and provides day two instructions for all core features

ARCHITECTURE





Cisco HyperFlex 3.0 for Virtual Server Infrastructure with VMware ESXi

TECHNICAL HIGHLIGHTS

- New installation option for stretched clusters spread across two physical sites.
- Logical Availability Zones feature provides enhanced failure tolerance in larger clusters.
- Support for HyperFlex on Large Form Factor disks and Intel Optane caching options.
- New GUI replication and recovery workflows.
- Scalable & flexible architecture: 64 node clusters, Expanded Clusters with Compute-only Nodes, and Mixed M4/M5 generation Clusters.

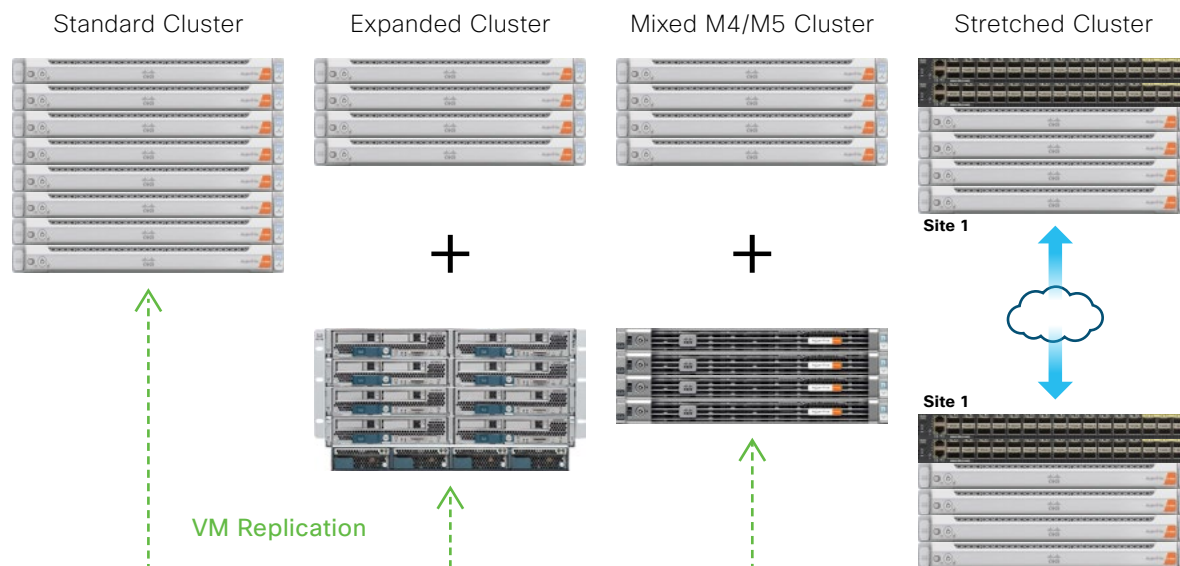
BUSINESS CHALLENGES

- 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, provides best practices, and provides day two instructions for all core features.

ARCHITECTURE





Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users Infrastructure, Applications

TECHNICAL HIGHLIGHTS

- 8 UCS HXAF220C-M5SX rack servers and 8 UCS B200 M5 blade server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1a, UCSM 3.2(3a)
- Nexus 93180 YC switches
- VMware vSphere 6.5 VMware Horizon 7
- 2000 User Windows 10 & Server 2016 RDSH sessions mixed Knowledge Worker workload density.

BUSINESS CHALLENGES

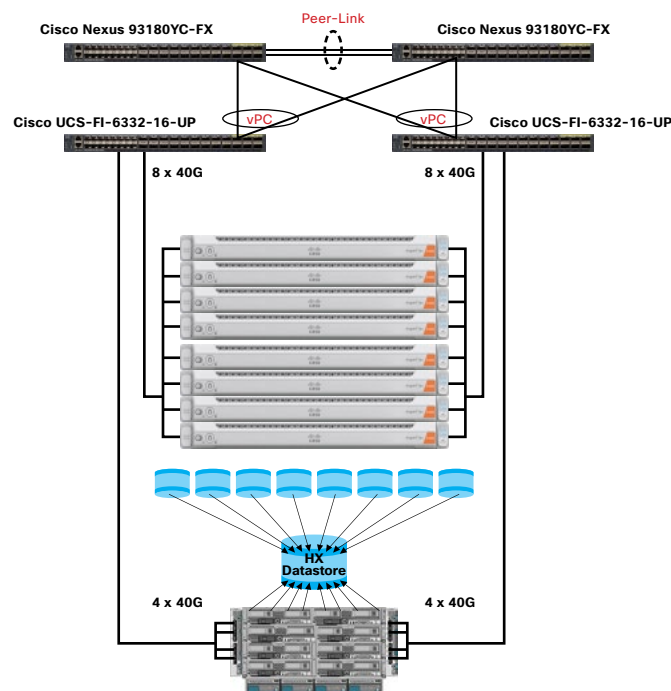
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability.

SUMMARY

- All Flash HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment
- Very good sub mil second knowledge worker workload End User Experience

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Full Scale UCS Domain Reference Architecture



8 x Cisco HXAF220C-M5SX

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 240GB M.2 SATA SSD
- 768 GB (24 X 32GB DDR4) RAM @ 2666MHz
- 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

8 x Cisco UCS B200 M5 Blade Servers Each server includes:

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120GB M.2 SATA SSD
- 768 GB (24 X 32GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users

TECHNICAL HIGHLIGHTS

- 4 UCS HXAF220C-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1b, UCSM 3.2(2d)
- XenDesktop 7.16
- VMware vSphere 6.5 U1

BUSINESS CHALLENGES

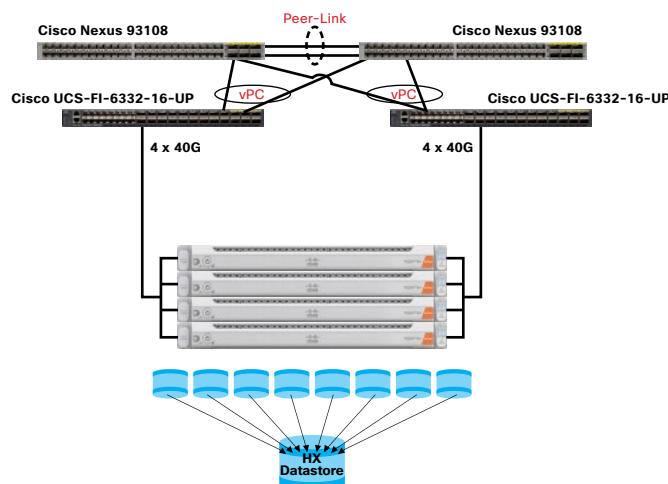
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of 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 Citrix XenDesktop 7.16, 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
- 120GB 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





Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop

TECHNICAL HIGHLIGHTS

- 4 UCS HXAF220C-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1a, UCSM 3.2(2d)
- XenDesktop 7.17
- Microsoft Hyper-V 2016

BUSINESS CHALLENGES

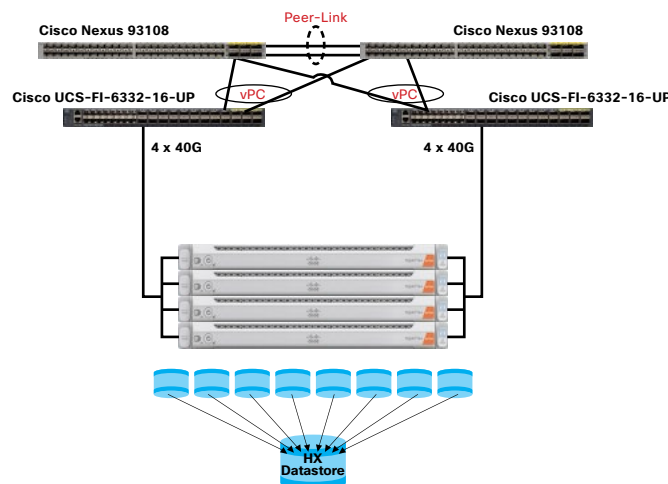
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience
- Best practices for installation and Deployment of Cisco HyperFlex All-Flash system for Citrix XenDesktop turned 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 Citrix XenDesktop 7.16, 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
- 120GB 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





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

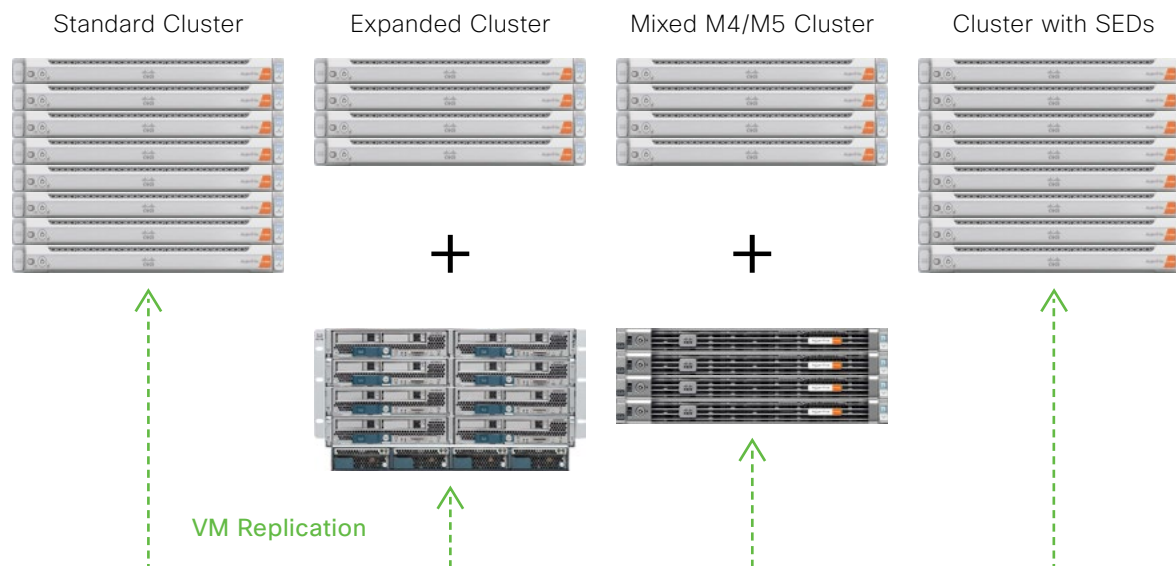
BUSINESS CHALLENGES

- 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





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



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



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



Hybrid or All-Flash Clusters

Plus Compute-Only Nodes:



Cisco Rack Mount Servers

or



Cisco Blade Servers





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

TECHNICAL HIGHLIGHTS

- 16 UCS HXAF220-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

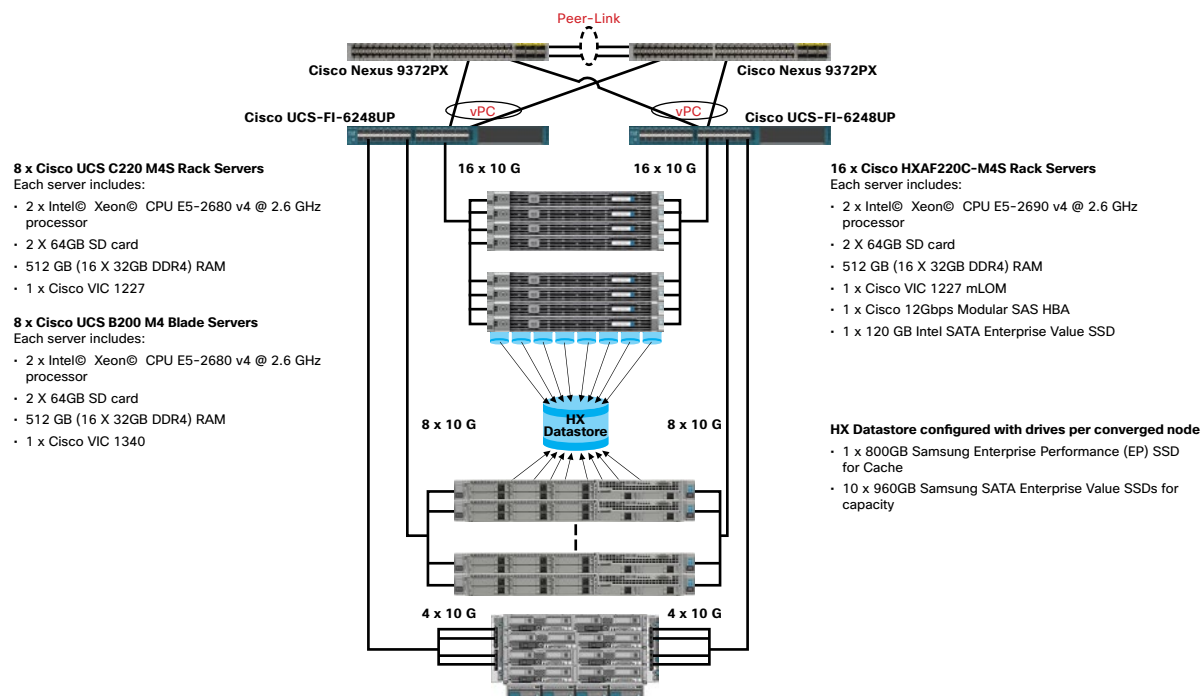
BUSINESS CHALLENGES

- 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





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

TECHNICAL HIGHLIGHTS

- 16 UCS HXAF220-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

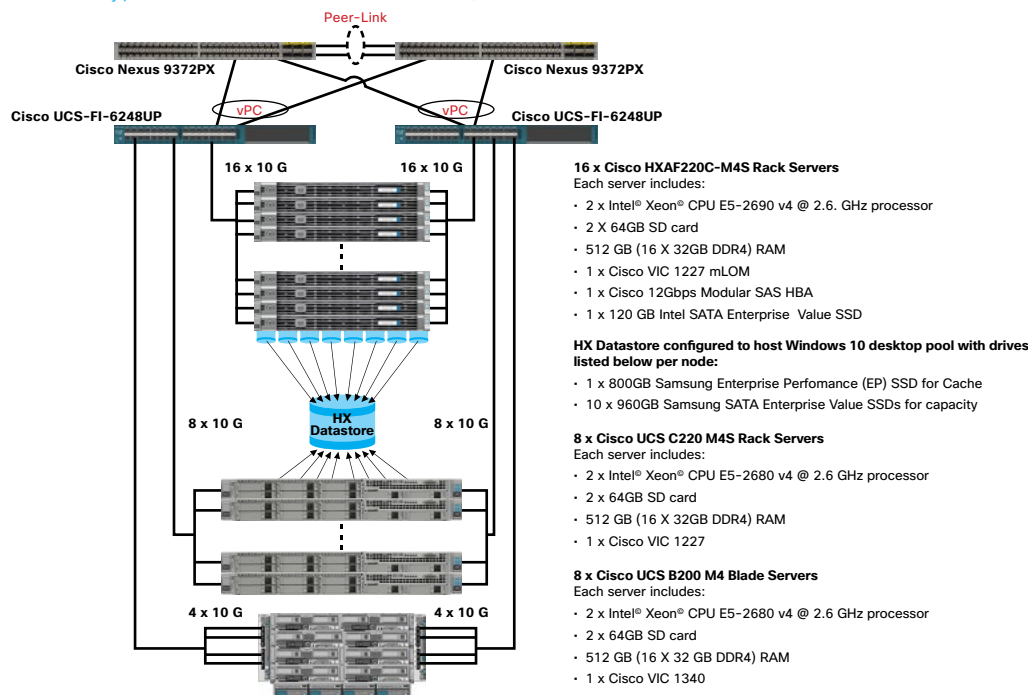
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco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





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

TECHNICAL HIGHLIGHTS

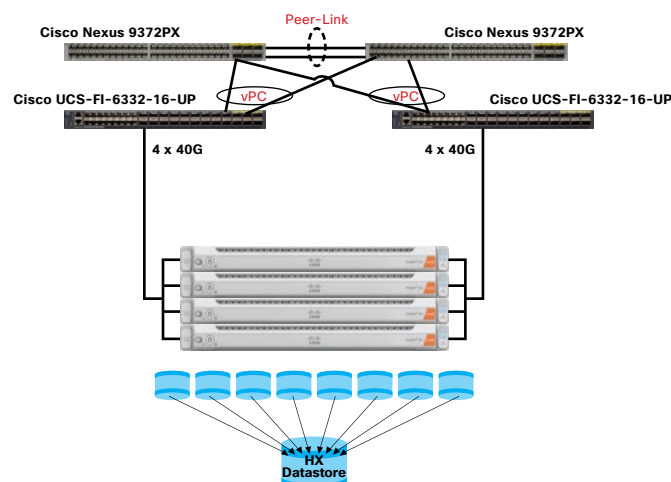
- 4 UCS HXAF220-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1a, UCSM 3.2(2b)
- VMware Horizon 7.3.1
- VMware vSphere 6.5 U1

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

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

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





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

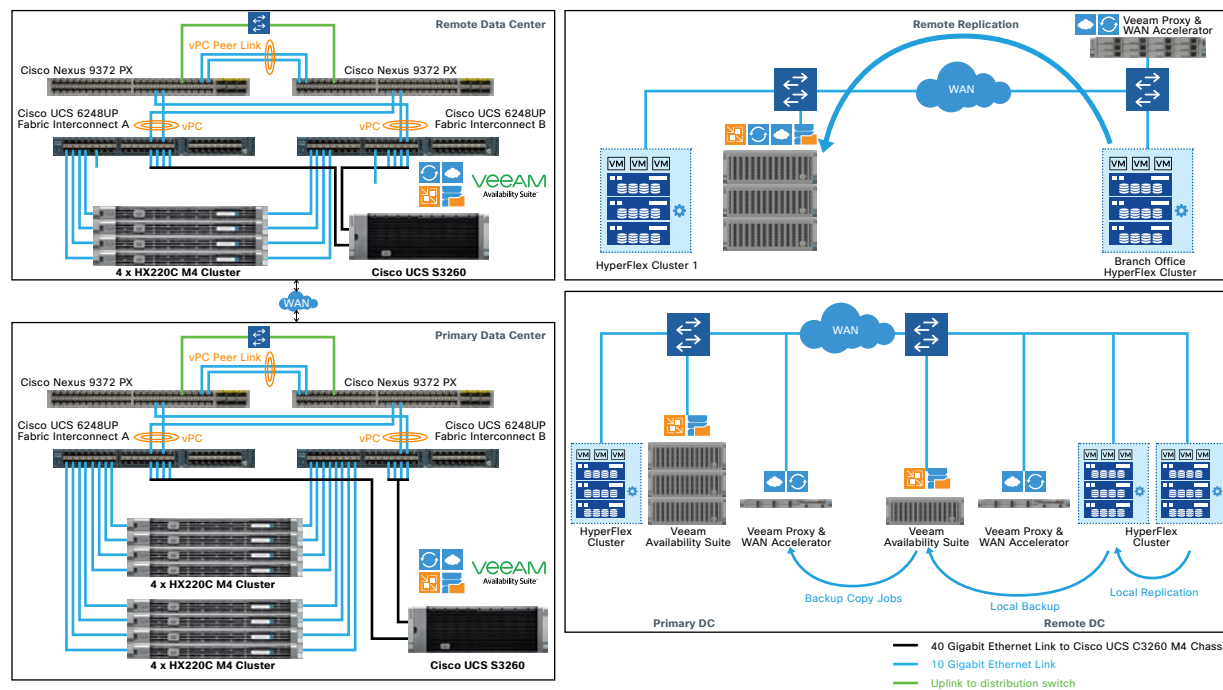
BUSINESS CHALLENGES

- 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





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

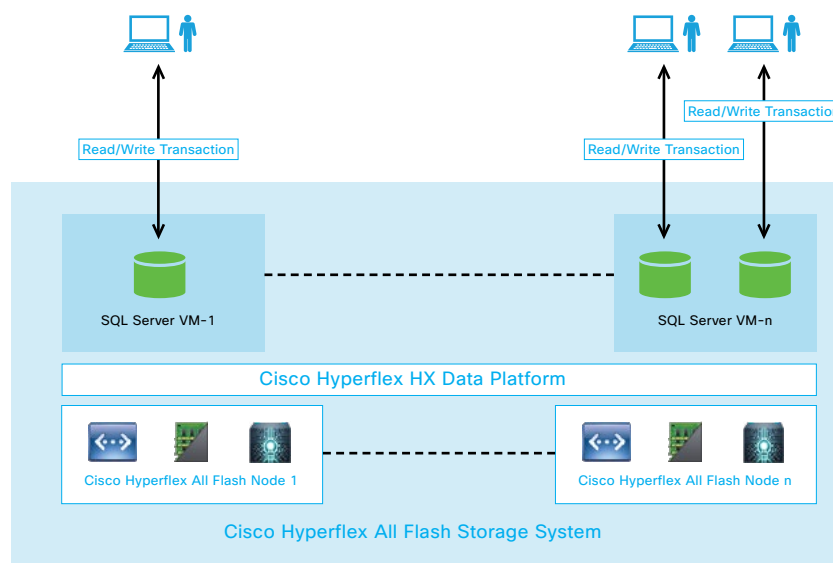
BUSINESS CHALLENGES

- 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





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

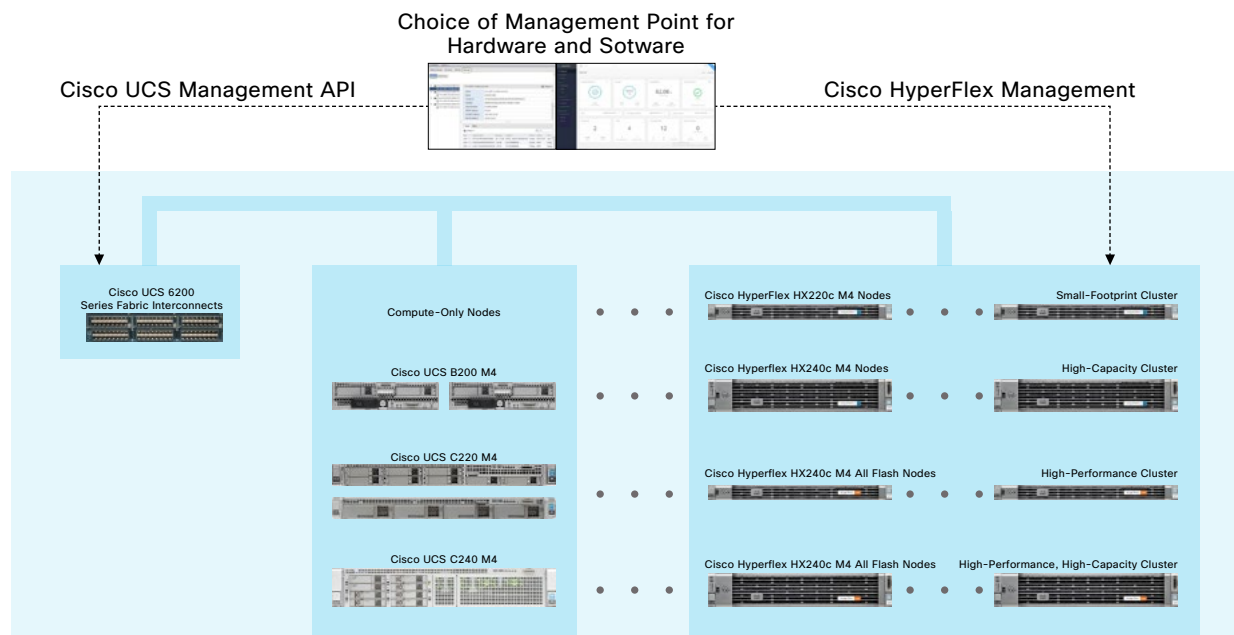
BUSINESS CHALLENGES

- 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





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

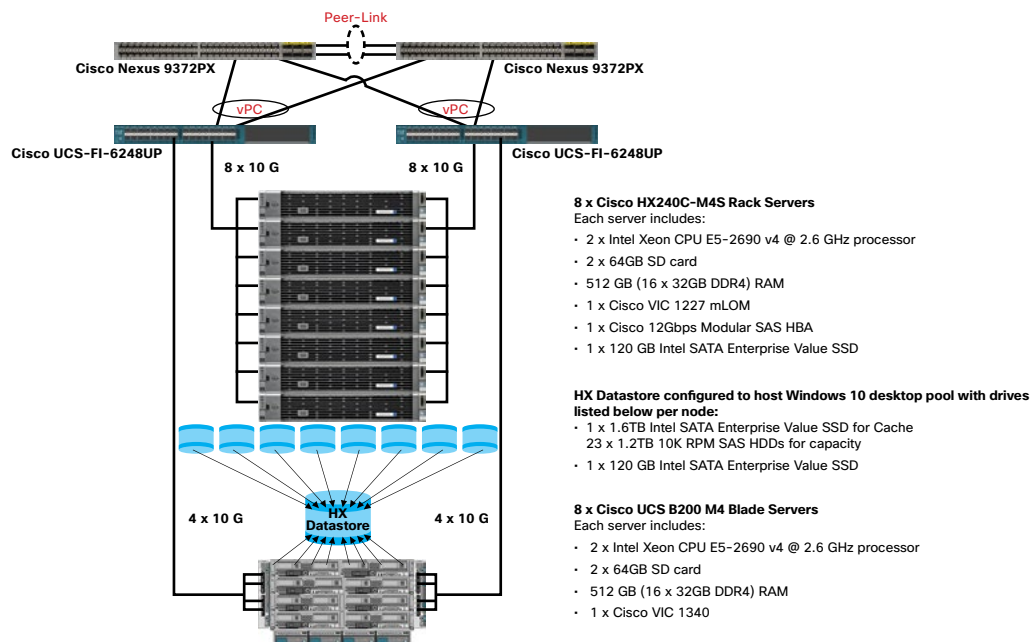
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless data center integration and management, and energy efficiency
- Enterprise-grade virtual client computing solution with excellent end user experience
- Best practices for installation and deployment of Cisco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





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

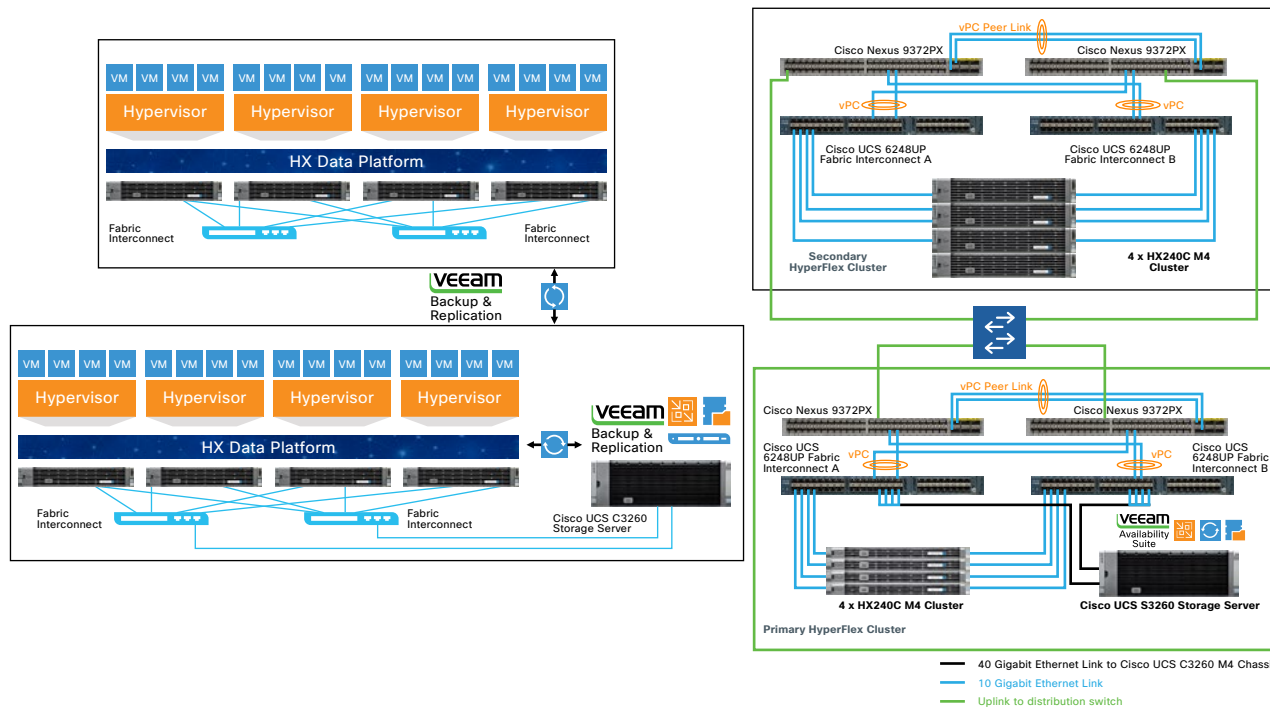
BUSINESS CHALLENGES

- 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





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

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

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

HX220c



HX240c



B200 & HX240c



HyperFlex



Cisco HyperFlex with Veeam Availability Suite

TECHNICAL HIGHLIGHTS SUMMARY

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

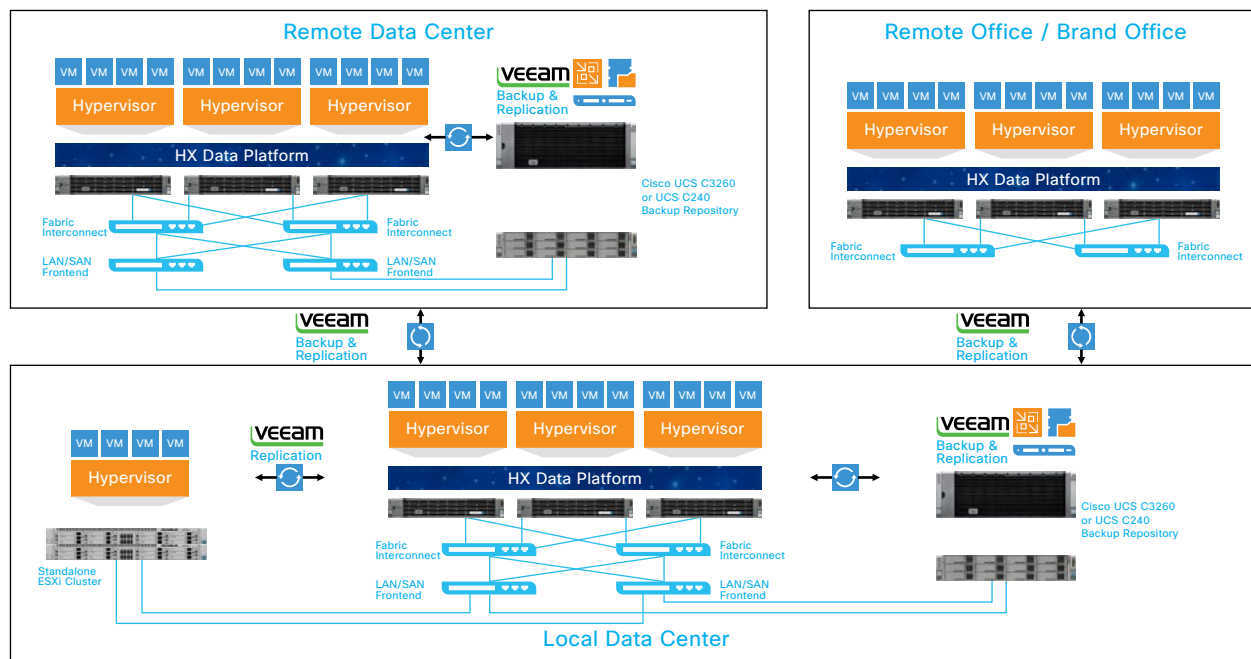
SUMMARY

- 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

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





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

ARCHITECTURE

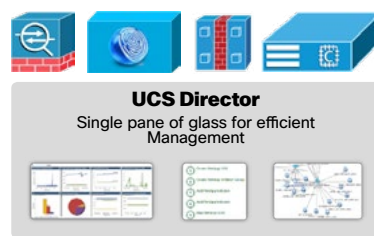
BUSINESS CHALLENGES

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

Cisco Integrated Infrastructures

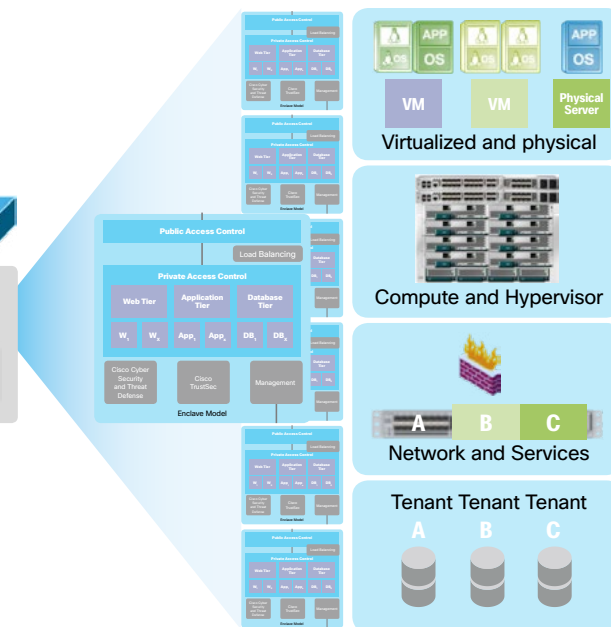


Cisco and Partner Security Technologies



UCS Director

Single pane of glass for efficient Management





Applications

ORACLE

Virtual

- FlexPod Datacenter with Oracle RAC on Oracle Linux

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.

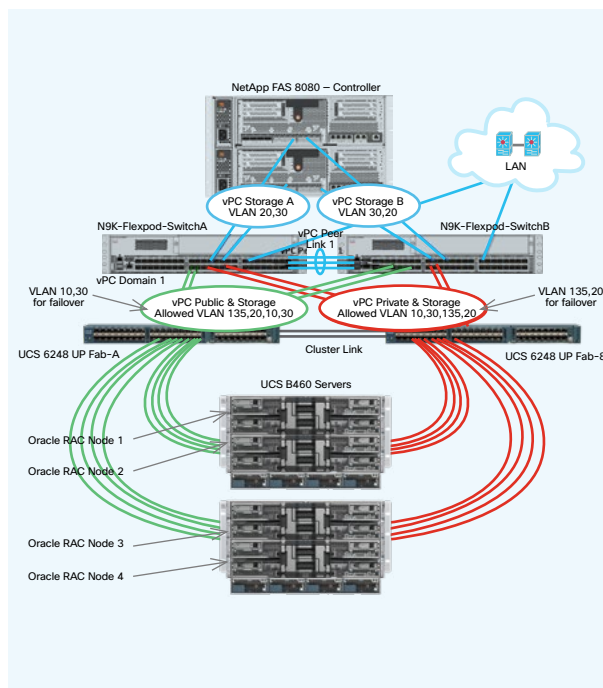
BUSINESS CHALLENGES

- 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

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





Applications

ORACLE

Physical Server

- FlexPod Datacenter with Oracle RAC on Cisco UCS and NetApp AFF A-Series - **New**
- FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade
- FlashStack Data Center with Oracle RAC 12cR2 Database
- FlashStack for Oracle 12c RAC on Oracle Linux
- FlashStack Data Center with Oracle RAC on Oracle Linux

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 Cisco UCS and NetApp AFF A-Series

TECHNICAL HIGHLIGHTS

- Cisco UCS 3.2(3c), Cisco UCS B200 M5 Blade Servers and NetApp AFF A700s with Oracle 12cR2 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 All Flash Array powered by NetApp Clustered Data ONTAP 9.3 and Cisco UCS running OLTP and DSS Databases together

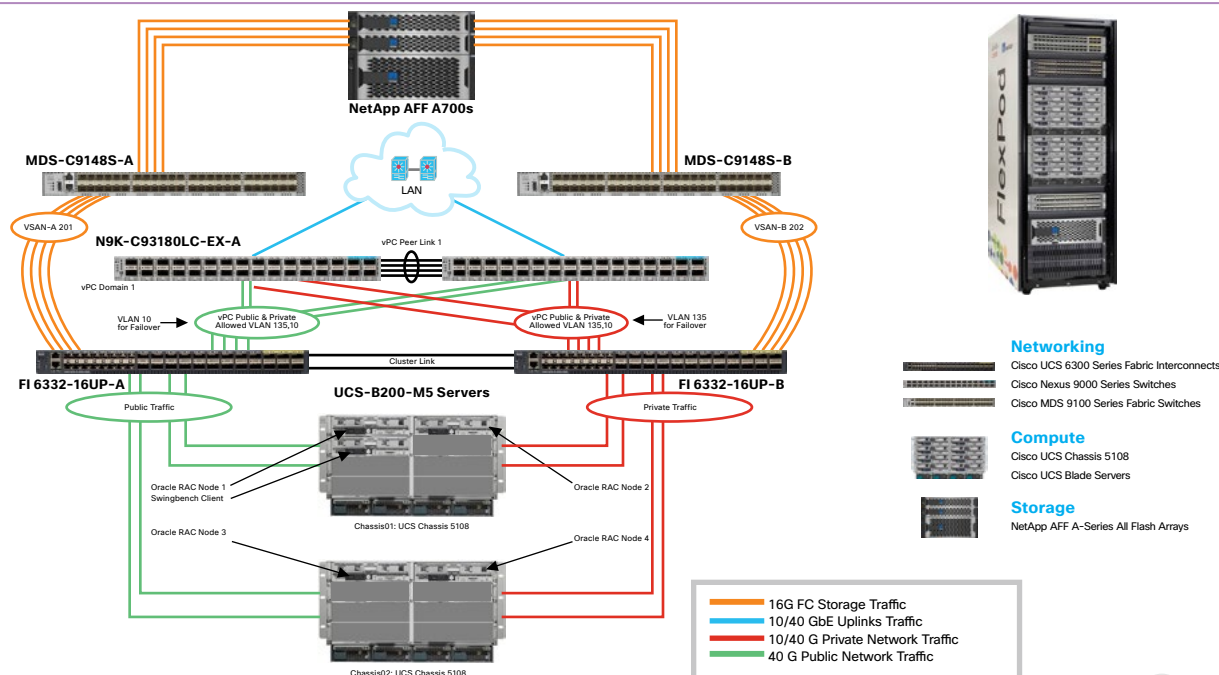
BUSINESS CHALLENGES

- 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 databases
- Oracle RAC must exude the highest level of flexibility, performance, scalability and resilience
- Time consuming, convoluted, expensive application deployment

SUMMARY

- Integrated compute, network & storage solution
- High-performance, scalable, and resilient system
- 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
- Faster deployments, greater flexibility of choice, efficiency, high availability and lower risk

ARCHITECTURE





FlashStack Data Center with Oracle RAC 12cR2 Database on Pure Storage FlashBlade

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

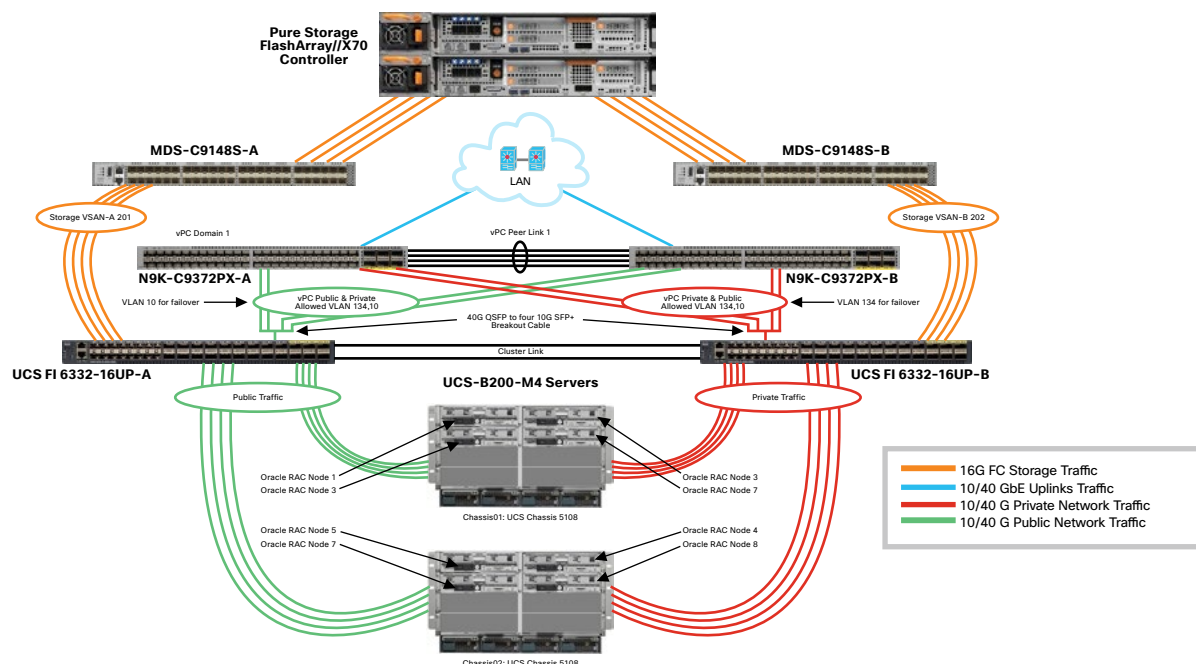
BUSINESS CHALLENGES

- New design targets a variety of scale-out application demands for database consolidation, management, and seamless data 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





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
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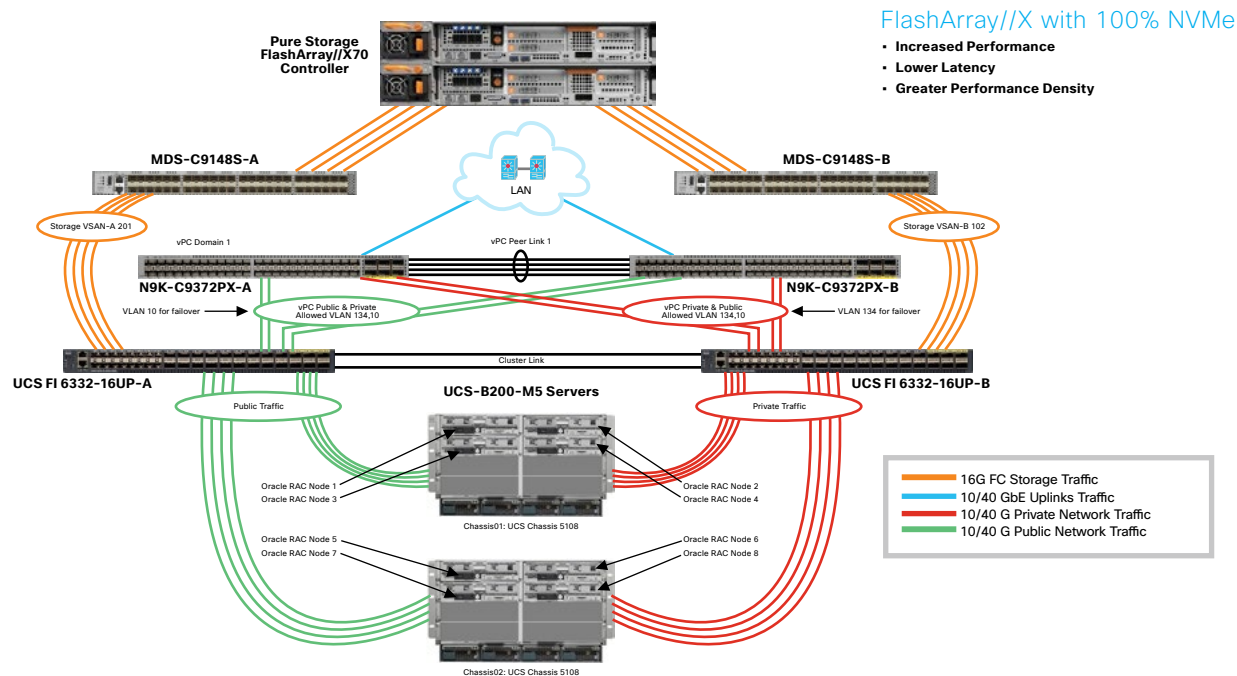
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SUMMARY

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ARCHITECTURE





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

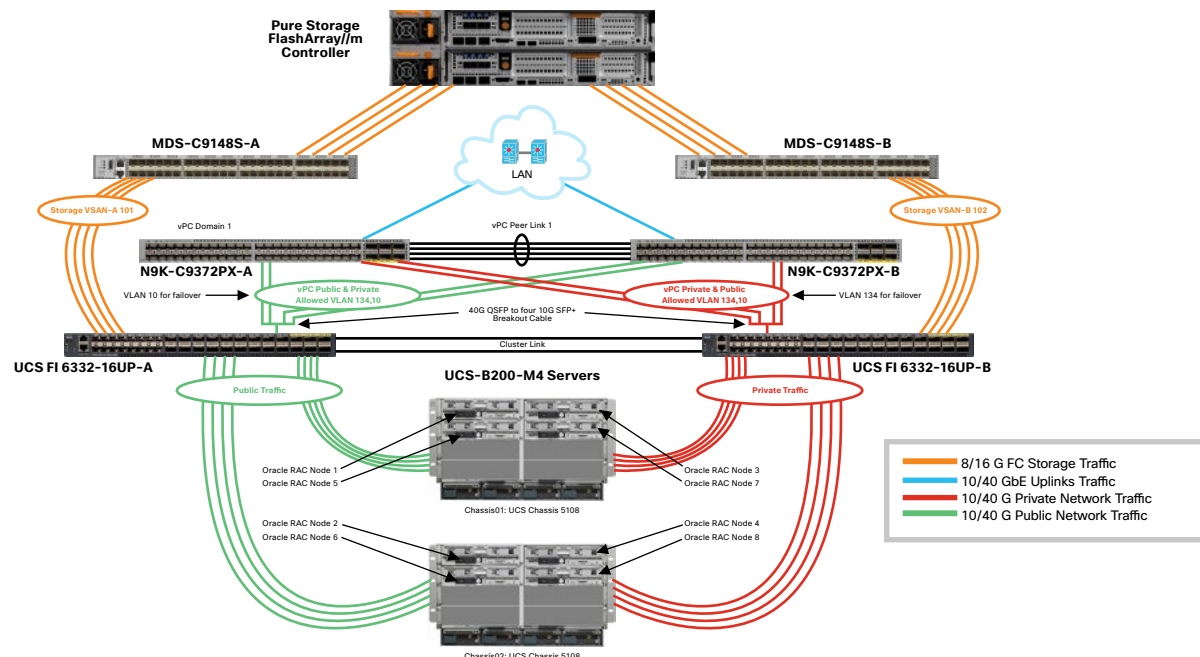
BUSINESS CHALLENGES

- 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





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

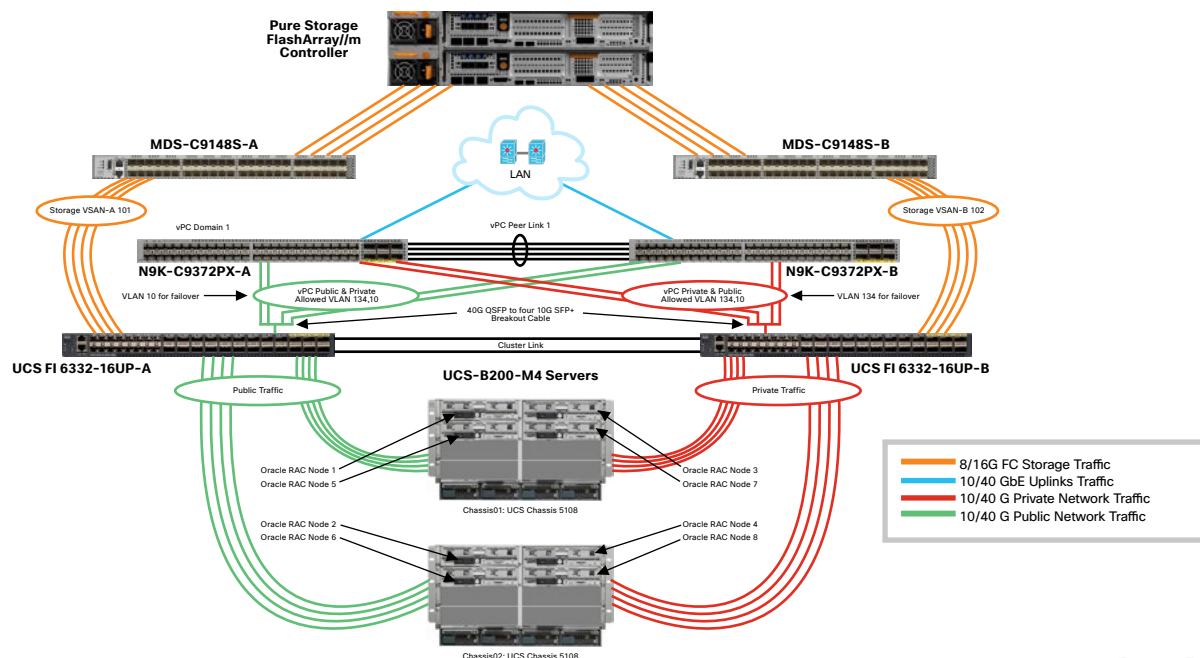
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- Guarantee customer success with pre-built, pre-tested drivers, Oracle database software

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





Applications

MICROSOFT

VMware

- FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5
- 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.



FlexPod Datacenter with Microsoft SQL Server 2016 and VMware vSphere 6.5

TECHNICAL HIGHLIGHTS

- Scalable Architecture
- 40GE End-to-End iSCSI Connectivity
- NetApp AFF300 Series Storage
- MS SQL Server 2016
- Nexus 9000 Series
- vSphere 6.5 Virtualization Platform
- High Availability with VMware

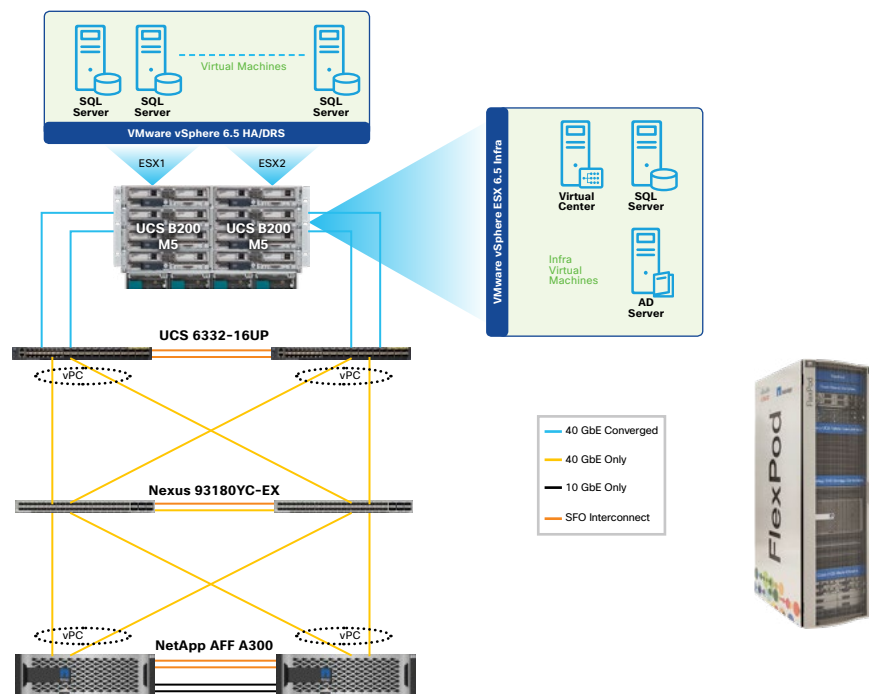
BUSINESS CHALLENGES

- Non-Standardization and decentralization SQL Server Databases
- Slow, complex, expensive SQL application deployments
- Scalability and performance Challenges
- Business Continuity challenges due to growing environment complexity
- Reduce the number of management domains - data center agility

SUMMARY

- To simplify the design and deployment of MS SQL server on a virtualized FlexPod Infrastructure
- Maximize hardware utilization, reducing sprawl, power and cooling costs by consolidation
- Virtualizing SQL server on the FlexPod (All Flash storage) infrastructure meets the most demanding customers' workloads
- UCS "Service Profile" approach helps in deploying servers/solutions quickly & effectively.

ARCHITECTURE





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 5.1 virtualization platform
- Microsoft Exchange 2013

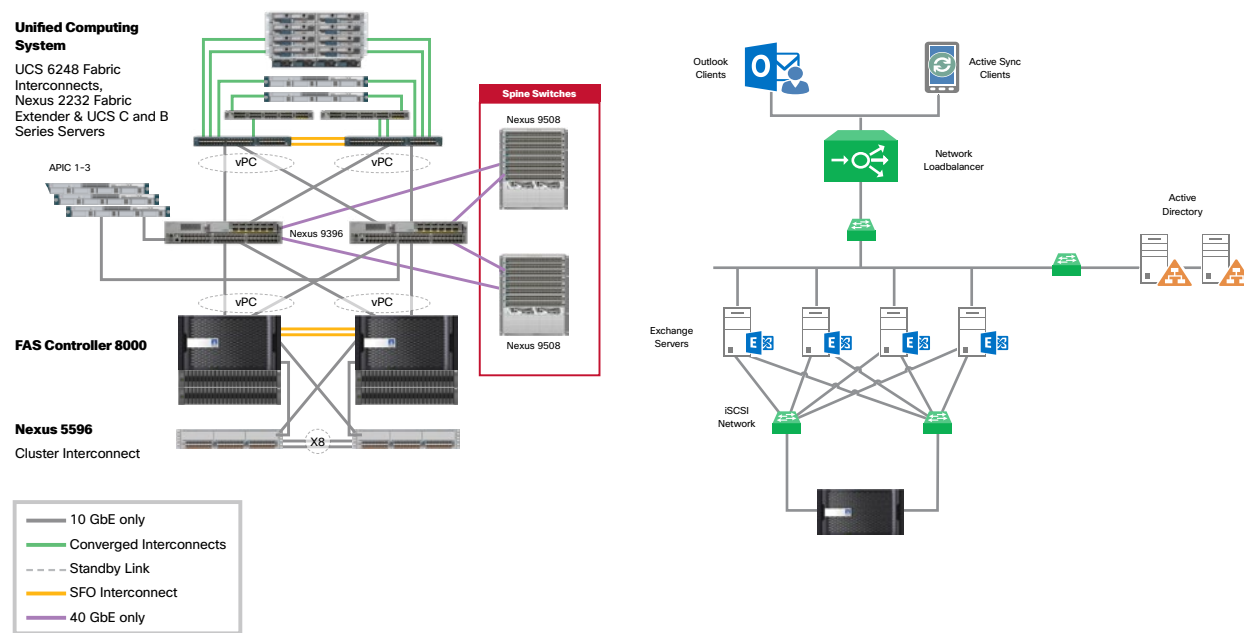
BUSINESS CHALLENGES

- 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





Applications

MICROSOFT

Microsoft

- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V - **New**
- Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware - **New**

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Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with MS Hyper-V

TECHNICAL HIGHLIGHTS

- HyperFlex 3.5 cluster with Hyper-V
- 4 x HXAF240c M5 Nodes
- Windows Server 2016 and MS SQL Server 2016 SP1
- Cisco UCSM 4.0 (1b)
- 2x Cisco Nexus 9396PX

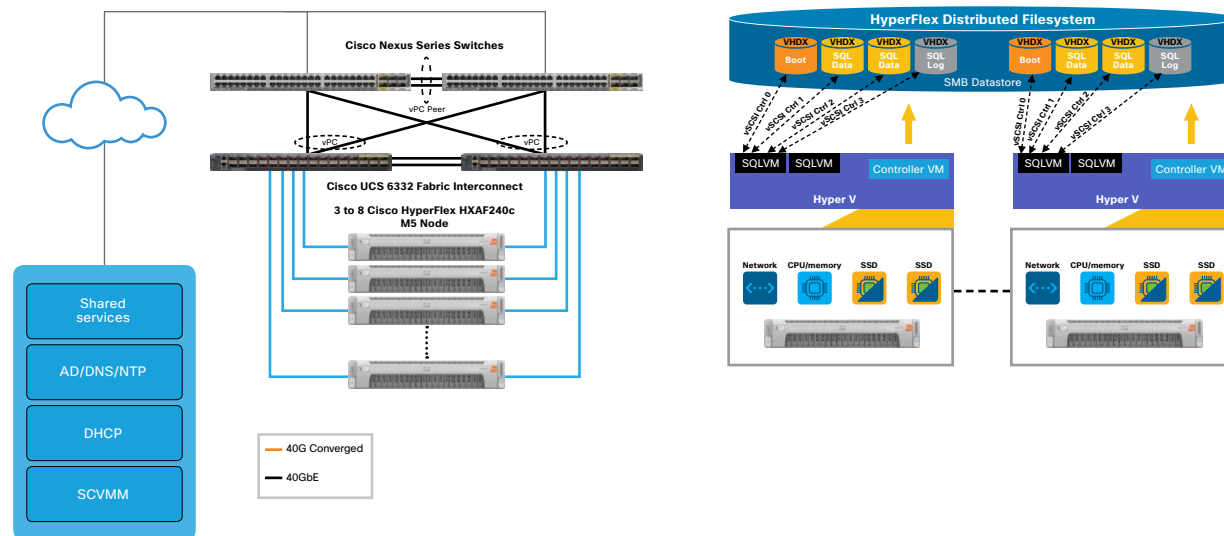
SUMMARY

- Deployment best practices for hosting MS SQL databases on HyperFlex All Flash Systems with Windows Hyper-V.
- HA deployment options - Always On Availability Group.
- Test and performance validation of OLTP database workloads and DB maintenance tasks

BUSINESS CHALLENGES

- MS SQL Servers on standalone servers causing database sprawl
- MS SQL Server 2008 End-of-Support
- Underutilized servers in traditional infrastructure.
- Siloed and disintegrated management in traditional infrastructure
- Virtualization license/cost challenges

ARCHITECTURE





Cisco HyperFlex 3.5 All-Flash Systems for Deploying Microsoft SQL Server with VMware

TECHNICAL HIGHLIGHTS

- HyperFlex 3.5 cluster with VMware ESXi 6.5
- 4 x HXAF240c M5 Nodes
- Windows Server 2016 and MS SQL Server 2016 SP1
- Cisco UCSM 4.0 (1b)
- 2x Cisco Nexus 9396PX
- HX Stretched Cluster

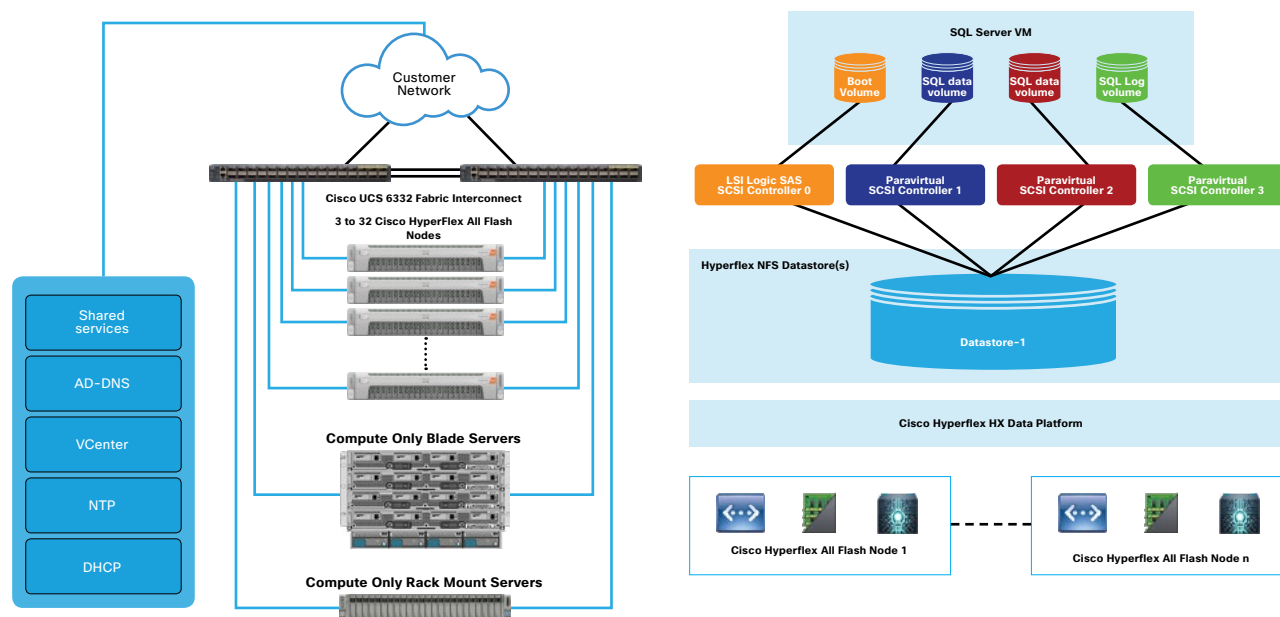
SUMMARY

- Deployment best practices for hosting MS SQL databases on HyperFlex All Flash Systems with VMware ESXi.
- HA deployment options – Always On Availability Group.
- Test and performance validation of OLTP database workloads and DB maintenance tasks
- Stretch Cluster deployment & validation for disaster recovery

BUSINESS CHALLENGES

- MS SQL Servers on standalone servers causing database sprawl
- MS SQL Server 2008 End-of-Support
- Underutilized servers in traditional infrastructure
- Siloed and disintegrated management in traditional infrastructure

ARCHITECTURE





Applications

SAP

- Cisco and Hitachi Adaptive Solutions for SAP HANA TDI - **New**
- FlashStack for SAP HANA TDI - **New**
- FlexPod Datacenter with Cisco ACI for SAP HANA - **New**
- FlexPod Datacenter for SAP Solution with IP-Based Storage using NetApp AFF A-Series
- Cisco UCS Integrated Infrastructure for SAP HANA

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 and Hitachi Adaptive Solutions for SAP HANA TDI

TECHNICAL HIGHLIGHTS

- Supports Cisco blade series servers B200 and B480 with all SAP supported Memory config
- Design document multiple OS SLES 12 SP4 and RHEL 7.5
- Design Supports Hitachi VSP Series storage.
- Provides detailed deployment guide for SAP HANA, SAP BW powered by SAP HANA, SAP Business Suite powered by SAP HANA, SAP Business Suite powered by SAP HANA, S/4HANA scenarios

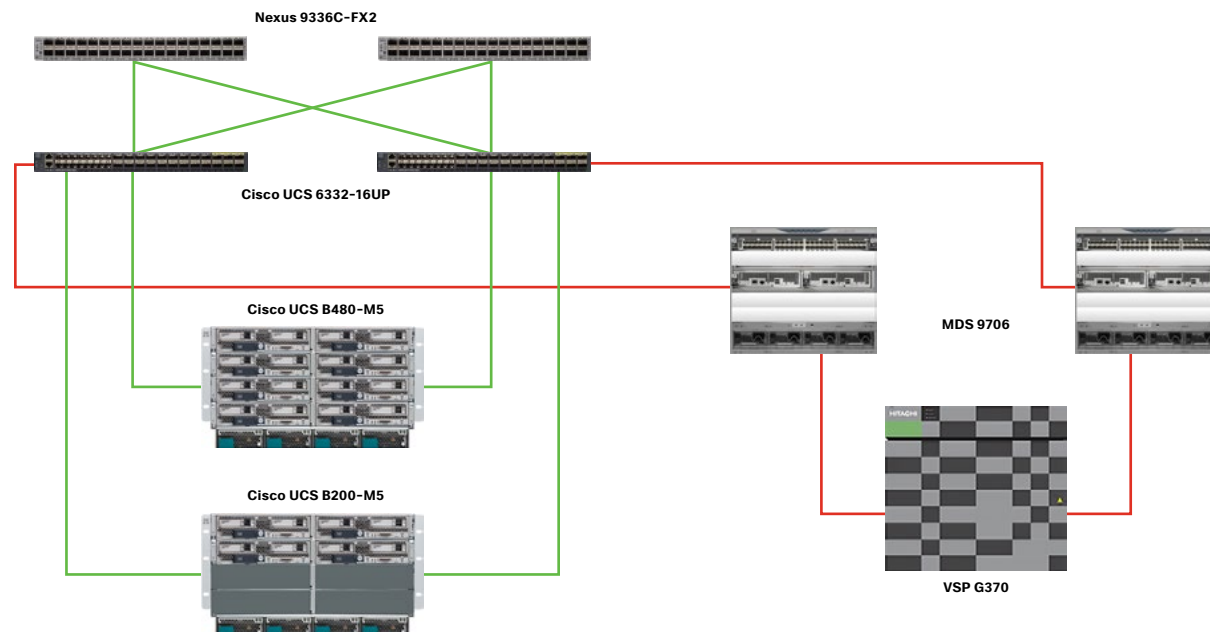
BUSINESS CHALLENGES

- Need for scalable and reliable infrastructure that can be implemented in an intelligent, policy driven manner
- Need for secured multi-tenancy across Compute, Network and Storage
- Need for proven end-to-end implementation of SAP HANA with resilient, agile, flexible infrastructure

SUMMARY

- The solution is designed and validated using compute, network and storage best practices for high performance, scalability, and resiliency throughout the architecture.
- Run mission-critical applications efficiently by independently and automatically scaling compute and storage
- Unify and automate the control of server, network, and storage components to simplify resource provisioning and maintenance.

ARCHITECTURE





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 with newer Purity RUN platform enabled WFS based NFS services providing for HANA shared filesystem .

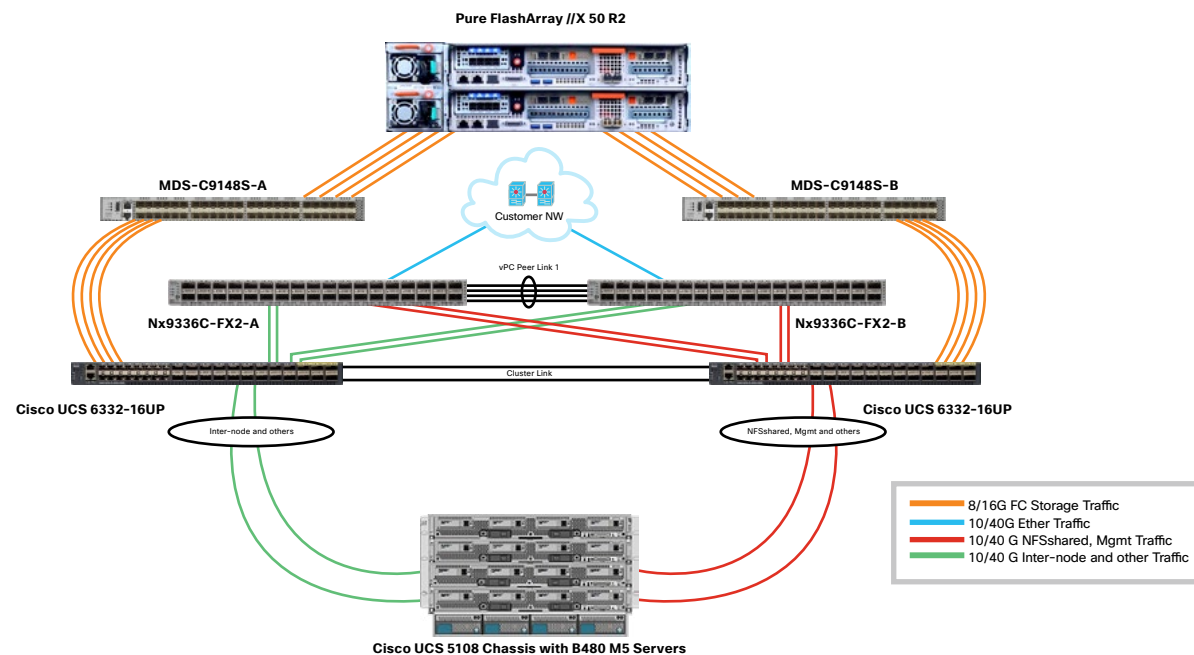
BUSINESS CHALLENGES

- 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





FlexPod Datacenter with Cisco ACI for SAP HANA

TECHNICAL HIGHLIGHTS

- Cisco UCS 6332 Fabric Interconnects running UCSM 3.2 , Cisco Nexus 9000 series ACI switches with 3-node APIC cluster 3.2(2l)
- NetApp AFF-A300 providing 40 GE end-to-end IP connectivity with NFS and iSCSI options for boot as well as HANA persistence layer.
- SAP HANA single host and scale-out implementation examples.

BUSINESS CHALLENGES

- Reduce time to deployment of business critical applications like SAP HANA
- Ease infrastructure deployment and management burdens
- Industry trends of management automation and dynamic workload provisioning

SUMMARY

- Converged infrastructure for the NextGen Data Center with FlexPod and Application driven policy based approach to Solution deployment with Cisco ACI.
- High performance, scalable and resilient and multi-tenant network infrastructure centrally managed and configured.

ARCHITECTURE

Cisco UCS
5108 B-Series Blade Chassis
2304 Chassis FEX Modules
B480 M5 Blade Servers

Cisco UCS
5108 B-Series Blade Chassis
2304 Chassis FEX Modules
B200 M5 Blade Servers

Cisco UCS
C480 M5 Rack Server(s)

Cisco UCS C240 M5
Rack Server(s)

Cisco UCS C220 M5
Rack Server(s)

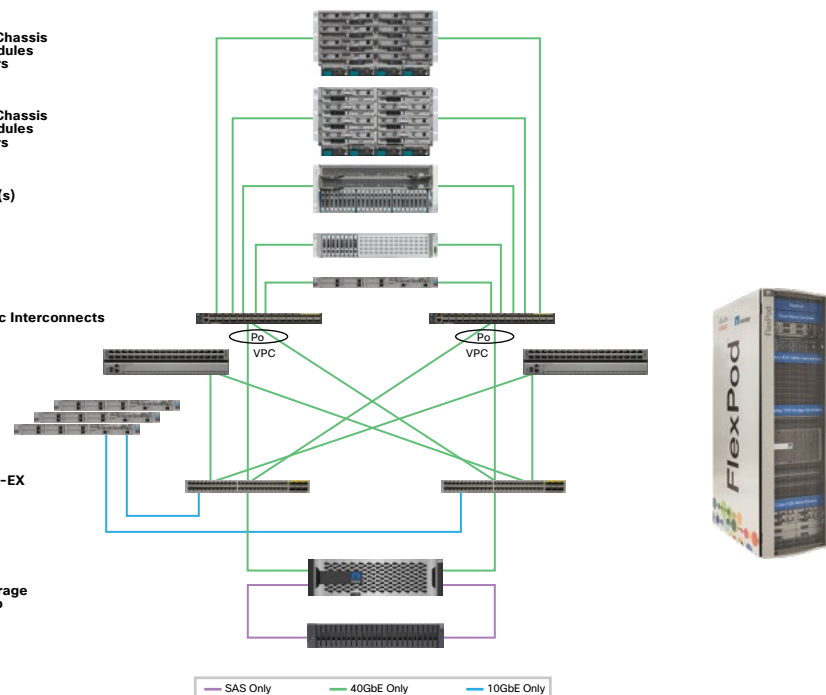
Cisco UCS 6332 Fabric Interconnects

Cisco Nexus 9336PQ
Spine Switches

Cisco ACI APIC
Controllers

Cisco Nexus 93180LC-EX
Leaf Switches

NetApp AFF A300 Storage
Controllers w/ NetApp
DS224C Disc Shelves





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

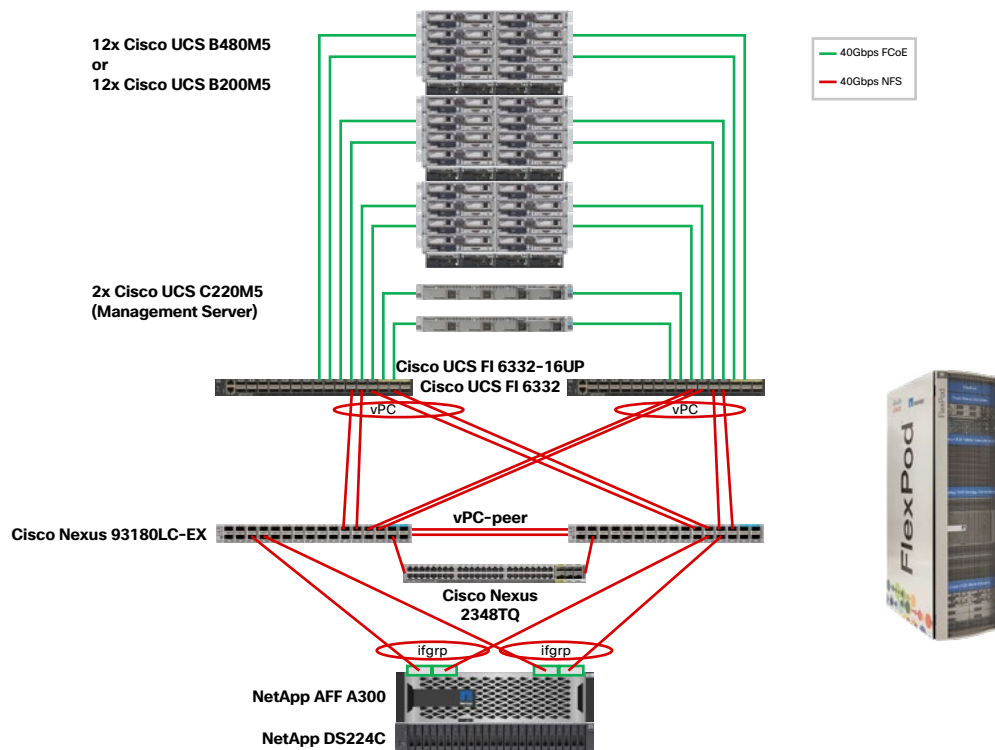
BUSINESS CHALLENGES

- 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





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

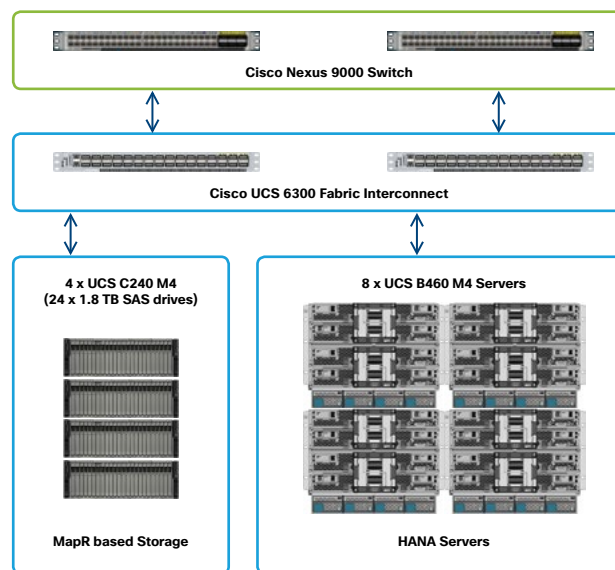
BUSINESS CHALLENGES

- 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 MAPR: 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: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucsii_saphana_rhel.html



Applications

VIRTUAL CLIENT COMPUTING

Citrix: VMware

- FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 Citrix XenDesktop 7.x Users
- FlexPod Datacenter with UCS, NetApp All Flash FAS, and Citrix XenApp/XenDesktop 7.7
- 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.



FlexPod Datacenter with Citrix XenDesktop/XenApp 7.15 and VMware vSphere 6.5 Update 1 for 6000 Seats

TECHNICAL HIGHLIGHTS

- Scalable architecture with UCS B200 M5 Chassis
- 5,000 Mixed RDSH & VDI users Instant and Full Clone combined and Infrastructure Servers in four 5108 Blade Server Chassis
- 5000 Combined RDS Hosted Server Sessions & VDI users, Cisco Hardware, 3rd Gen 6300, 40GBE FIs, Nexus Switches, 9148S MDS Switch 16 Gb FC, NetApp AFF A300 Storage System in 42 RU single rack solution
- Performance study with simulations of RDS Hosted Server Sessions & VDI Instant non-persistent Clones & Full Clone persistent desktop workloads running knowledge worker workload

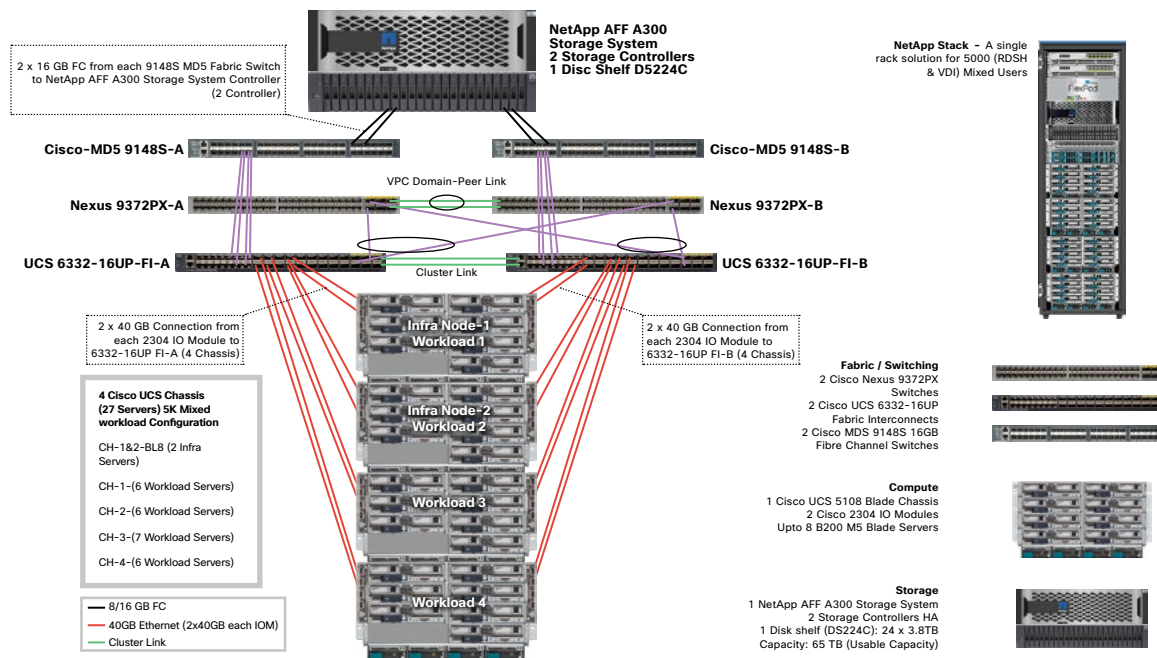
BUSINESS CHALLENGES

- Typical VMware Horizon 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 RDSH & VDI solutions
- Different VDI end users (Non Persistent & Persistent and RDSH Server Sessions Users) connecting to newer/variety of end point devices

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 & VDI Users on cluster level and 5000 users mixed workload level
- FlexPod all flash storage technology delivering 16 GB FC/ 10 GB FCoE/ 10/40 GB NFS
- Converged Infrastructure for the NextGen Data Center

ARCHITECTURE





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

TECHNICAL HIGHLIGHTS

- 16 UCS HXAF220-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

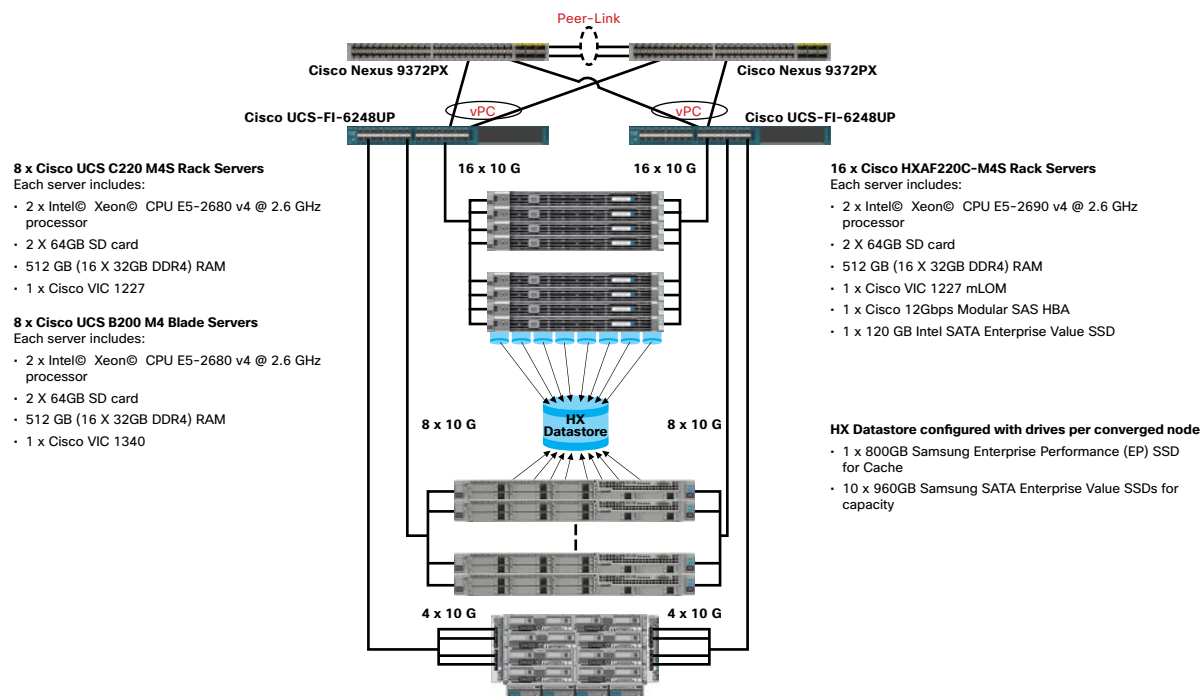
BUSINESS CHALLENGES

- 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





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

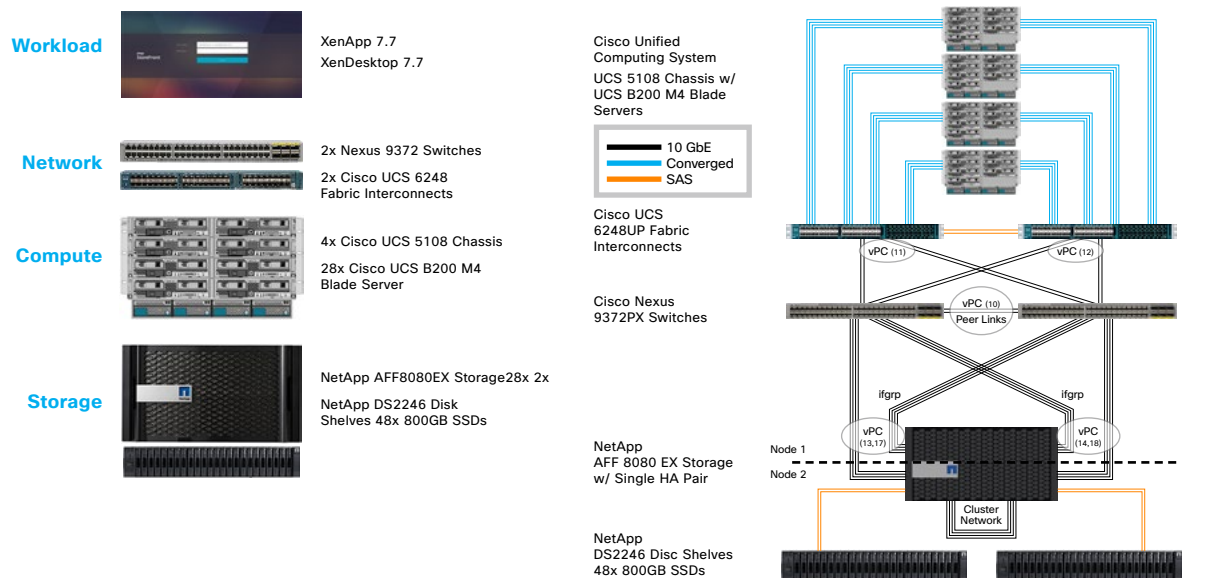
BUSINESS CHALLENGES

- 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





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

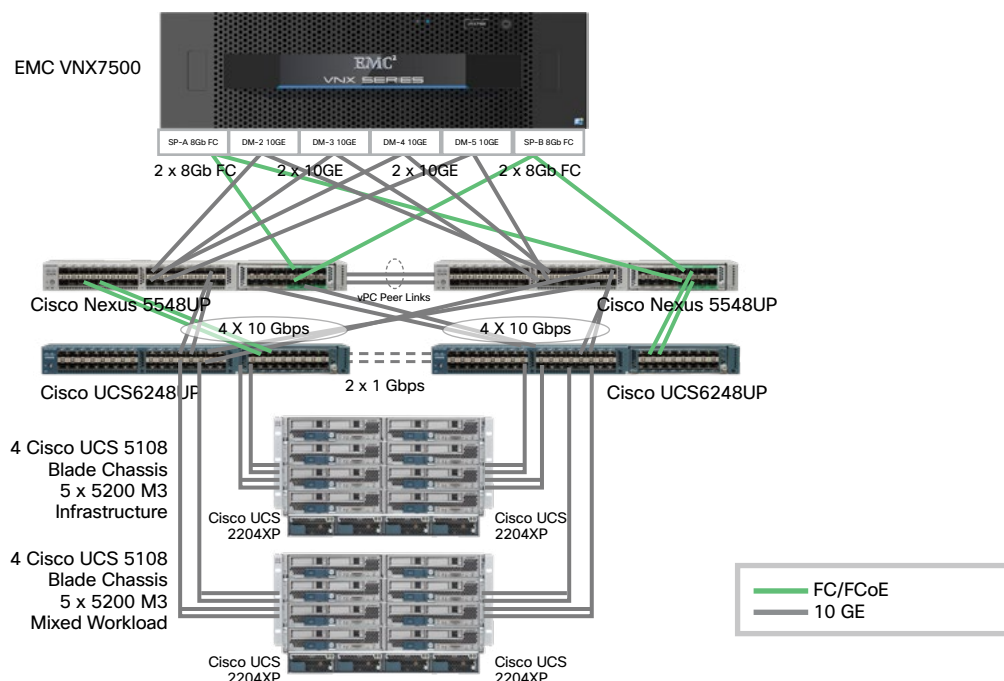
BUSINESS CHALLENGES

- 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





Applications

VIRTUAL CLIENT COMPUTING

Citrix: Citrix

- Cisco HyperFlex 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users - **New**
- Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users
- Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop
- 1250 Users on FlashStack a Cisco UCS Mini and Pure //m10, with Citrix XenDesktop and XenApp 7.15
- 5000 Seat Mixed Workload FlashStack Solution with XenDesktop 7.9 on ESXi 6.0U2

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 3.5 All-Flash Systems with up to 2000 Citrix Virtual Apps and Desktop Users

TECHNICAL HIGHLIGHTS

- 8x UCS HX220-M5S rack servers, & 8x B200M5 servers for compute (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.5.1a, UCSM 4.0.1(b)
- Citrix Virtual Apps & Desktops 1808
- Vmware ESXi 6.5

BUSINESS CHALLENGES

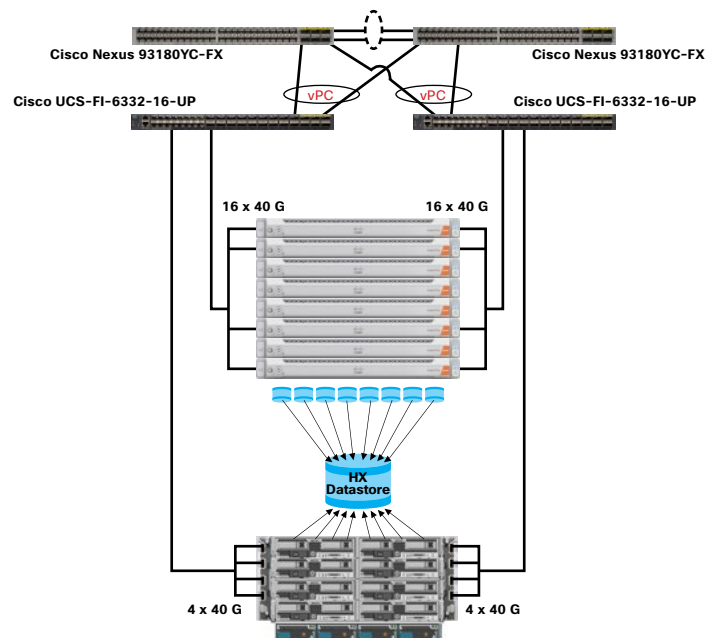
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex All-Flash system for Citrix Virtual Desktop 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 Citrix Virtual Apps and Desktops, Single UCS Domain Reference Architecture



8 x Cisco HXAF220C-M5SX or Cisco HXAF240C-M5SX Rack Servers

Each Server Includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz
- 240GB M.2 SATA SSD
- 768 GB (24 x 32GB DDR4) RAM @ 2666 MHz
- 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

8 x Cisco UCS B200 M5 Blade Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (24 x 32GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





Cisco HyperFlex M5 All-Flash Hyperconverged System with up to 600 Citrix XenDesktop Users

TECHNICAL HIGHLIGHTS

- 4 UCS HXAF220-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1b, UCSM 3.2(2d)
- XenDesktop 7.16
- VMware vSphere 6.5 U1

BUSINESS CHALLENGES

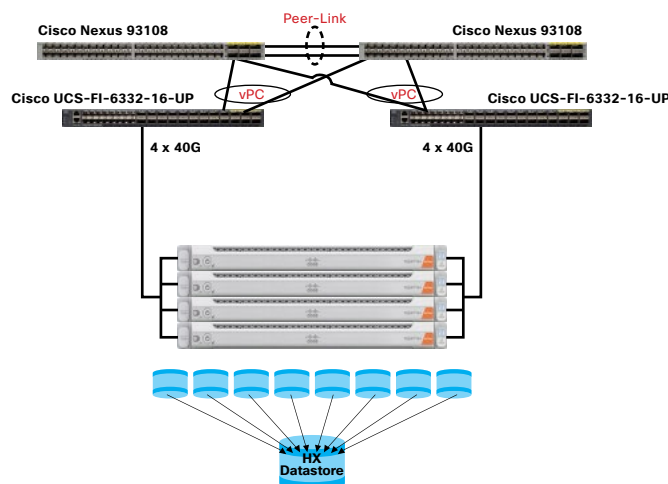
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of 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 Citrix XenDesktop 7.16, 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
- 120GB 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





Cisco HyperFlex M5 All-Flash Hyperconverged System with Hyper-V 2016 and Citrix XenDesktop

TECHNICAL HIGHLIGHTS

- 4 UCS HXAF220C-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1a, UCSM 3.2(2d)
- XenDesktop 7.17
- Microsoft Hyper-V 2016

BUSINESS CHALLENGES

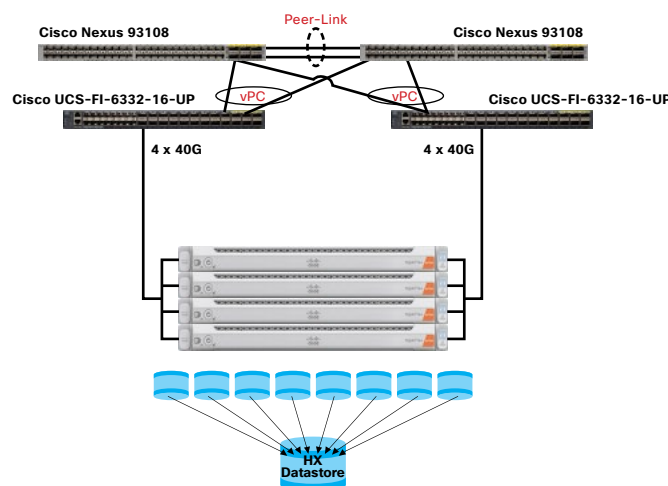
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience
- Best practices for installation and Deployment of Cisco HyperFlex All-Flash system for Citrix XenDesktop turned 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 Citrix XenDesktop 7.16, 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
- 120GB 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





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

TECHNICAL HIGHLIGHTS

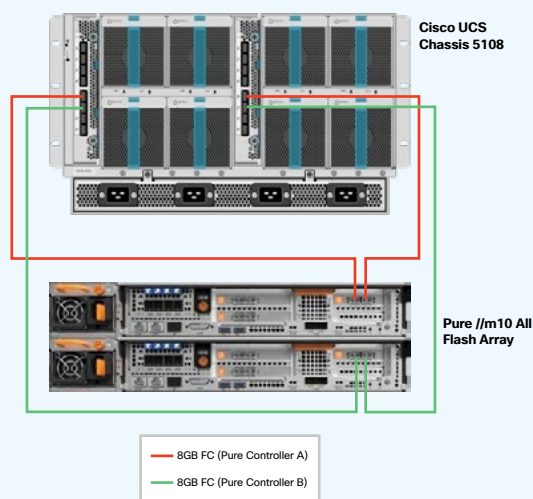
- Simple architecture with UCS B Series Servers
- High performance SAN for desktop workloads
- 1250 users per FlashStack Mini solution
- Performance study with simulations of typical desktop workloads

SUMMARY

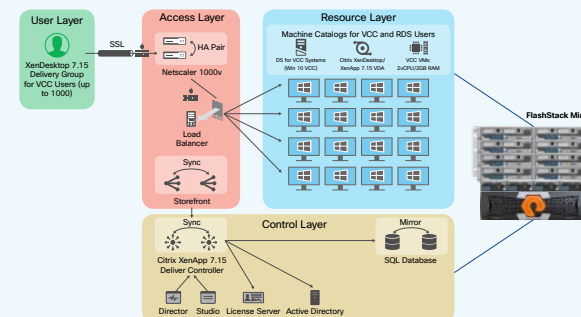
- High performance and scalability with simplicity
- UCS “Service Profile” approach helps faster flexible deployments in short notice
- Small footprint for SMB

ARCHITECTURE

Physical Architecture



Logical Architecture



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





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

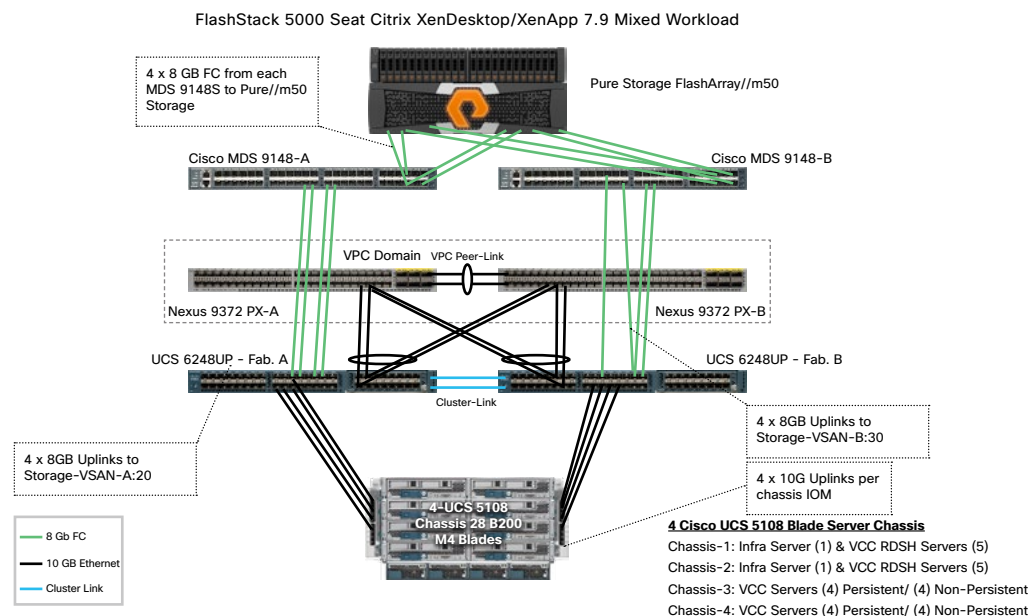
BUSINESS CHALLENGES

- 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





Applications

VIRTUAL CLIENT COMPUTING

VMW View

- Cisco HyperFlex 3.5 All-Flash System with Horizon 7.6 up to 4400 users - **New**
- FlashStack Data Center with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats - **New**
- FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5U1 for 5000 Seats
- Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users
- FlashStack Data Center with VMware Horizon 7.4 for 6000 seats
- Cisco HyperFlex All-Flash Hyperconverged System with up to 4000 VMware Horizon 7 Users
- Cisco HyperFlex All-Flash Hyperconverged System with up to 600 VMware Horizon 7 Users
- 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 3.5 All-Flash System with Horizon 7.6 up to 4400 users

TECHNICAL HIGHLIGHTS

- 32 Node All Flash Hyperflex Solution: 16 UCS HXAF220C-M5SX rack servers and 8 UCS 220C-M5 rack servers + 8 UCS B200 M5 blade servers (n+1 cluster) with scale out option in a single UCS domain
- Cisco HyperFlex v3.5(1a), UCSM 4.0(1b)
- Nexus 93180 YC switches,
- VMware vSphere 6.5.2.U2, VMware Horizon 7 .6
- 4400 User Windows Server 2016 RDS Sessions & Windows 10 mixed Knowledge Worker workload density.

BUSINESS CHALLENGES

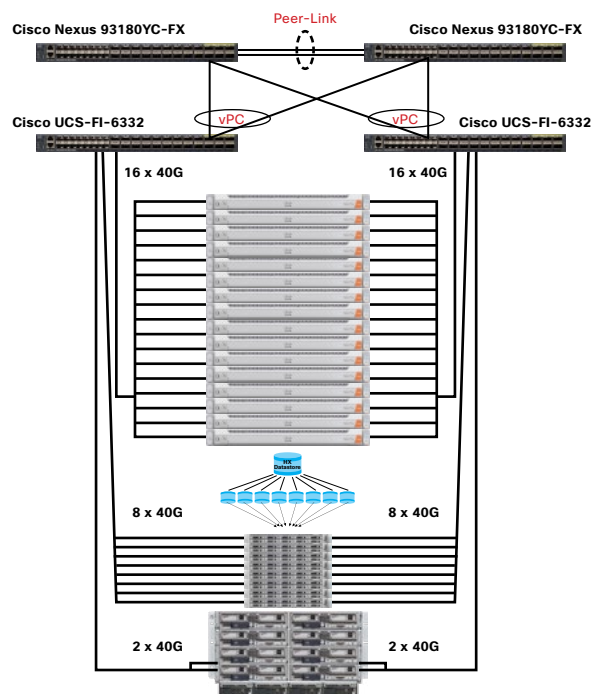
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability.

SUMMARY

- All Flash HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment
- Very good sub mil second knowledge worker workload End User Experience

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Full Scale Single UCS Domain Reference Architecture



16 x Cisco HXAF C220-M55X Rack Servers

Each Server Includes:

- 2x Intel Xeon Gold 6140 Scalable family processor @ 2.3 GHz
- 240GB M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666 MHz
- 1 x Cisco VIC 1387 mLOM
- 1 x Cisco 12 GBPs 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

8 x Cisco UCS C220 M5 Rack Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1387

8 x Cisco UCS B200 M5 Blade Servers

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120Gb M.2 SATA SSD
- 768 GB (12 x 64GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





FlashStack Data Center with VMware Horizon 7.4 and VMware vSphere 6.5 U1 Cisco UCS Manager 3.2 for 6000 Seats

TECHNICAL HIGHLIGHTS

- 30 UCS B200 M5 Blade Servers, (n+1) with scale out option in a single UCS domain
- Cisco UCSM 3.2(2f)
- VMware Horizon 7.4
- VMware vSphere 6.5 U1
- Pure Storage FlashArray //X70 with All-NVMe DirectFlash Modules
- Purity v5.0.2

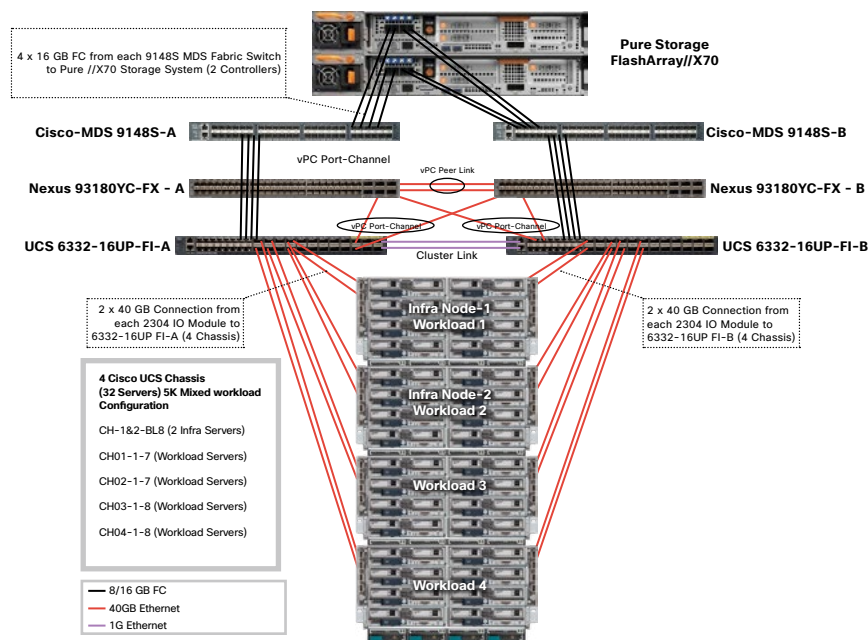
BUSINESS CHALLENGES

- 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 VDI and RDSH solutions

SUMMARY

- High density with a small footprint supporting mixed users workloads
- Very good end user experience on cluster level and 6000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability
- Investment protection in high density and high performance data center environments

ARCHITECTURE





FlexPod Datacenter with VMware Horizon View 7.3 and VMware vSphere 6.5U1 for 5000 Seats



TECHNICAL HIGHLIGHTS

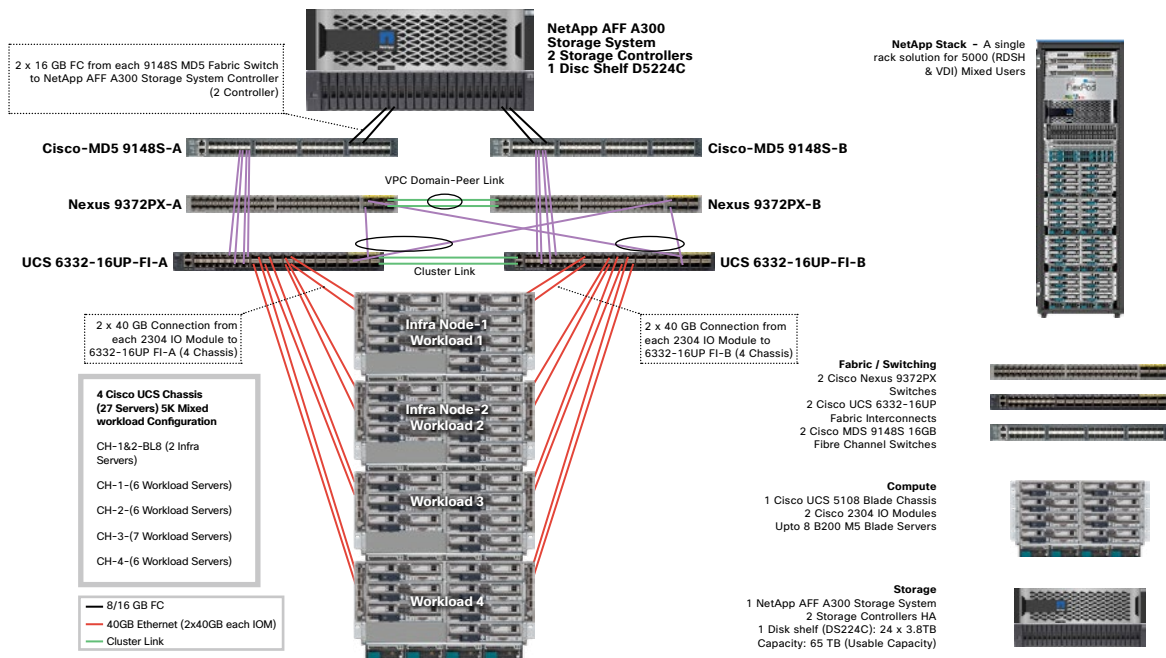
- Scalable architecture with UCS B200 M5 Chassis
- 5,000 Mixed RDSH & VDI users Instant and Full Clone combined and Infrastructure Servers in four 5108 Blade Server Chassis
- 5000 Combined RDS Hosted Server Sessions & VDI users, Cisco Hardware, 3rd Gen 6300 , 40GBE Fls, Nexus Switches, 9148S MDS Switch 16 Gb FC, NetApp AFF A300 Storage System in 42 RU single rack solution
- Performance study with simulations of RDS Hosted Server Sessions & VDI Instant non-persistent Clones & Full Clone persistent desktop workloads running knowledge worker workload



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 & VDI Users on cluster level and 5000 users mixed workload level
- FlexPod all flash storage technology delivering 16 GB FC/ 10 GB FCoE/ 10/40 GB NFS
- Converged Infrastructure for the NextGen Data Center

ARCHITECTURE



BUSINESS CHALLENGES

- Typical VMware Horizon 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 RDSH & VDI solutions
- Different VDI end users (Non Persistent & Persistent and RDSH Server Sessions Users) connecting to newer/variety of end point devices





Cisco HyperFlex All-Flash Hyperconverged System with up to 2000 VMware Horizon 7 Users

TECHNICAL HIGHLIGHTS

- 8 UCS HXAF220C-M5SX rack servers and 8 UCS B200 M5 blade server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 3.0.1a, UCSM 3.2(3a)
- Nexus 93180 YC switches
- VMware vSphere 6.5 VMware Horizon 7
- 2000 User Windows 10 & Server 2016 RDSH sessions mixed Knowledge Worker workload density.

BUSINESS CHALLENGES

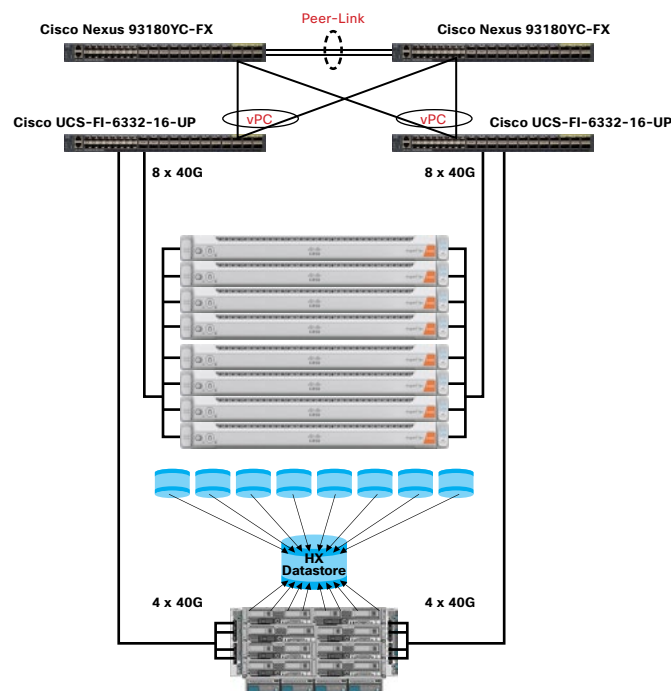
- Highly scalable architecture designed to meet scale-out application (VDI) demands with seamless datacenter integration and management, Energy efficiency.
- Enterprise-grade Virtual Desktop Infrastructure solution with excellent End User Experience.
- Best practices for installation and Deployment of Cisco HyperFlex for VMware Horizon 7 tuned for performance and scalability.

SUMMARY

- All Flash HyperConverged infrastructure based on Cisco HyperFlex
- Investment protection in high density and high performance data center environments
- High performance, scalable and resilient virtual environment
- Very good sub mil second knowledge worker workload End User Experience

ARCHITECTURE

Cisco HyperFlex and VMware Horizon 7, Full Scale UCS Domain Reference Architecture



8 x Cisco HXAF220C-M5SX

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 240GB M.2 SATA SSD
- 768 GB (24 X 32GB DDR4) RAM @ 2666MHz
- 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

8 x Cisco UCS B200 M5 Blade Servers Each server includes:

Each server includes:

- 2 x Intel® Xeon® Gold 6140 scalable family processor @ 2.3 GHz processor
- 120GB M.2 SATA SSD
- 768 GB (24 X 32GB DDR4) RAM @ 2666MHz
- 1 x Cisco VIC 1340





FlashStack Data Center with VMware Horizon 7.4 for 6000 Seats

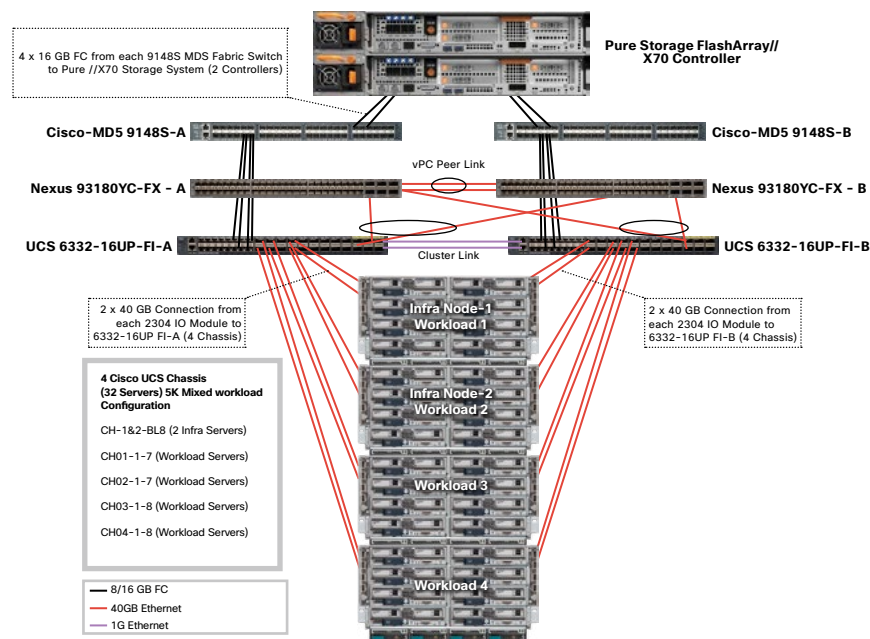
TECHNICAL HIGHLIGHTS

- 30 UCS B200 M5 Blade Servers, (n+1) with scale out option in a single UCS domain
- Cisco UCSM 3.2(2f)
- VMware Horizon 7.4
- VMware vSphere 6.5 U1
- Pure Storage FlashArray //X70 with All-NVMe DirectFlash Modules
- Purity v5.0.2

SUMMARY

- High density with a small footprint supporting mixed users workloads
- Very good end user experience on cluster level and 6000 users mixed workload testing
- Live storage migration/upgrade or controller failure with no business disruption resilient capability
- Investment protection in high density and high performance data center environments

ARCHITECTURE



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 VDI and RDSH solutions





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

TECHNICAL HIGHLIGHTS

- 16 UCS HXAF220-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

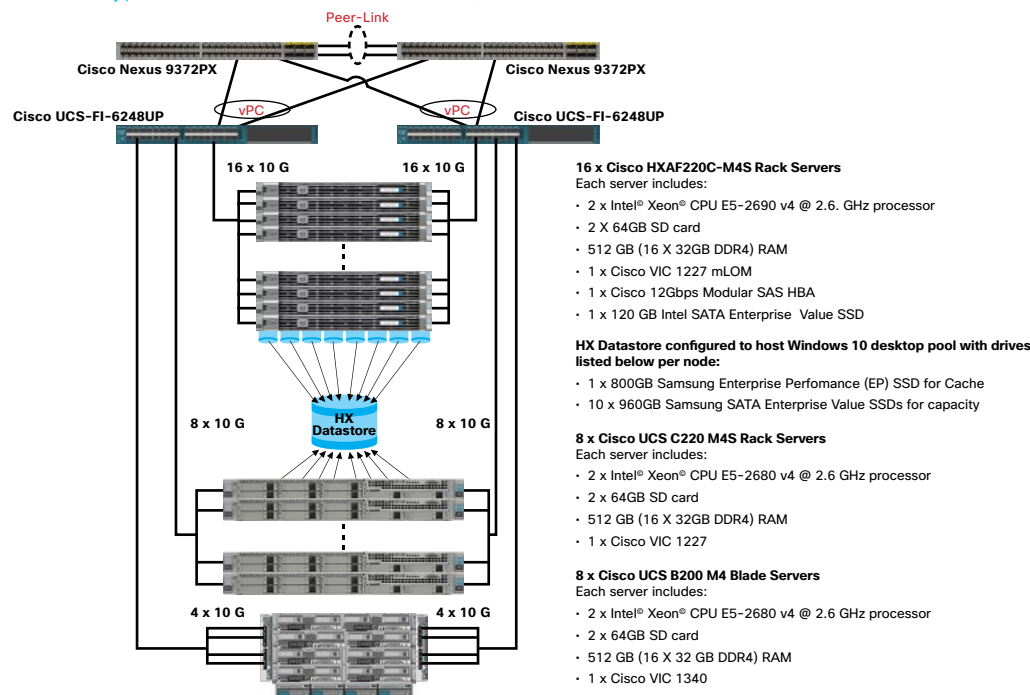
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless datacenter integration and management, and energy efficiency
- Enterprise-grade Virtual Client Computing solution with excellent end-user experience
- Best practices for installation and deployment of Cisco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





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

TECHNICAL HIGHLIGHTS

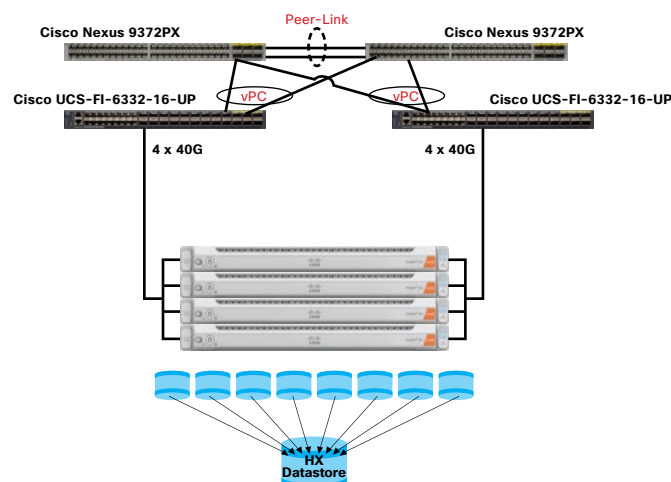
- 4 UCS HXAF220-M5S rack servers, M5 rack server (n+1) with scale out option in a single UCS domain
- Cisco HyperFlex 2.6.1a, UCSM 3.2(2b)
- VMware Horizon 7.3.1
- VMware vSphere 6.5 U1

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 HXAF220-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

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





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

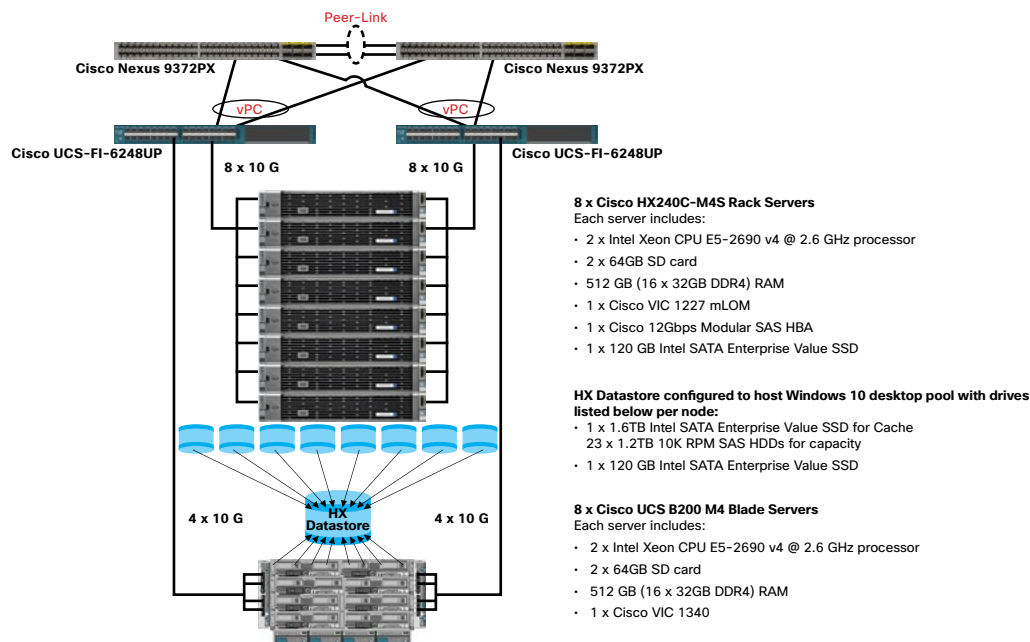
- Highly scalable architecture designed to meet scale-out application (VCC) demands with seamless data center integration and management, and energy efficiency
- Enterprise-grade virtual client computing solution with excellent end user experience
- Best practices for installation and deployment of Cisco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



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

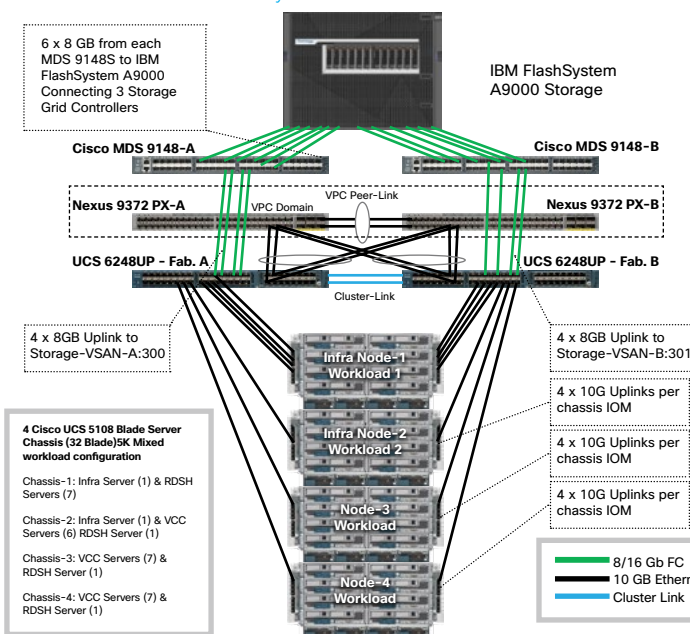


SUMMARY

- 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 x 1.2 TB MicroLatency Modules (21.44 TB Raw capacity)



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





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

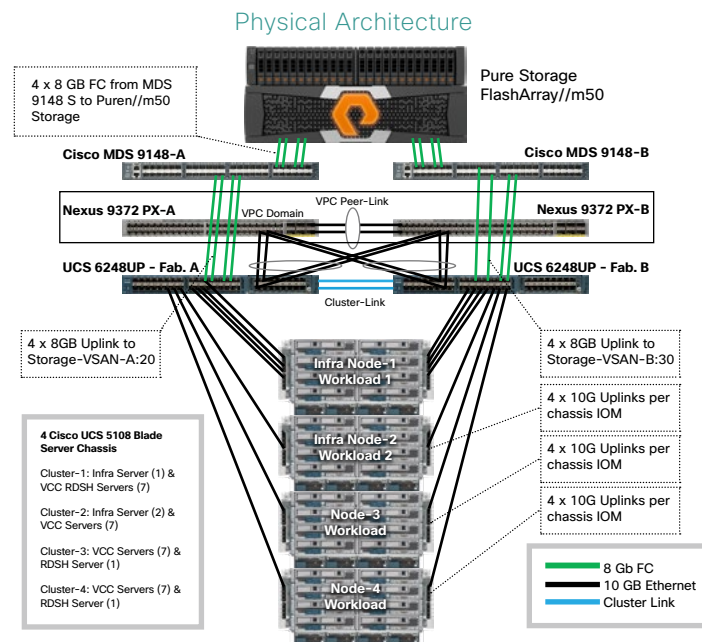
- Typical VMware Horizon View Desktops and RDS-hosted server sessions mixed workload combined users
- Rapid workload changes (mostly unpredictable) and hence high demand on quick H/W expansion flexibilities
- Demand density when proposing VCC and RDSH solutions



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



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 disk 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

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





Emerging Technologies

- Cisco UCS Infrastructure with Red Hat Openshift Container Platform on VMware vSphere - **New**
- Cisco UCS Infrastructure for Red Hat OpenShift Container Platform
- VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage
- Cisco UCS Infrastructure with Contiv and Docker Enterprise Edition for Container Management
- 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 Red Hat OpenShift Container Platform on VMware vSphere

TECHNICAL HIGHLIGHTS

- Powerful, web-scale container orchestration and management with Kubernetes
- Red Hat Enterprise Linux, running containers at scale with Security-enhanced Linux enabled for strong isolation
- Multi-tenant native SDN plugin in CNI mode for application pod network
- Virtualized Red Hat OpenShift Container Platform nodes with VMware vSphere HA.
- Persistent storage using Red Hat GlusterFS, running on Cisco UCS C240 M5 bare-metal nodes for stateful cloud-native container applications
- OpenShift Container Platform deployment including scale-out operations through Ansible Automation Engine
- End to end high available architecture from software stack to infrastructure stack

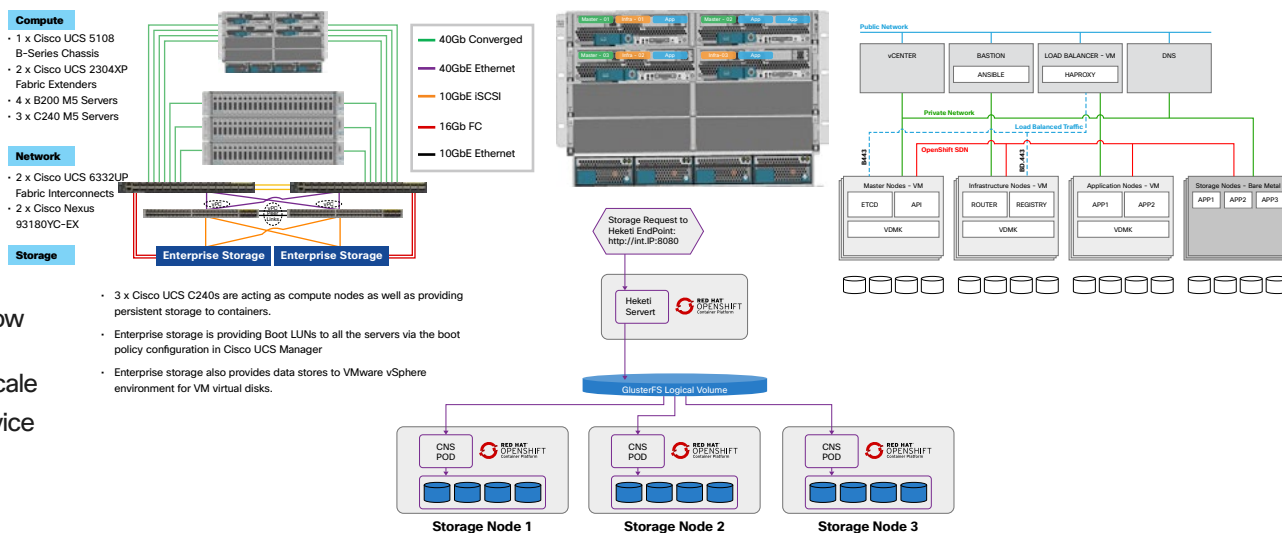
BUSINESS CHALLENGES

- Application portability across Dev/Test and Production environments
- Agile business application deployment workflow and turnaround time
- Optimal infrastructural resource utilization at scale
- Enterprise Grade Container & Associated Service Orchestrator
- Security, Isolation and Multi-tenancy

SUMMARY

- Simple, efficient and scalable solution for any converged/integrated stack
- Enterprise-grade Kubernetes with Red Hat OpenShift Container Platform on Cisco UCS Infrastructure with VMware vSphere
- Production-ready highly available PaaS solution for private cloud
- A very good starting point for Enterprise IT to move on to DevOps & CI/CD based application environment
- Cisco UCS providing the converged computing, network, and storage platform
- Open APIs driven infrastructure provisioning through automation

ARCHITECTURE



Cisco UCS Infrastructure for Red Hat OpenShift Container Platform



TECHNICAL HIGHLIGHTS

- Powerful, web-scale container orchestration and management with Kubernetes
- Integrated Red Hat Enterprise Linux Atomic Host, optimized for running containers at scale with Security enhanced Linux enabled for strong isolation
- Multi-tenant native SDN plugin in CNI mode for application pod network
- Persistent storage for stateful cloud-native container applications
- OpenShift Container Platform deployment including scale-out operations through Ansible Automation Engine
- Infrastructure automation with UCS Manager built-in capabilities
- End to end high available architecture from software stack to infrastructure stack



SUMMARY

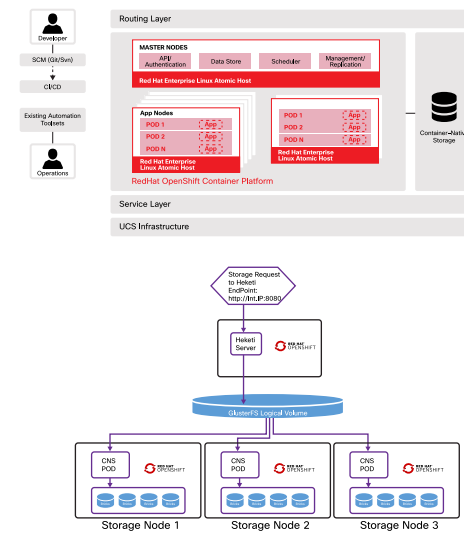
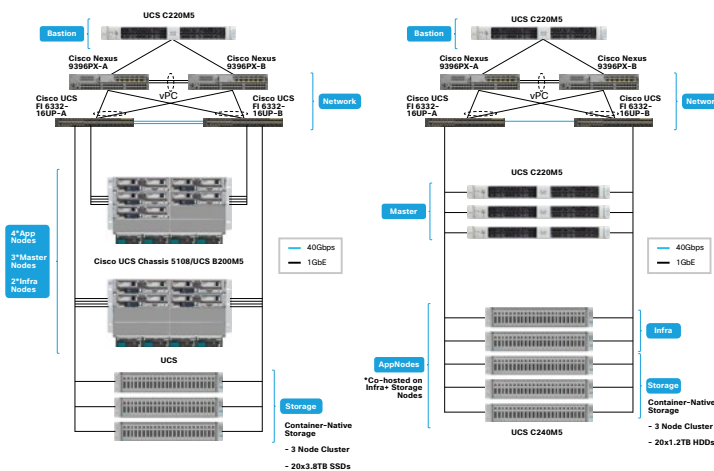
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- Enterprise-grade Kubernetes with Red Hat OpenShift Container Platform on Cisco UCS Infrastructure
- Production-ready highly available PaaS solution for private cloud
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- Cisco UCS providing the converged computing, network, and storage platform
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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
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- Security, Isolation and Multi-tenancy



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

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





VersaStack for IBM Cloud Private with Cisco UCS and IBM Storage

TECHNICAL HIGHLIGHTS

- VersaStack with Cisco UCS M5 and IBM Storage for IBM Private Cloud.
- IBM Cloud Private 2.1.0 Enterprise Edition
- IBM Spectrum Connect 3.4.0
- IBM Storage Enabler for Containers 1.0
- VMware vSphere 6.5 U1

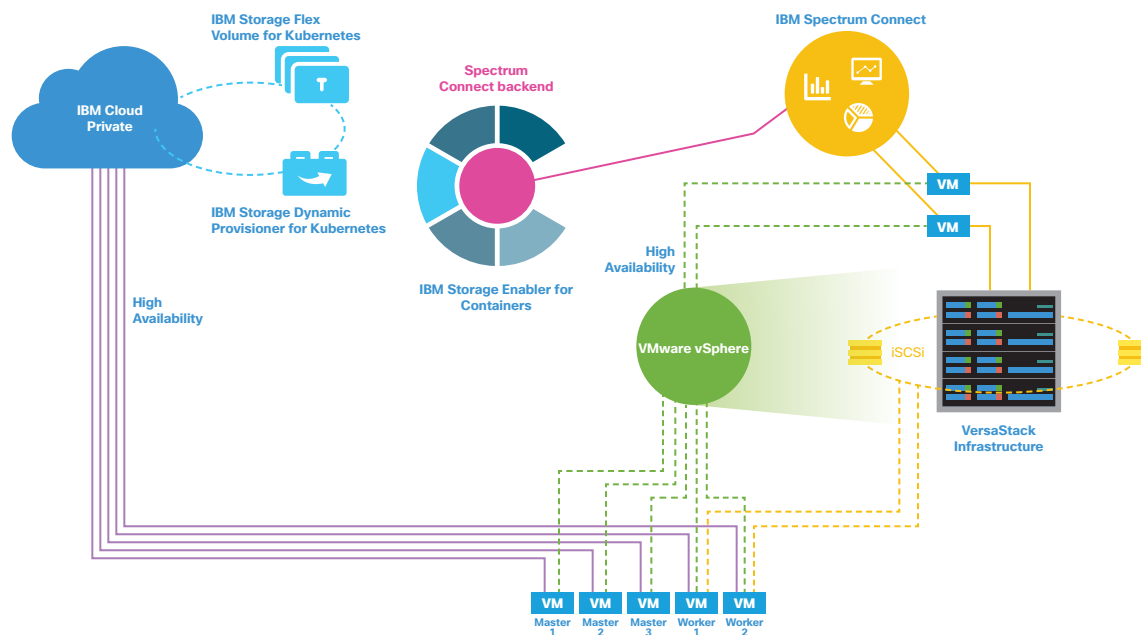
SUMMARY

- Enterprise grade highly available and secure Infrastructure with VersaStack
- Persistent storage for application containers
- Multi-tenant containers and orchestration that is based on Kubernetes for creating microservices-based applications
- A common catalog of enterprise and open services to accelerate developer productivity
- Automatic horizontal and non-disruptive vertical scaling of applications

BUSINESS CHALLENGES

- **Operational complexity:** Ability to deploy and run cloud native microservices-based applications on-premises.
- **Compliance and management:** Simplicity, ease of deployment and compliance requirements to keep applications and data secure with in enterprise's control.
- **Investment leverage:** Ability to leverage existing investments across both middleware and infrastructure.

ARCHITECTURE



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



TECHNICAL HIGHLIGHTS

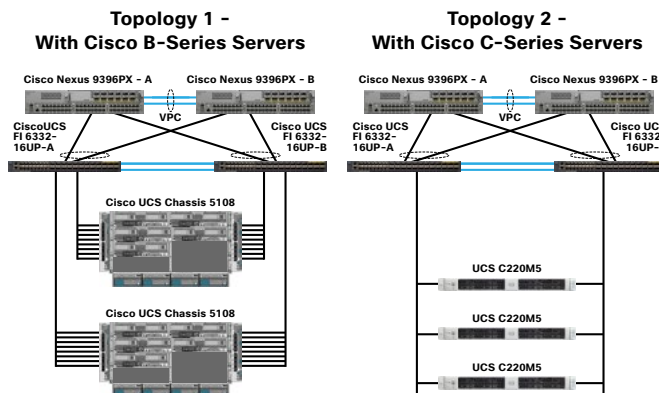
- CNM-based Contiv network plugin integrated with Docker Enterprise Edition
- Native fabric visibility with L2 VLAN forwarding mode
- Multi-tenancy and data path segregation for application container/microservices I/O with Contiv
- High performance with near line rate networking for application containers
- Infrastructure automation with UCS Manager built-in capabilities
- Docker EE with Contiv provisioning through Ansible for scale-out architecture



SUMMARY

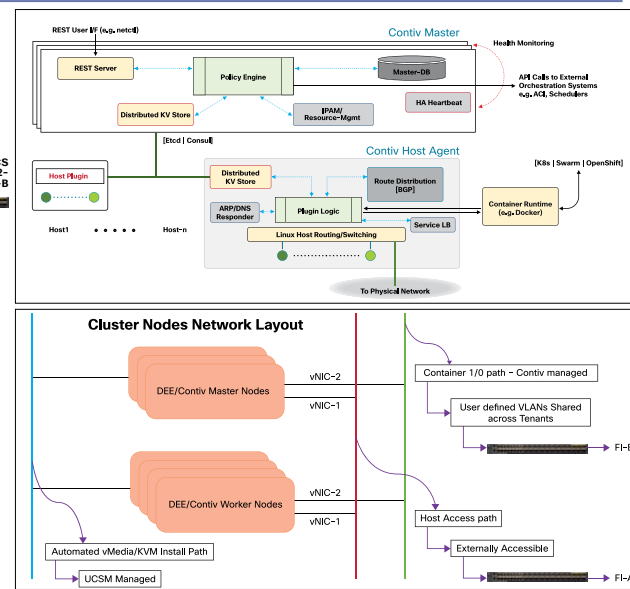
- Simple, efficient and scalable solution for any converged/integrated stack
- Cisco UCS infrastructure optimizes security, availability, performance and scale
- Docker Enterprise Edition provides a single management control plane from runtime to container lifecycle management
- Cisco UCS provides the 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



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





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

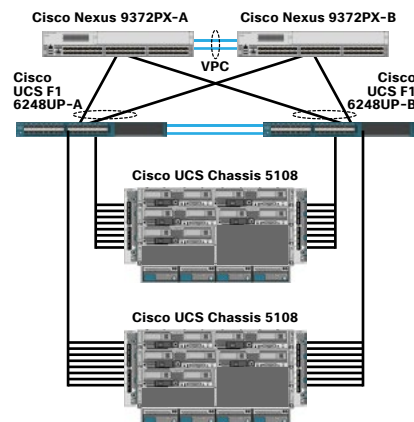
- Application portability across dev/ test and production deployment
- Agile business application deployment workflow and turnaround time
- Optimal infrastructural resource utilization
- Policy-based management
- Security and isolation

SUMMARY

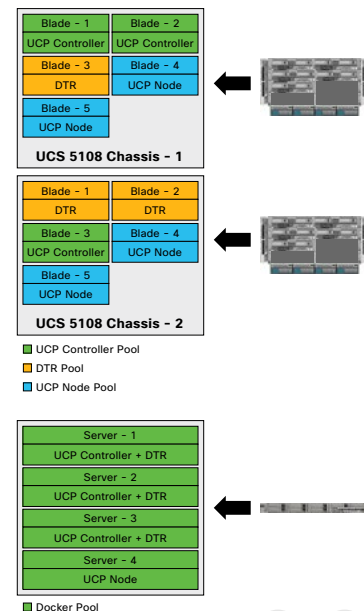
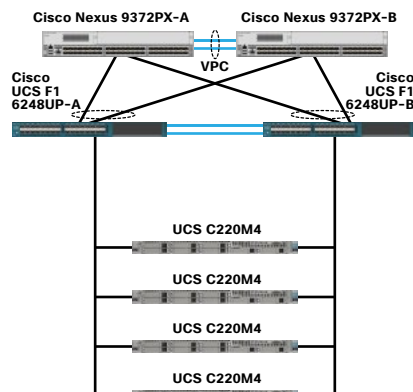
- Simple, efficient and scalable solution for any converged/integrated stack
- Cisco UCS infrastructure optimizes security, availability, performance and scale
- Docker Datacenter provides a single management control plane from runtime to container lifecycle management
- Cisco UCS provides the converged computing, network, and storage platform needed to run the entire Docker Datacenter
- Open APIs driven infrastructure provisioning through automation

ARCHITECTURE

Topology 1 - With Cisco B-Series Servers



Topology 2 - With Cisco C-Series Servers





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

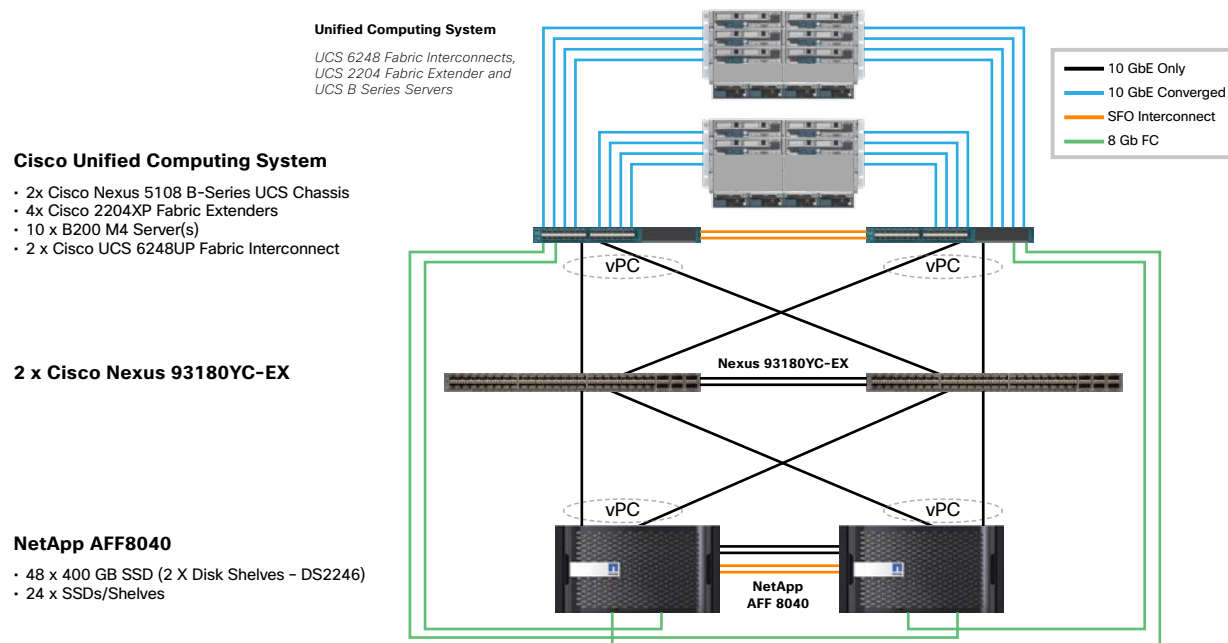
BUSINESS CHALLENGES

- 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





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/vccd designs

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 5.0 | May 2019

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>

The background is a complex, layered composition of glowing orange and yellow geometric shapes, primarily hexagons and rectangles, some of which are tilted. These shapes are interconnected by thin, white lines that resemble circuit traces or data paths. Small, bright white dots are scattered throughout, suggesting light sources or data points. The overall effect is a sense of depth and technological sophistication, with a color palette dominated by warm, monochromatic tones.

Thank you.