



Backup Solution Testing on UCS B and C Series Servers for Small-Medium Range Customers (Disk to Tape) – Acronis Backup Advanced Suite 11.5

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Backup Solution Testing

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Overview

This program (Backup Testing - Backup to Disk and Replicate to Tape) validates data backup from the Windows and Linux operating systems on the Cisco UCS environment and the backup data stored in the Local HDD and replicated to HP Store Ever LTO-5 Ultrium 3280, HP Store Ever LTO-6 Ultrium 6650, HP Store Ever LTO-6 Ultrium 6250 SAS External Tape Drives. The objective of Backup Testing is to verify the Backup and Restore of Data, entire Disks of Windows Server 2012 R2/ Linux RHEL 7.0/ SLES 12, Full Virtual machines, MS SQL, P2V, V2P by the backup software (Acronis Backup Advanced Suite) with the data repository models, which are covered in the features Tested section.

Acronyms

Acronym	Description
10GbE	10 Gigabit Ethernet
ABAS	Acronis Backup Advanced Suite
AES	Advanced Encryption Standards
AMS	Acronis Management Server
ASN	Acronis Storage Node
CNA	Converged Network Adapter
HDD	Hard Disk Drive
JOS	Japanese Operating System
LVM	Logical Volume Manager
MS	Microsoft
OS	Operating System

Acronym	Description
P2V	Physical To Virtual
PCI	Peripheral Component Interface
PCIe	Peripheral Component Interface Express
RAID	Redundant Array of Independent Disks
RHEL	Red Hat Enterprise Linux
SLES	SUSE Linux Enterprise Server
SQL	Structured Query Language
UCS	Unified Computing System
UCSM	Unified Computing System Manager
V2P	Virtual To Physical
VIC	Virtual Interface Card
VM	Virtual Machine

Backup Testing Strategy

The requirements gathered for Backup Testing (Backup to Disk and Replicate to Tape) are specific to the Japanese usage and market.

The following requirements are derived based on the inputs and prioritization given by Cisco Japan Solution Engineers:

- Virtual Machines are available on ESXi 5.5, which is installed in the Cisco UCS B Series Servers(B200 M4)
- Japanese SUSE Linux Enterprise Server 12 installed directly on the Cisco UCS B Series Server(B200 M4) for Disaster Recovery
- Japanese RHEL 7.0(x64) installed directly on the Cisco UCS B Series Server(B200 M4) for Disaster Recovery
- Japanese Windows server 2012 R2 (x64) installed directly on the Cisco UCS B Series Server(B200 M4) for Disaster Recovery
- Acronis Backup Advanced Suite 11.5 is used as Backup software.
- Acronis Backup Advanced Suite 11.5 installed on top of the Windows Server 2012 R2 Japanese Operating System, which is installed on the local HDD of C Series Server. The Server also acts as AMS (Acronis Management Server)
- Backup server is connected to HP Store Ever LTO-5 Ultrium 3280, HP Store Ever LTO-6 Ultrium 6650, HP Store Ever LTO-6 Ultrium 6250 SAS External Tape Drive by SAS connectivity using External LSI SAS 9300 -8E Card.

- The internal RAID controller used on Cisco UCS C Series Server is Cisco 12G SAS Modular RAID Controller.
- Backup data is stored in C Series Server Local HDD and then Replicated to HP Store Ever LTO-5 Ultrium 3280, HP Store Ever LTO-6 Ultrium 6650, HP Store Ever LTO-6 Ultrium 6250 SAS External Tape Drives using Acronis Backup Advanced Suite 11.5.
- Backup the Full Virtual Machines from the ESXi 5.5 Server which is installed on UCS B Series server (B200 M4). Virtual Machines are installed with Windows 8.1, RHEL 7.0, SLES 12.
- Data backup from the Windows 8.1 and RHEL 7.0 Japanese Operating Systems that are installed as Virtual machines. Data files include Microsoft Excel, Microsoft Word and PDF of size 500 MB.
- Database backup from MS SQL Server 2012 SP2 on the Windows Server 2012 R2 Japanese Operating System that is installed as a Virtual Machine.
- Select files from Windows or Linux operating system and schedule a backup job from AMS (Acronis Management Server).
- Backup job is done from Windows/Linux Operating systems to Local HDD (1st location) and replicate it to HP Store Ever LTO-5 Ultrium 3280, HP Store Ever LTO-6 Ultrium 6650 , HP Store Ever LTO-6 Ultrium 6250 SAS External Tape Drives (2nd Location).



CHAPTER 2

Test Topology and Environment Matrix

- [Test Topology, page 6](#)
- [Environment Matrix, page 11](#)

Test Topology

Figure 1: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

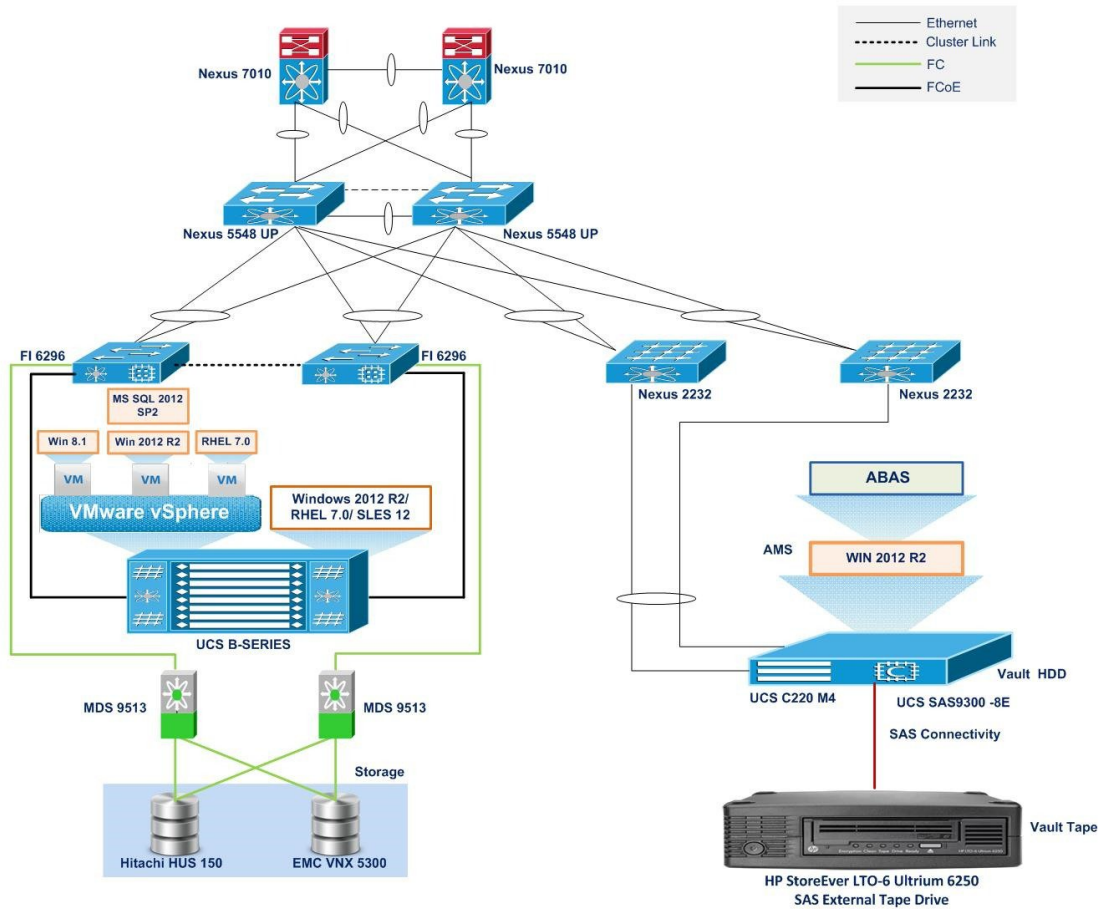


Figure 3: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

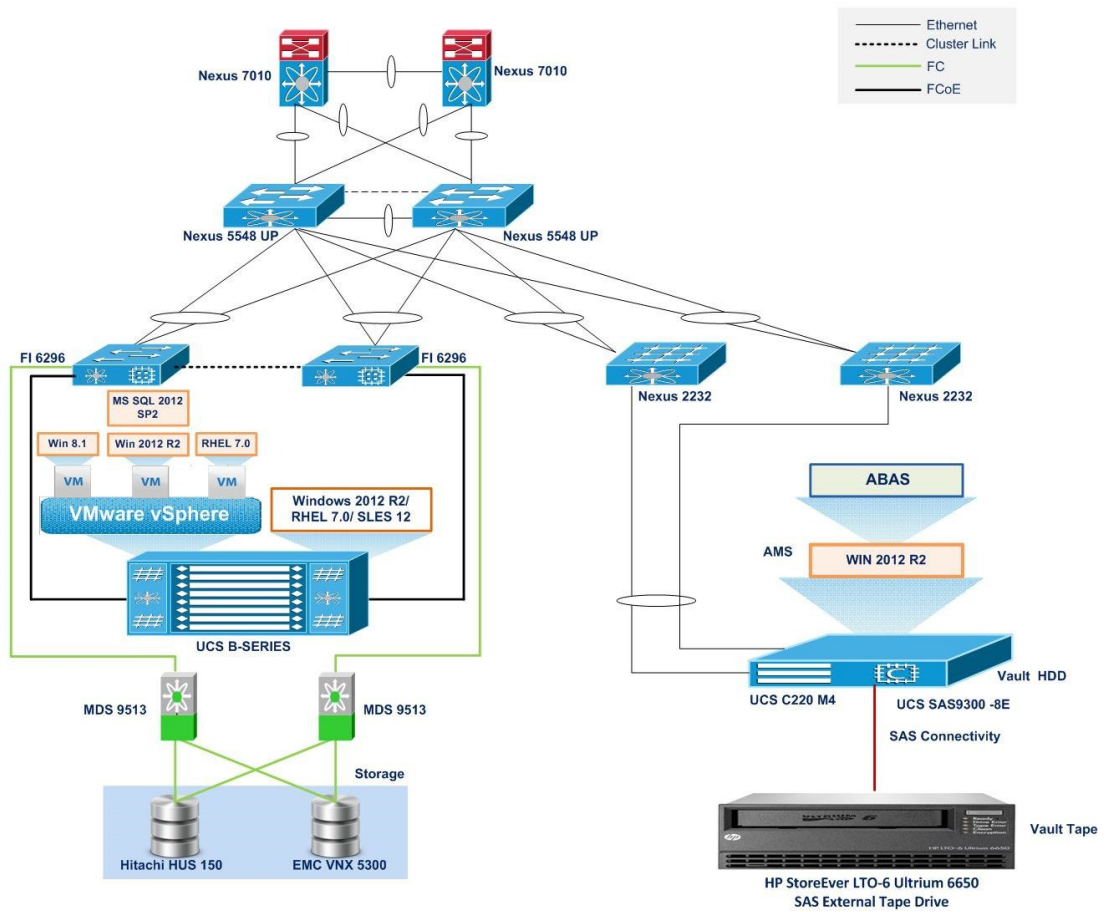


Figure 4: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

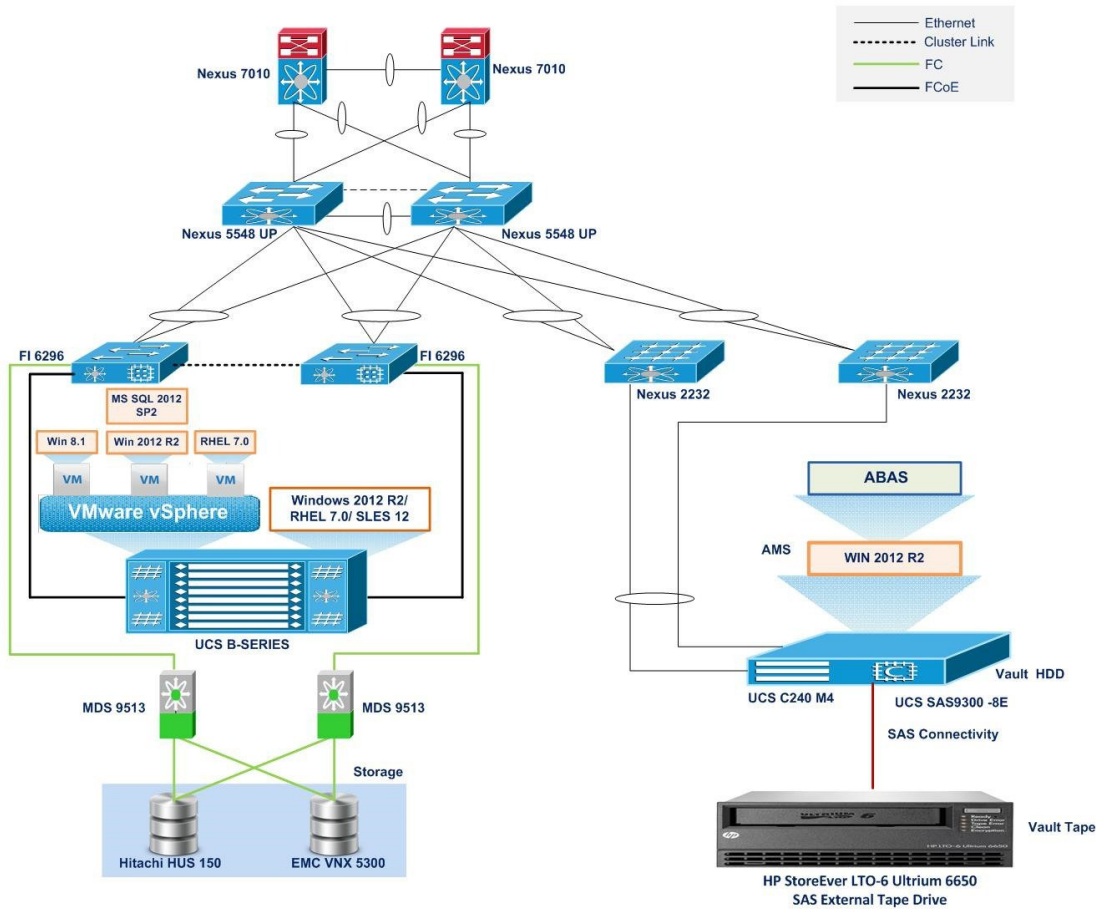


Figure 5: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

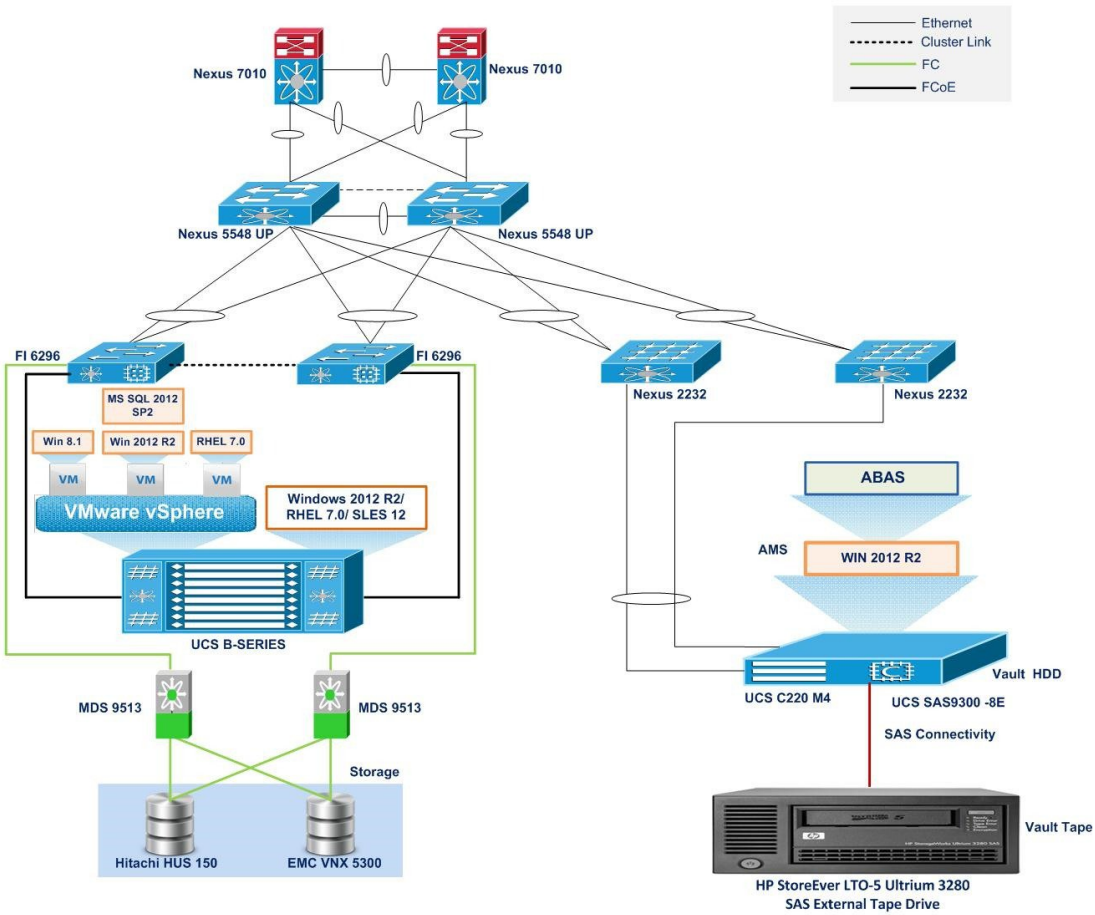
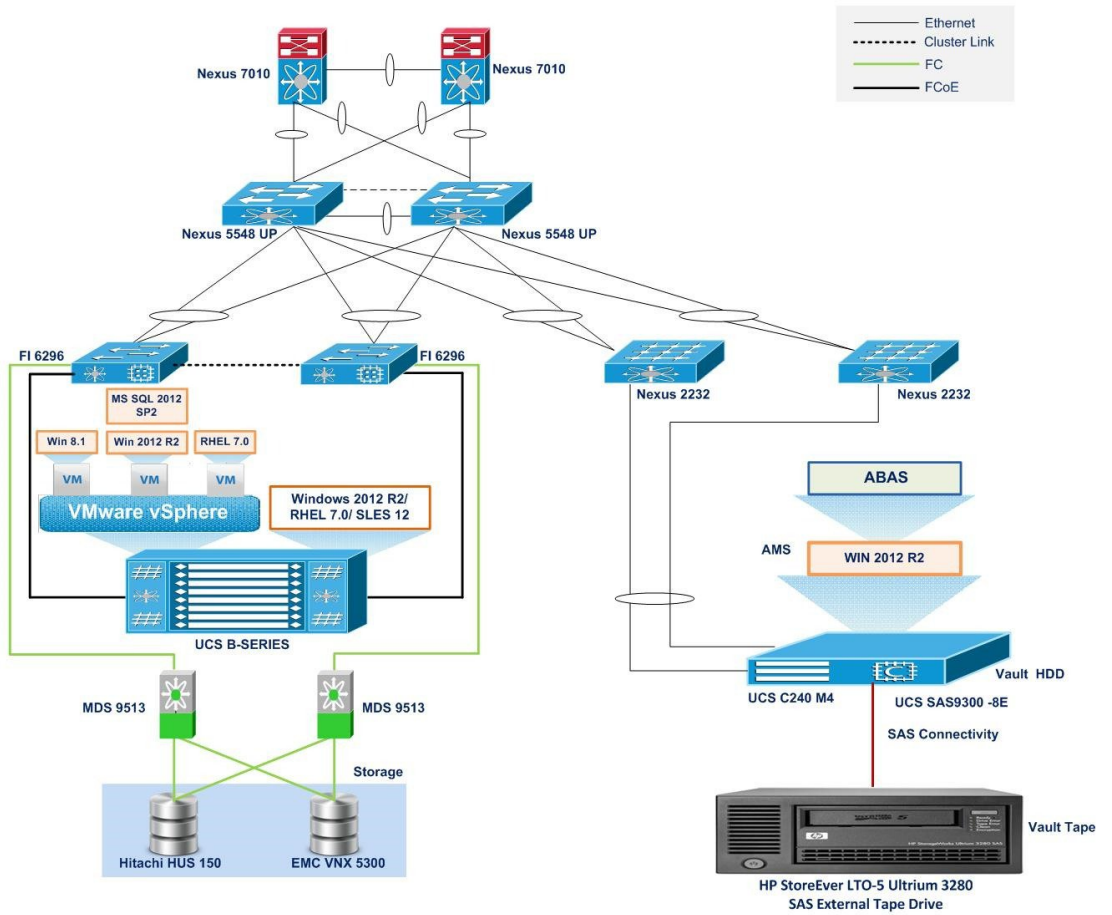


Figure 6: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Environment Matrix

Component	Version
UCS	
Blade servers	Cisco UCS B200 M4
Rack Server	Cisco UCS C220 M4, C240 M4
UCSM	2.2(3d)
CIMC	2.0(3i)
Infra	
Nexus 7010	6.2(2)
Nexus 5548UP	5.2(1)N1(6)

Component	Version
Fabric Extender 2232	NA
Backup Software	
Acronis Backup Advanced Suite	11.5 Build No - 43719
Operating Systems	
Windows OS	Windows 8.1 Enterprise 64 (Japanese)
Windows Server OS	Windows Server 2012 R2 x64 (Japanese)
RHEL	Redhat Enterprise Linux 7 x64 (Japanese)
SLES	SUSE Linux Enterprise Server 12 (Japanese)
Data Base	
MS SQL server	Microsoft SQL Server 2012 SP2 Enterprise x64(Japanese)
Hypervisor	
ESXi	VMware ESXi 5.5 1331820
Tape Library	
HP StoreEver LTO-5 Ultrium 3280	NA
HP StoreEver LTO-6 Ultrium 6650	NA
HP StoreEver LTO-6 Ultrium 6250	NA
PCI Adapters	
Cisco UCS VIC 1227	4.0(1e)
Cisco UCS VIC 1380	4.0(1D)
UCS SAS9300 -8E	05.00.00.00
Cisco 12G SAS Modular RAID Controller	24.5.0-0020



Implementation and Features Tested

- [Design and Implementation, page 13](#)
- [Features Tested, page 14](#)

Design and Implementation

This program verifies and validates the functionality of Acronis Backup Advanced Suite 11.5 features on Cisco UCS Servers for Japanese environment.

Backup Server components (Server and Client) are installed on JOS and backup scheduled from Cisco UCS B Series Server to the Local HDD of C Series Server and replicate to Tape Library.

The following activities were involved in the Implementation phase:

- Installed VMware ESXi 5.5 on the UCS B Series Servers(B200 M4) that are configured to boot from Local HDD.
- Installed the Windows Server 2012 R2 Japanese operating system in the C Series Server on a Local HDD that is configured with RAID 5 (single parity). This C Series Server acts as a Backup Server and AMS (Acronis Management Server), which is the Centralized Management console for taking the Backup and Restore of machines.
- On the B Series Server installed with ESXi 5.5, three virtual machines were created and installed with the following Japanese Operating Systems respectively:
 - Windows 8.1 Enterprise x64
 - Windows Server 2012 R2 x64
 - Red Hat Enterprise Linux 7.0 x64
 - SUSE Linux Enterprise Server 12
- Cisco UCS C Series server is connected with Nexus 5548 UP Switch using the Fabric Extender 2232.
- LSI SAS 9300 -8E Card is used for SAS Connectivity between Backup Servers and HP StoreEver LTO-5 Ultrium 3280, HP StoreEver LTO-6 Ultrium 6650, HP StoreEver LTO-6 Ultrium 6250.
- C Series Server installed with Windows Server 2012 R2 x64 Japanese Operating System and Acronis Backup Advanced Suite 11.5.

- Acronis Backup Advanced Suite 11.5 Agent for Core, Agent for Windows, Agent for Management Console are Installed on the Windows 8.1 Virtual Machines.
- Acronis Backup Advanced Suite 11.5 Agent is also installed on RHEL 7.0 Virtual Machines by installing the Required Packages (such as kernel, kernel-devel and GCC).
- Acronis Backup Advanced Suite 11.5 Agent for SQL is also installed on top of Windows Server 2012 R2 machine and by adding required privilege to the Acronis Agent.
- Acronis Backup Advanced Suite 11.5 Agent for VMware vSphere ESXi enables backup and recovery of ESXi virtual machines without installing agents into the guest systems. The Agent for VMware vSphere ESXi (Virtual Appliance) is deployed directly to the VMware ESXi host.
- Windows Server 2012 R2, Linux Operating System RHEL 7.0 and SLES 12 are installed on the UCS B Series Blades (UCS B200 M4) for Bare Metal Disaster Recovery using Acronis Backup Advanced Suite 11.5.

Features Tested

Data Backup was tested with the following backup methods:

Full Backup

Full backup is the starting point for all other types of backup and contains all the data in the folders and files that are selected to be backed up. Because full backup stores all files and folders, frequent full backups resulting faster and simpler restore operations.

Differential Backup

Differential backup contains all files that have changed since the last FULL backup. The advantage of a Differential backup is that it shortens restore time compared to a full backup or an incremental backup. However, if you perform the differential backup too many times, the size of the differential backup might grow to be larger than the baseline full backup.

Incremental Backup

Incremental backup stores all files that have changed since the last FULL, DIFFERENTIAL, or INCREMENTAL Backup. The advantage of an incremental backup is that it takes the least time to complete. However, during a restore operation, each incremental backup must be processed, which could result in a lengthy restore job.

Archive protection

This option defines whether the archive will be protected with a password and whether the archive's content will be encrypted. This option is effective for both Windows and Linux Operating System

Do not encrypt - the archive will be protected with the password only

AES 128 - the archive will be encrypted using the Advanced Encryption Standard (AES) algorithm with a 128-bit key

AES 192 - the archive will be encrypted using the AES algorithm with a 192-bit key

AES 256 - the archive will be encrypted using the AES algorithm with a 256-bit key

The larger the key size, the longer it will take for the program to encrypt the archive and the more secure data will be. The encryption key is then encrypted with AES-256 using a SHA-256 hash of the password as a key. The password itself is not stored anywhere on the disk or in the backup file; the password hash is used for

verification purposes. With this two-level security, the backup data is protected from any unauthorized access, but recovering a lost password is not possible.

Backup priority

The Following Priority are mentioned while creating the Backup Plan

- **Low** - to minimize resources taken by the backup process, leaving more resources to other processes running on the machine
- **Normal** - to run the backup process with normal speed, allocating resources on a par with other processes
- **High** - to maximize the backup process speed by taking resources from other processes.

Compression level

The option defines the level of compression applied to the data being backed up. This applies to both Windows & Linux Operating System. The optimal data compression level depends on the type of data being backed up.

- **None** - the data will be copied as is, without any compression. The resulting backup size will be maximal.
- **Normal** - recommended in most cases.
- **High** - the resulting backup size will typically be less than for the **Normal** level.
- **Maximum** - the data will be compressed as much as possible. The backup duration will be maximal. You may want to select maximum compression when backing up to removable media to reduce the number of blank disks required

Volume Shadow Copy Service

These options are effective only for Windows operating systems.

The option defines whether a Volume Shadow Copy Service (VSS) provider has to notify VSS-aware applications that the backup is about to start. This ensures the consistent state of all data used by the applications; in particular, completion of all database transactions at the moment of taking the data snapshot by Acronis Backup & Recovery 11.5.

Bootable media

Bootable media is physical media (CD, DVD, USB flash drive or other removable media supported by a machine BIOS as a boot device) that boots on any PC-compatible machine and enables you to run Acronis Backup & Recovery 11.5 Agent either in a Linux-based environment or Windows Pre-installation Environment (WinPE), without the help of an operating system. Bootable media is most often used to:

- recover an operating system that cannot start
- access and back up the data that has survived in a corrupted system
- deploy an operating system on bare metal
- create basic or dynamic volumes on bare metal
- back up sector-by-sector a disk with an unsupported file system
- backup offline any data that cannot be backed up online because of restricted access, being permanently locked by the running applications or for any other reason.

Microsoft SQL Server with single-pass backup

A single-pass backup operation creates an application-aware disk backup which enables browsing and recovery of the backed-up application data without recovering the entire disk or volume. The disk or volume can also be recovered as a whole. This means that a single solution and a single backup plan can be used for both the disaster recovery and data protection purposes. The application logs can be truncated after the backup, if necessary.

The single-pass backup functionality becomes available by installing Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass).

Virtual Appliance for ESXi Host

Acronis believes that virtualization and transition to the cloud are not only a better way of doing computing, but also allow for achieving less downtimes and faster recoveries while reducing costs.

Acronis is firmly committed to helping its customers and channel partners get most of virtualization, and intend to set a new standard of backup and recovery in virtualized environments through:

- Reducing IT operating and maintenance costs to help business performance by providing technology that is easy to use and easy to implement.
- Minimizing overhead and getting most benefits from VMware vSphere environments by providing a backup and recovery solution specially designed for virtualized environments.
- Minimize risk of data loss by storing backup offsite in Acronis Cloud Storage.

Acronis Backup for VMware software could be installed directly on an ESX(i) host. Specify the desired ESX(i) server or vCenter access credentials. Set your Appliance (VM) name, choose the ESX(i) host and datastore as a target for deploying the Acronis Backup for VMware software.

De-Duplication

Deduplication is the process of minimizing storage space taken by the data by detecting data repetition and storing the identical data only once.

Deduplication may also reduce network load: if, during a backup, a data is found to be a duplicate of an already stored one, its content is not transferred over the network.

Acronis Backup & Recovery 11.5 will deduplicate backups saved to a managed vault if you enable deduplication during the vault creation. A vault where deduplication is enabled is called a deduplicating vault. The Deduplication add-on to the agent must be installed on any machine that backs up to such vault. Without the add-on backing up to the vault is not possible.

P2V

Migration of a disk image, created with the program (.tib image file), to a virtual disk file of the type you select (.vmdk, .vhd, .hdd). You will then be able to add the disk to a virtual machine of compatible type (VMware, MS Hyper-V or Virtual Server, Citrix XenServer, Parallels virtual machine).

V2P

Migration of an operating system (OS), application programs and data from a VMware virtual machine into a physical machine, even if it has dissimilar x86 hardware and drivers to the original machine. It supports both 32-bit and 64-bit x86 hardware, VMware virtualization software which makes it a very complete and universal proposal.

LVM

This option is effective only for Linux operating systems when you back up volumes managed by Linux Logical Volume Manager (LVM). Such volumes are also called logical volumes. Acronis Backup & Recovery 11 will use Linux Logical Volume Manager to take the snapshot and to work with it during backup. This way, backing up the volume may be less efficient than when using Acronis's mechanism.



Test Scenarios for UCS with Acronis Backup Advanced Suite 11.5

- [Baremetal Disaster Recovery, page 18](#)
- [VM Backup, page 20](#)
- [Windows File / Folders Backup , page 26](#)
- [Linux File / Folders Backup , page 32](#)
- [SQL Backup, page 38](#)
- [P2V, page 44](#)
- [V2P, page 50](#)
- [Issues, page 51](#)
- [Related Documentation, page 52](#)

Baremetal Disaster Recovery

Figure 7: Topology with Network Shared Location over UCS C220 M4 Server

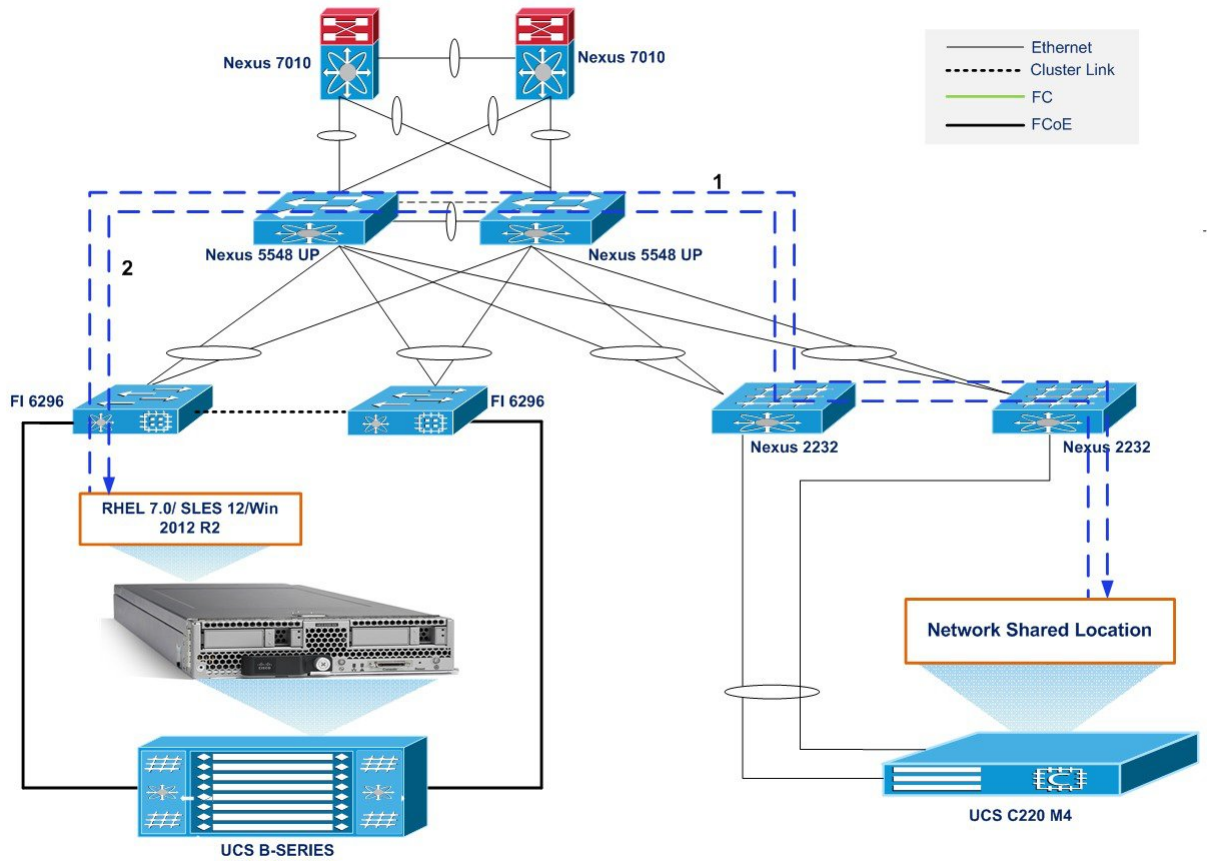
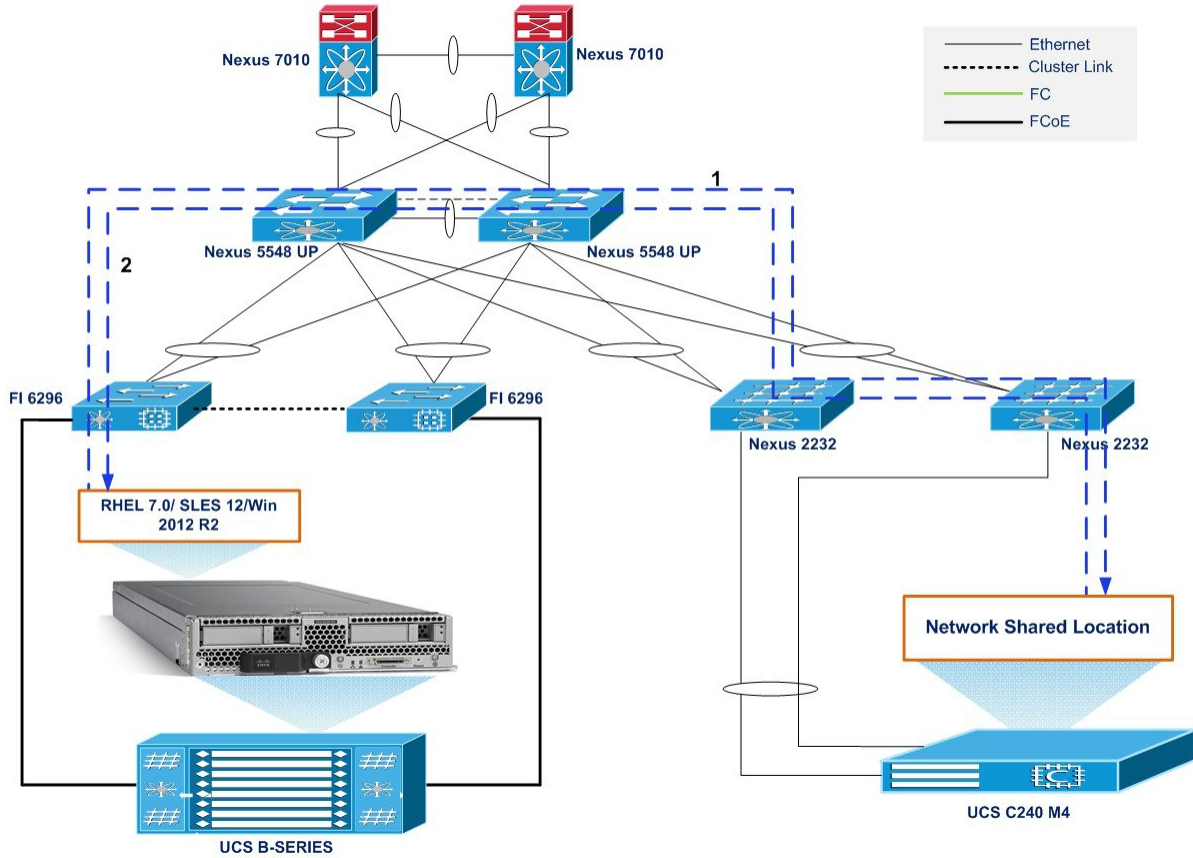


Figure 8: Topology with Network Shared Location over UCS C240 M4 Server



Backup Data Flows:

Step	From	To
1	Backup of B Series Server(Entire Disks)	Network Share
2	Network Share	B Series Server

Description

- Backup of Entire Disks from Japanese SLES 12, RHEL 7.0 and Windows server 2012 R2 Operating System to Network Share Location
- Restore the Entire Disks from Network Share location to the Similar hardware from Acronis Backup Advanced Suite 11.5 Recover Option

VM Backup

Fig 9: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

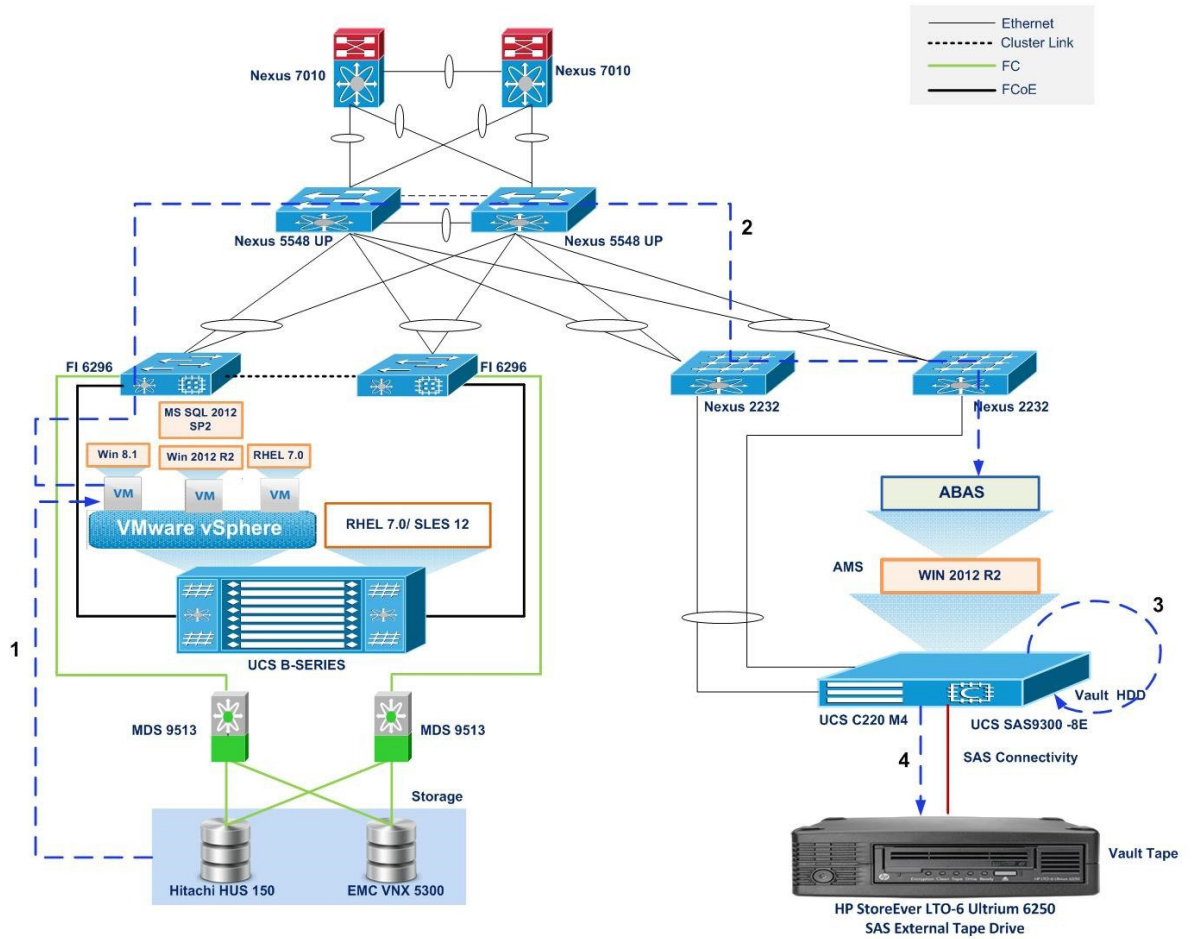
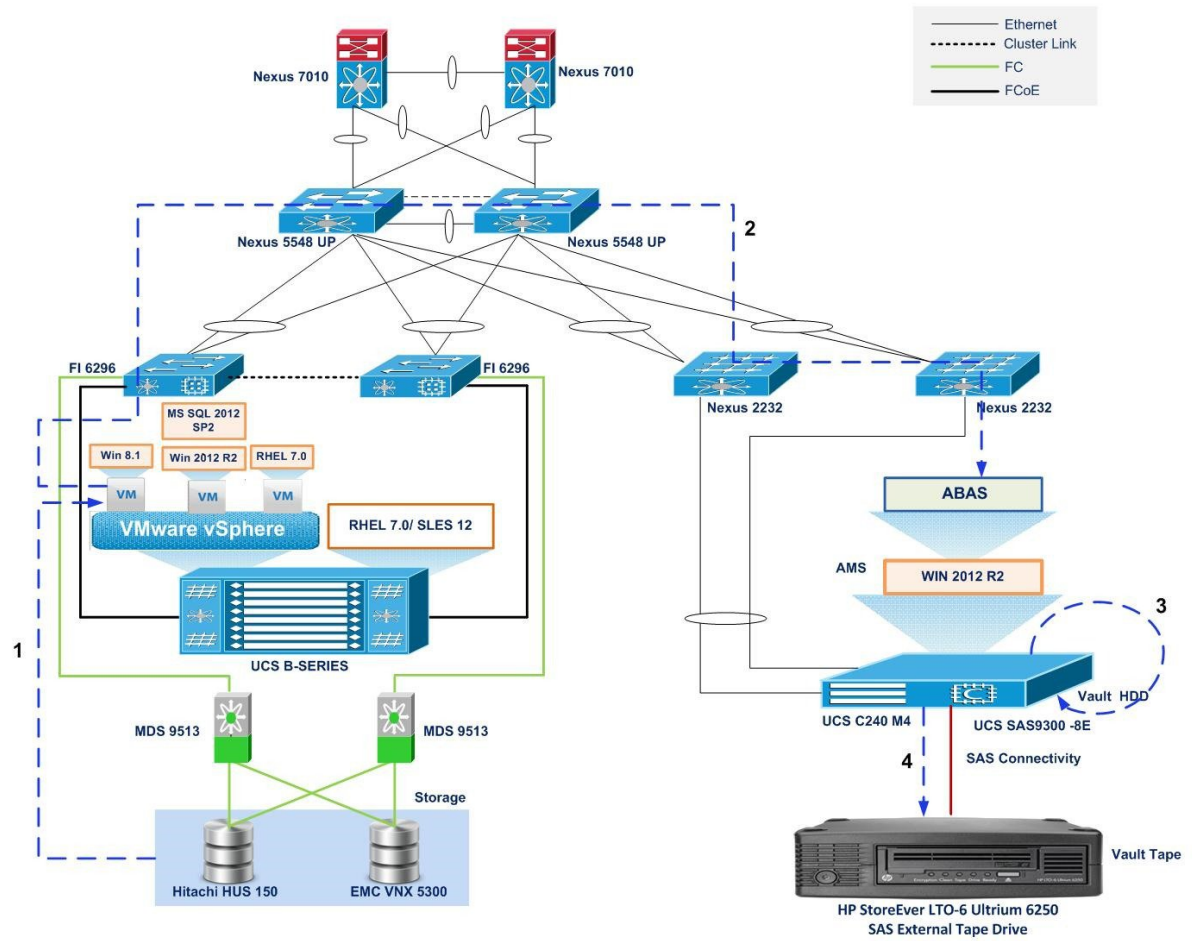


Fig 10: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HPStoreEverLTO-6 Ultrium 6250

Fig 11: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

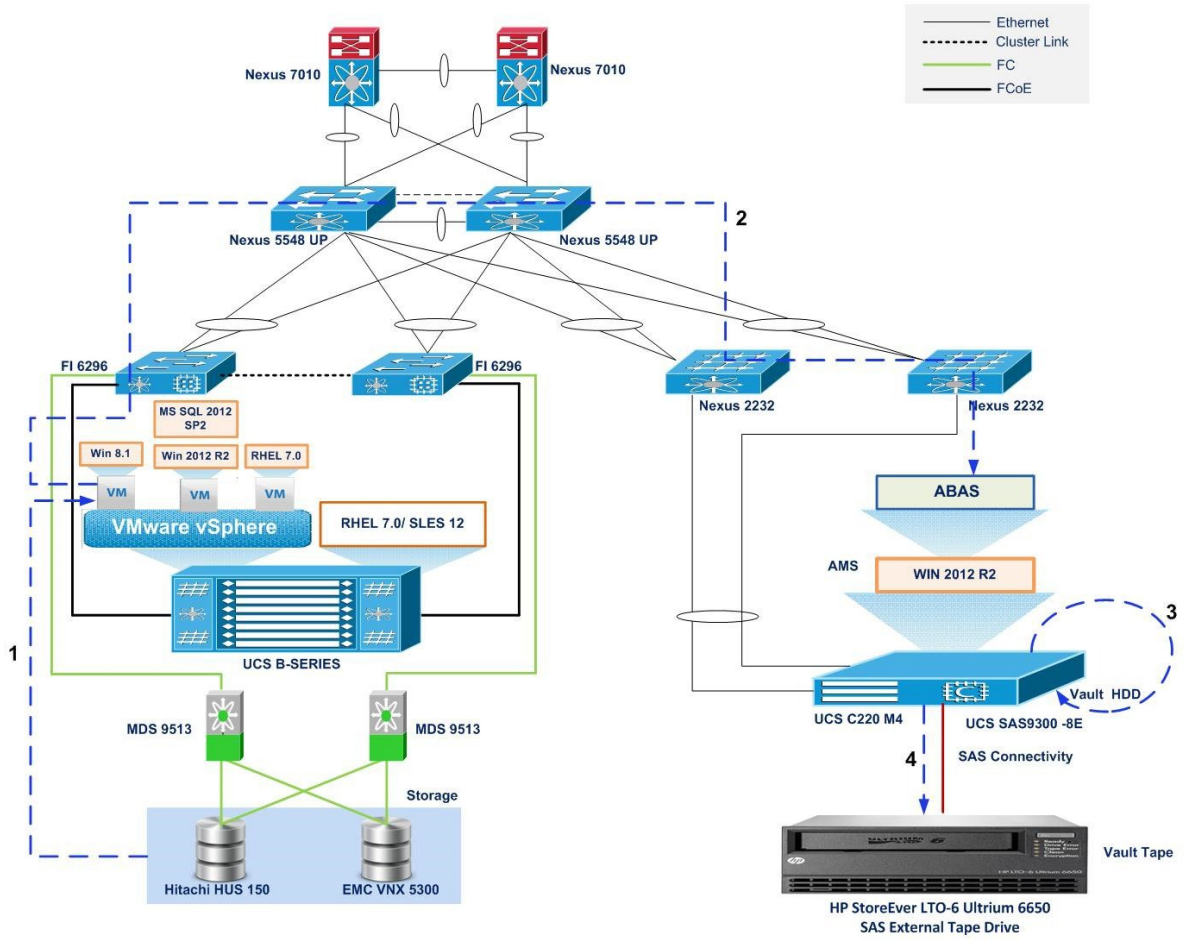
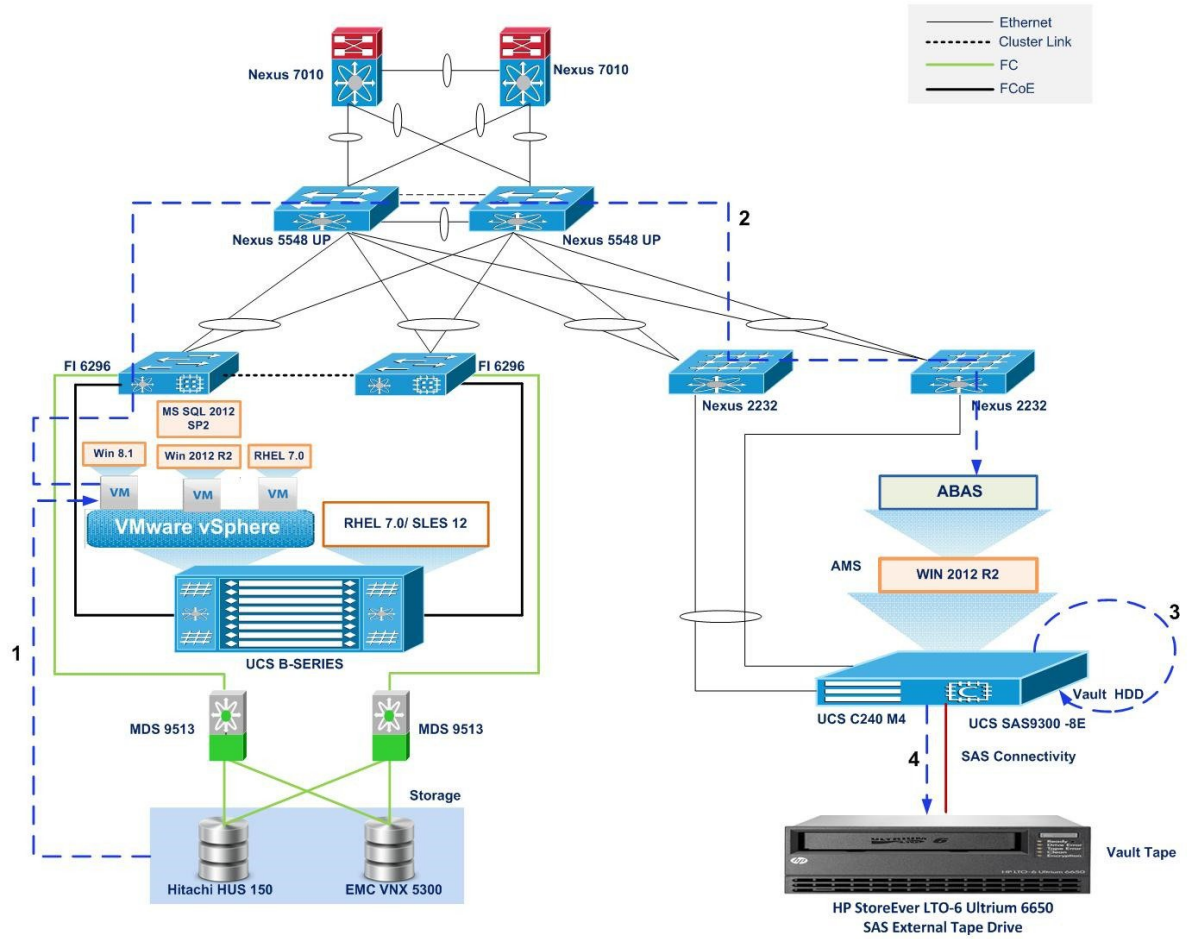


Fig 12: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HPStoreEverLTO-6 Ultrium 6650

Fig 13: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

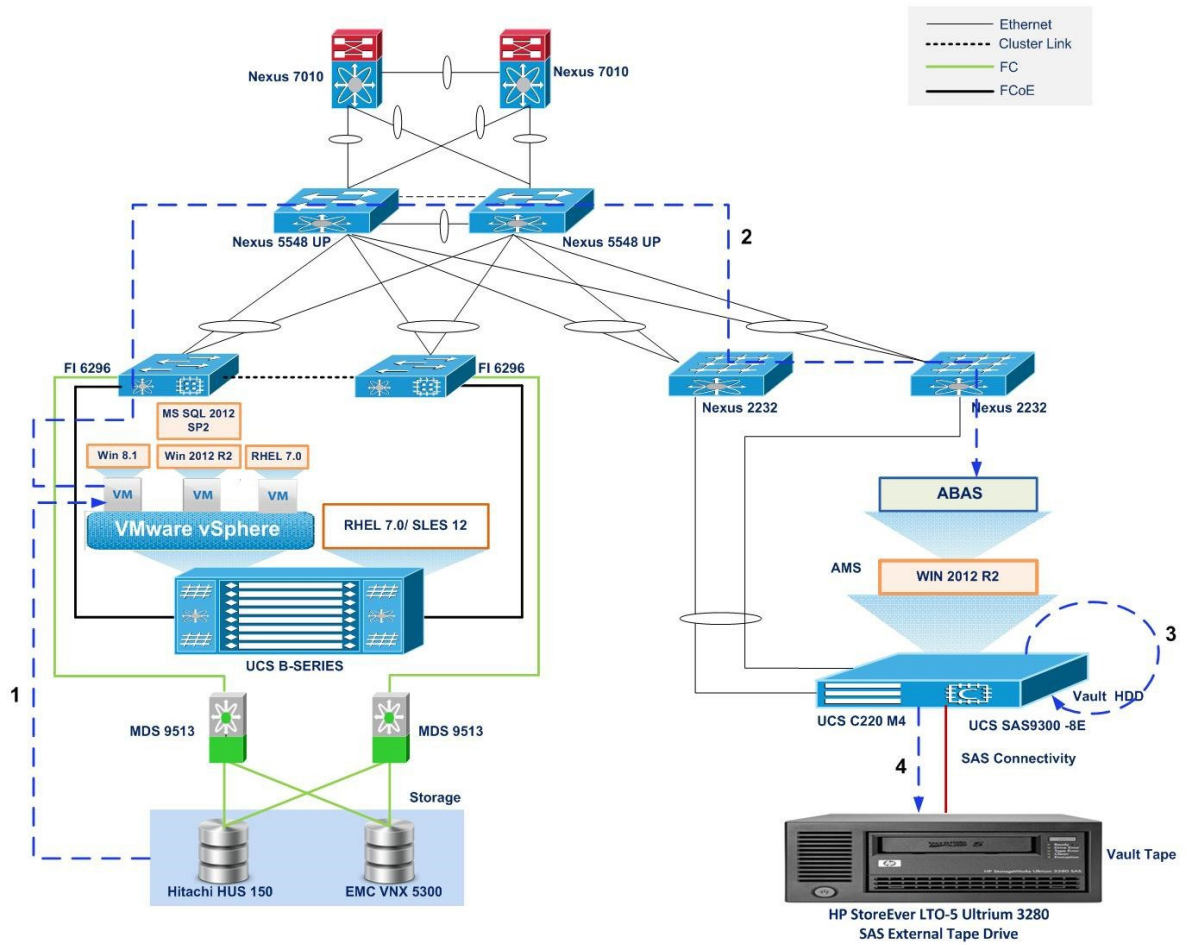
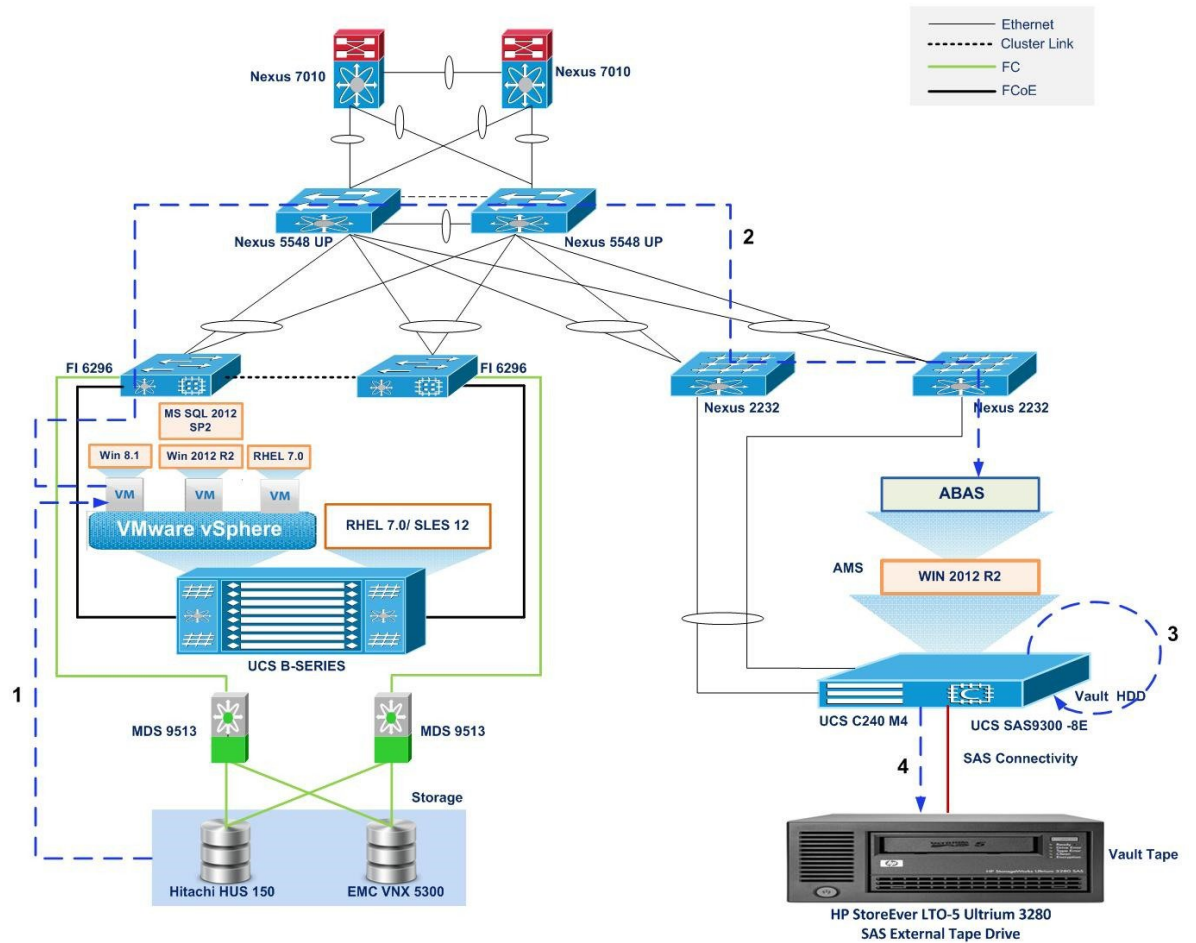


Fig 14: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HPStoreEverLTO-5 Ultrium 3280

Description

- Select the Virtual Machine to be backed up using Acronis Backup Advanced Suite 11.5.
- Run the Backup Job and Backup of Virtual Machine is Successful.

- Select the Archive and create Recovery Plan.
- Specify where to recover as "New Virtual Machine "in Recovery Plan.
- Run the Recovery Job and the Restore of Virtual Machine is successful.
- Restored Virtual Machine possesses different VM Version.

Windows File / Folders Backup

Figure 15: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

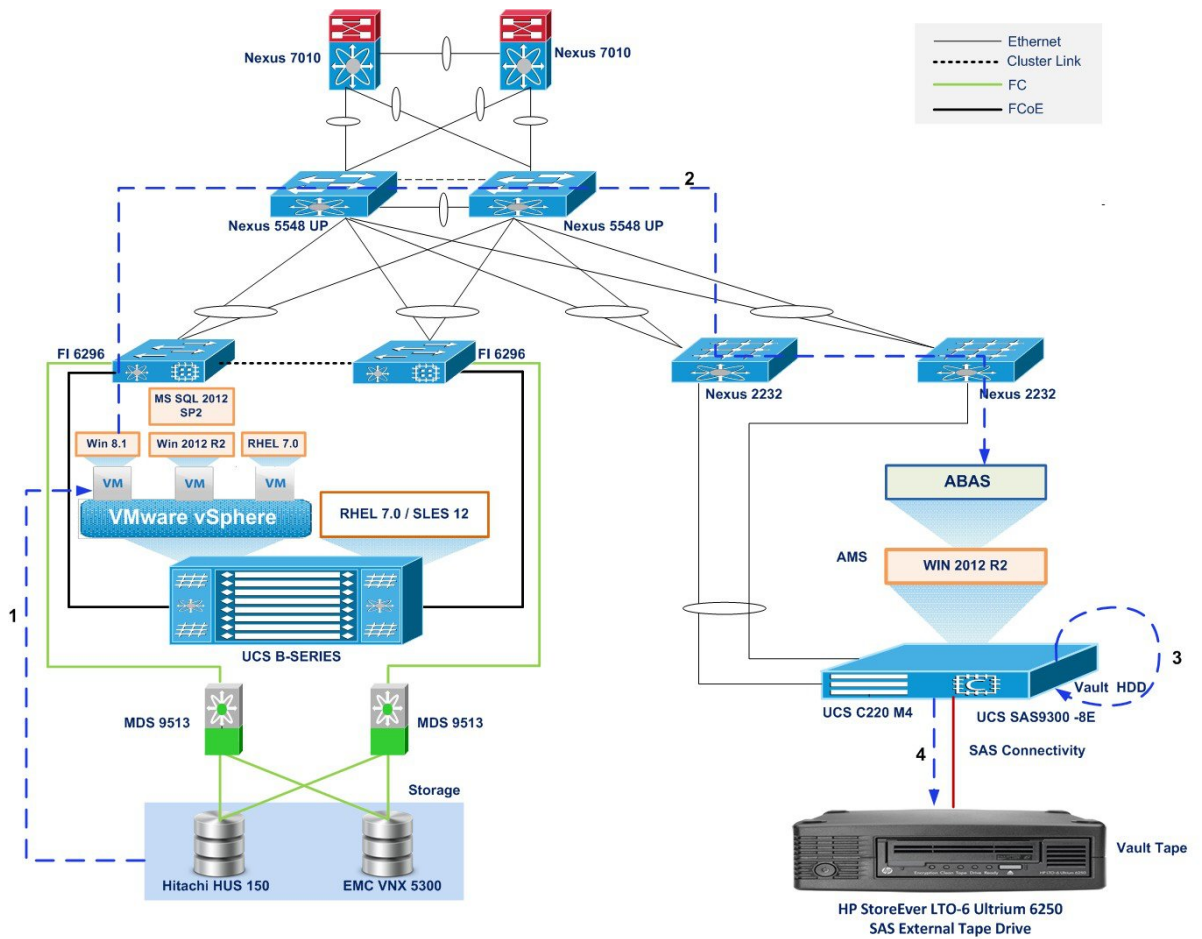
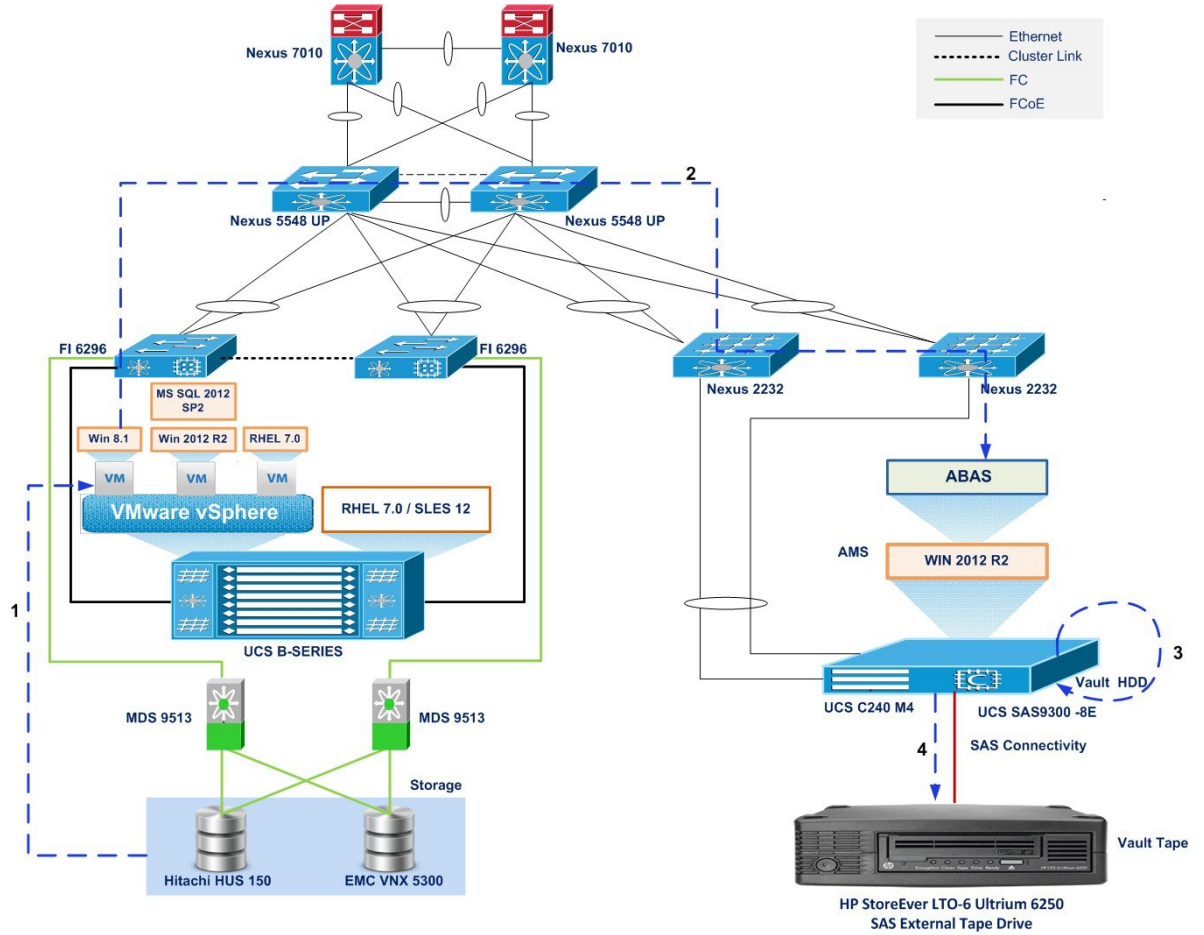


Figure 16: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6250

Description

- Backup of data files (Word, PDF, and Excel) from Windows 8.1 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-6 Ultrium 6250 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-6 Ultrium 6250 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

Figure 17: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

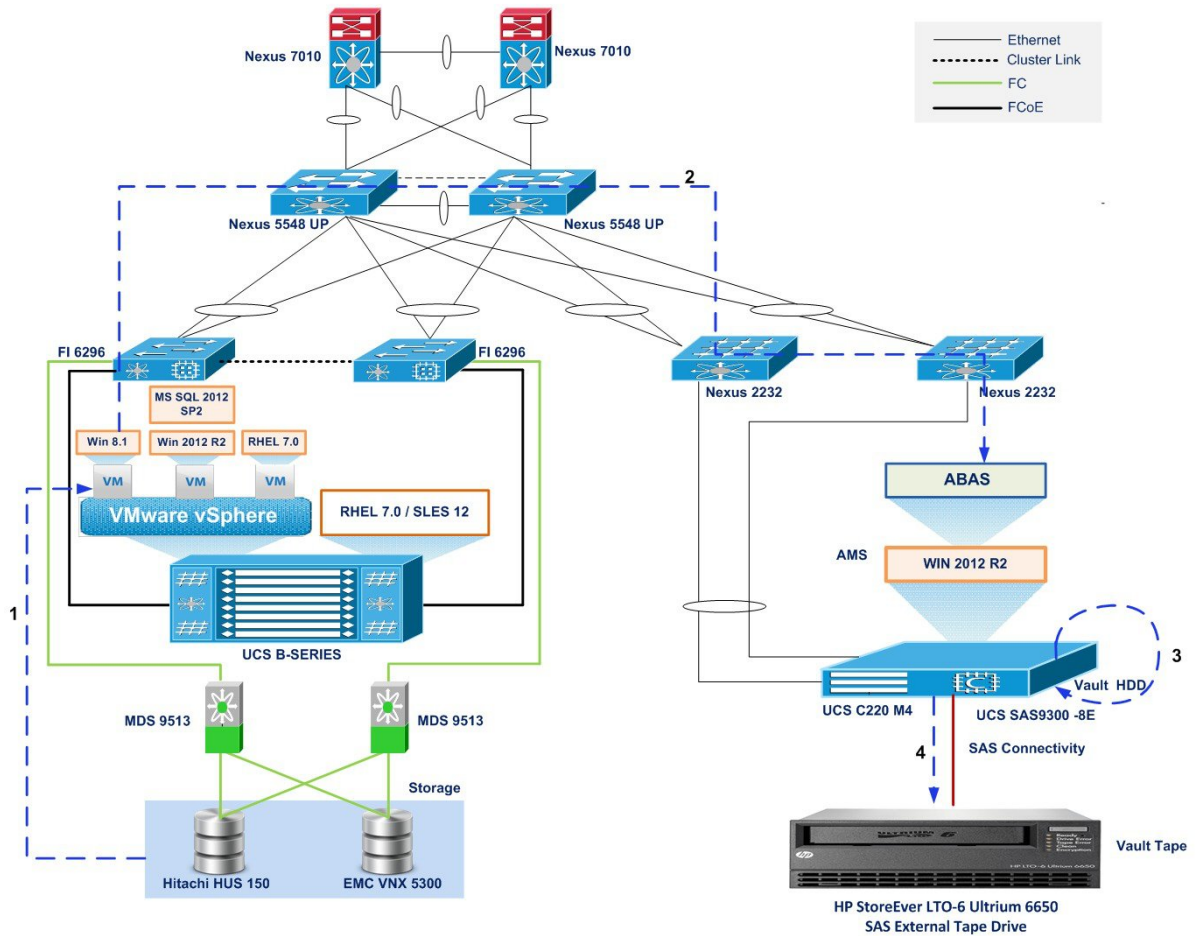
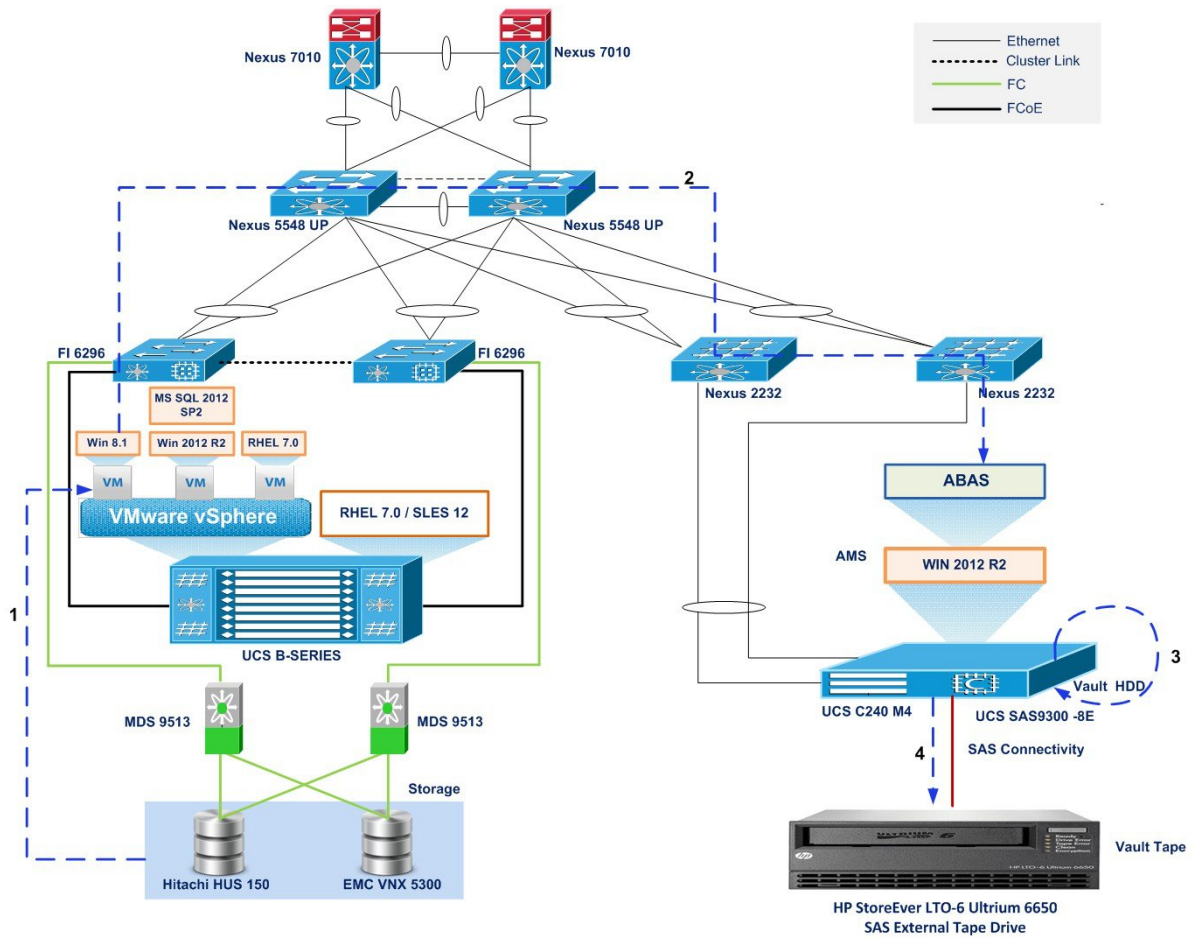


Figure 18: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6260 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6650

Description

- Backup of data files (Word, PDF, and Excel) from Windows 8.1 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-6 Ultrium 6650 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-6 Ultrium 6650 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

Figure 19: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

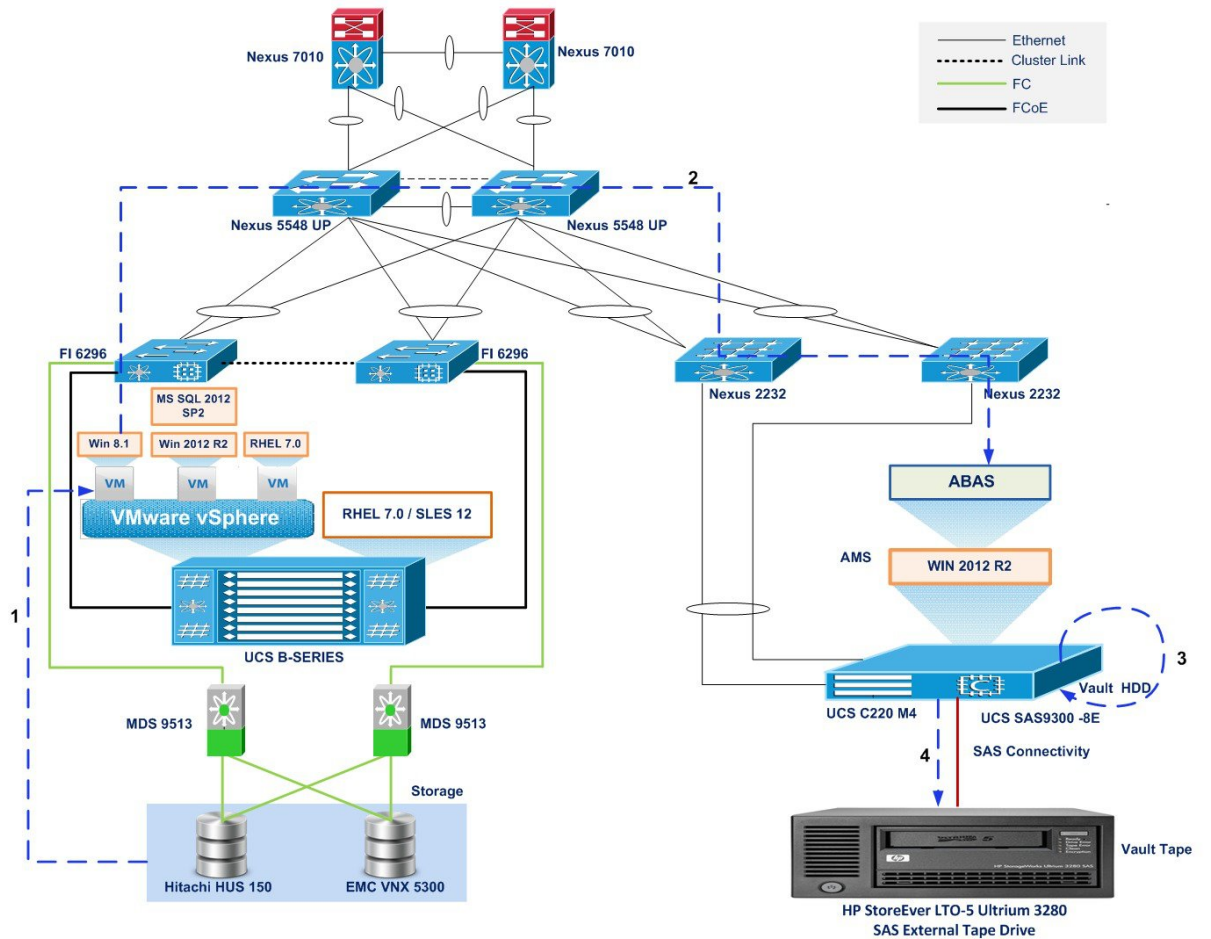
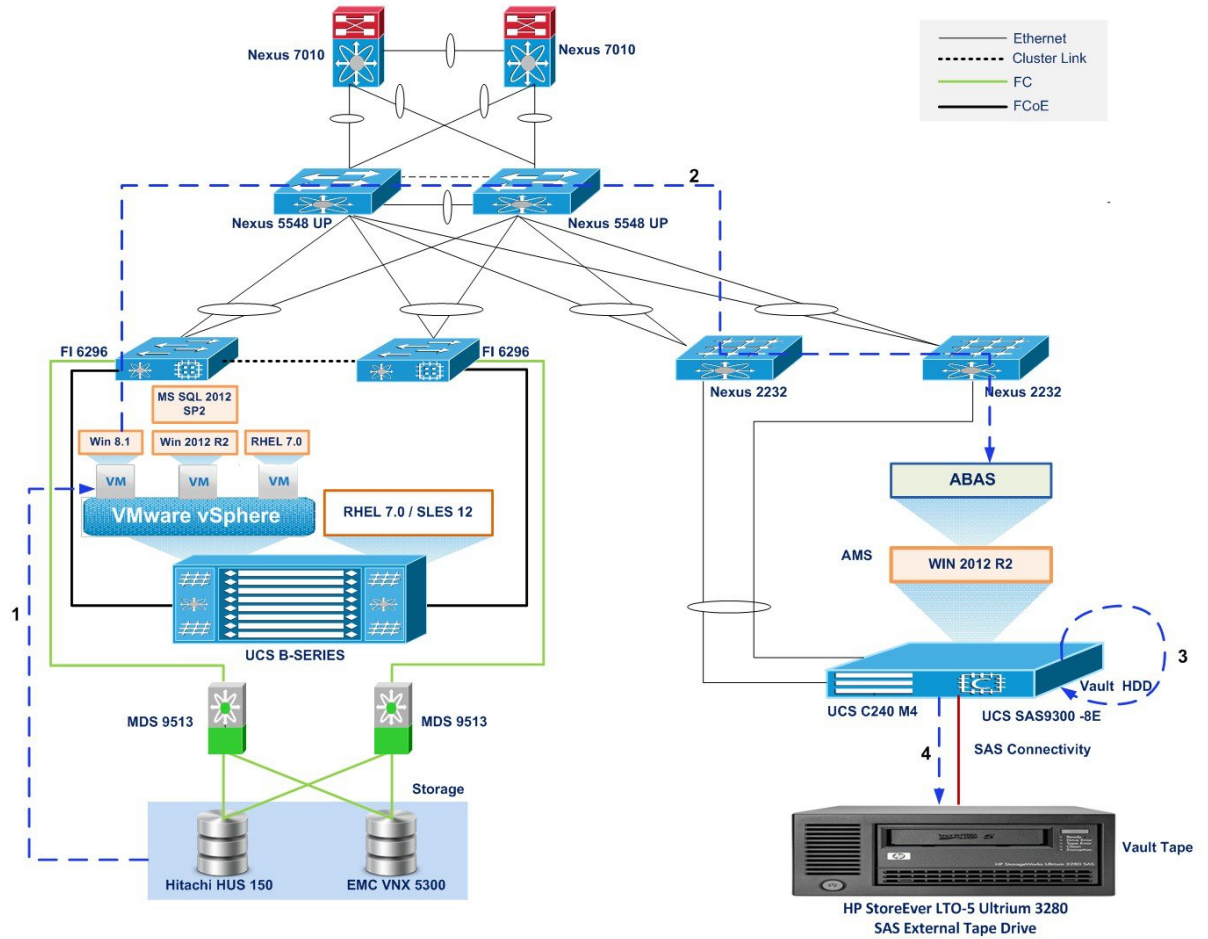


Figure 20: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-5 Ultrium 3280

Description

- Backup of data files (Word, PDF, and Excel) from Windows 8.1 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-5 Ultrium 3280 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-5 Ultrium 3280 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

Linux File / Folders Backup

Fig 21: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

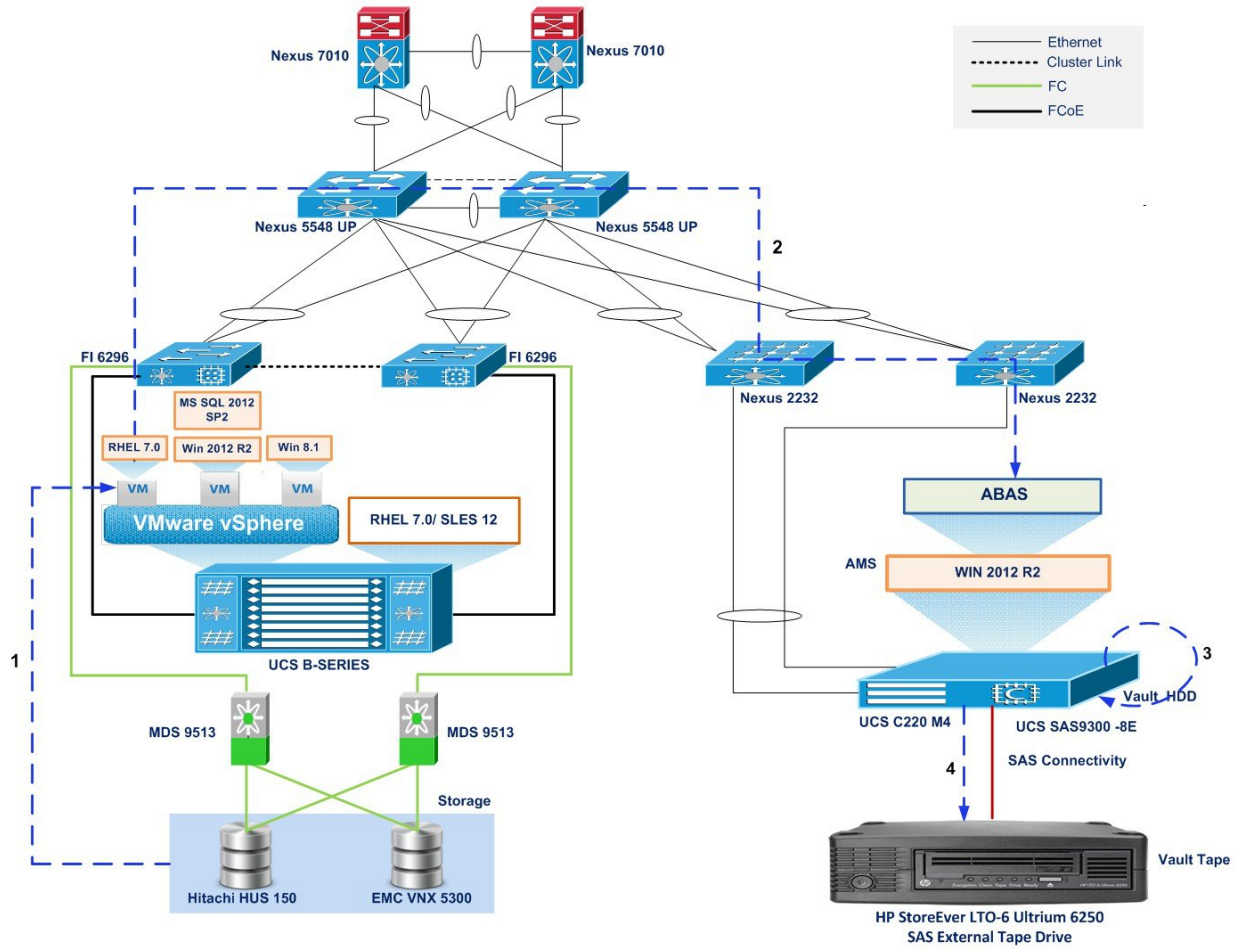
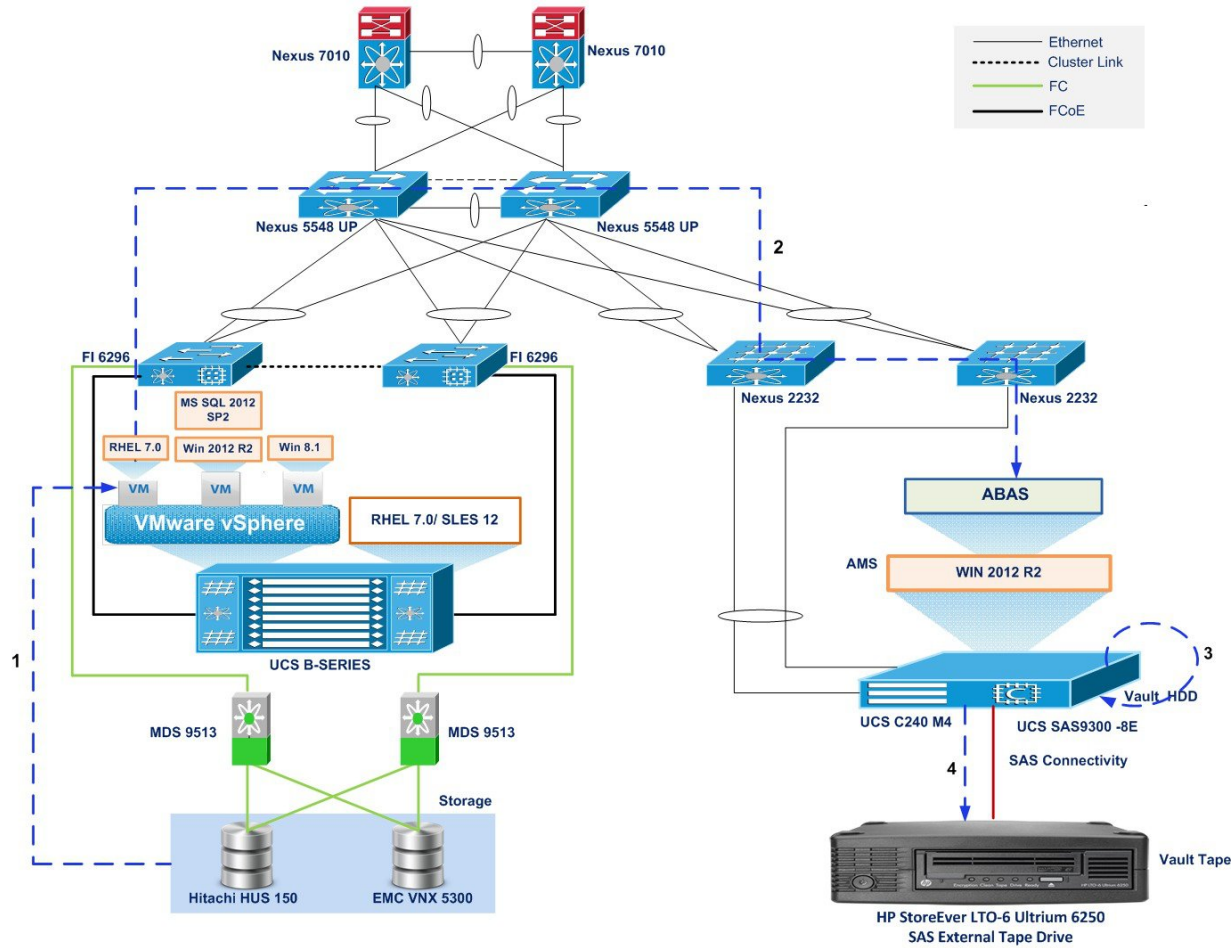


Fig 22: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6250

Description

- Backup of data files (Word, PDF, and Excel) from RHEL 7.0 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-6 Ultrium 6250 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-6 Ultrium 6250 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

Fig 23: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

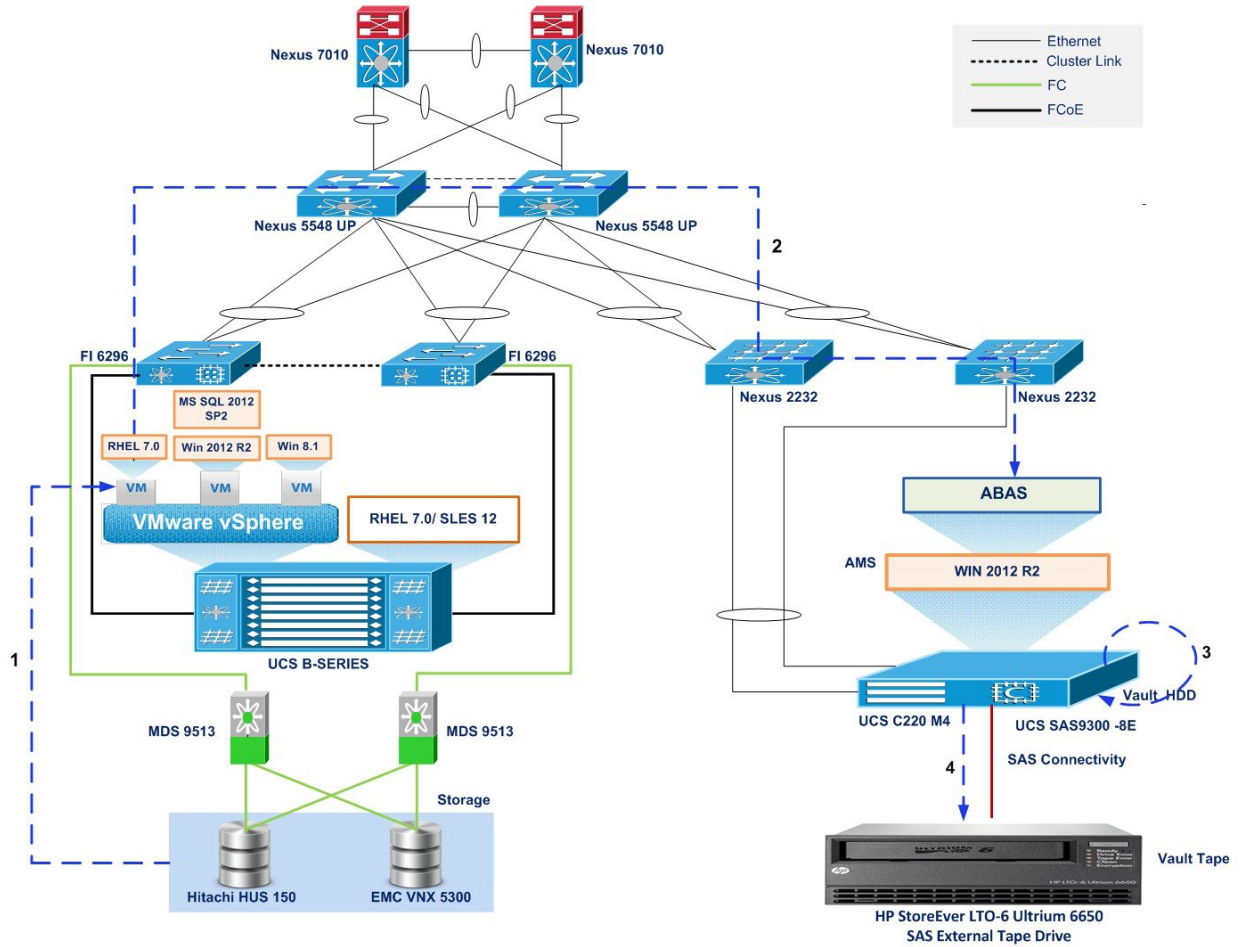
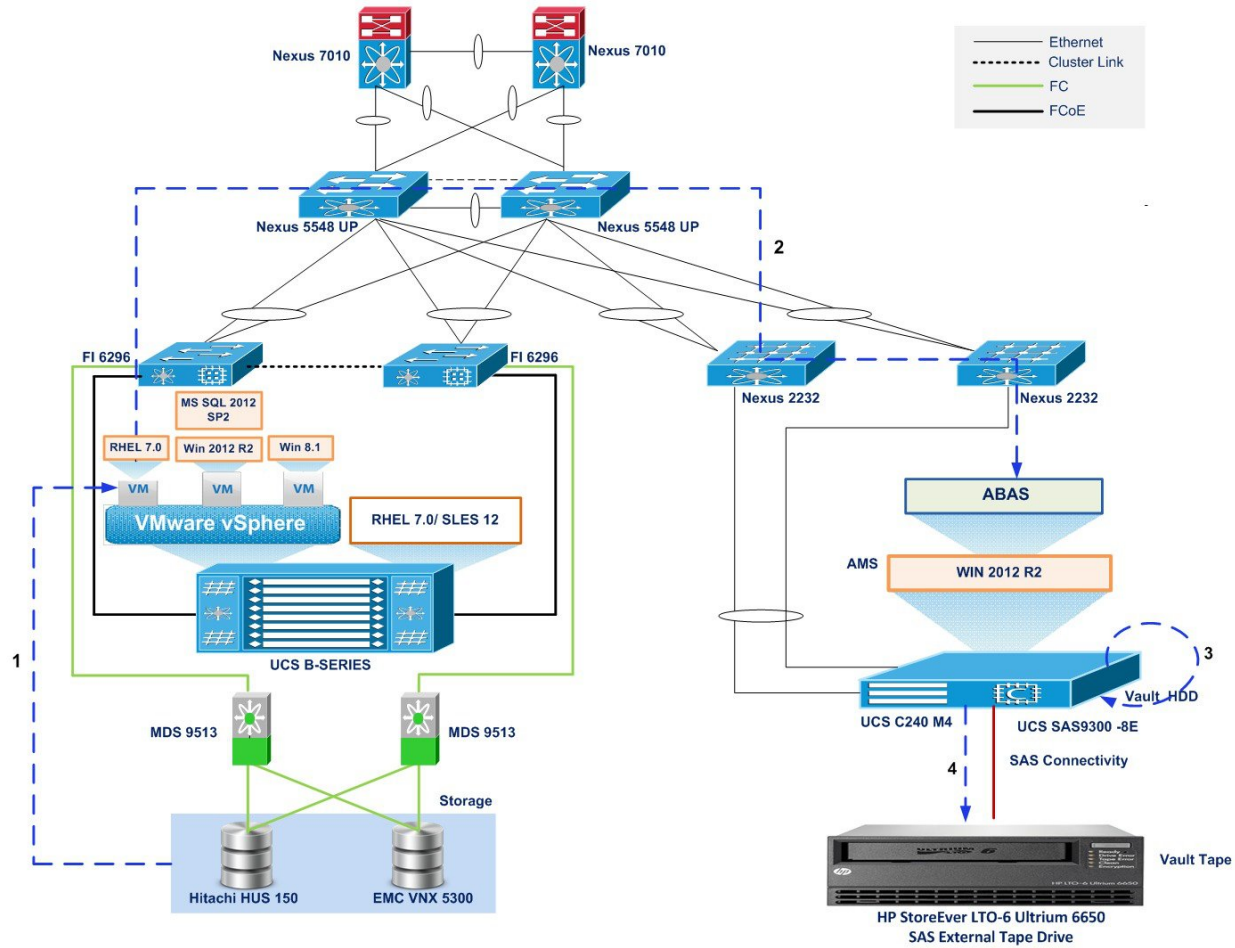


Fig 24: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6650

Description

- Backup of data files (Word, PDF, and Excel) from RHEL 7.0 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-6 Ultrium 6650 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-6 Ultrium 6650 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

Fig 25: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

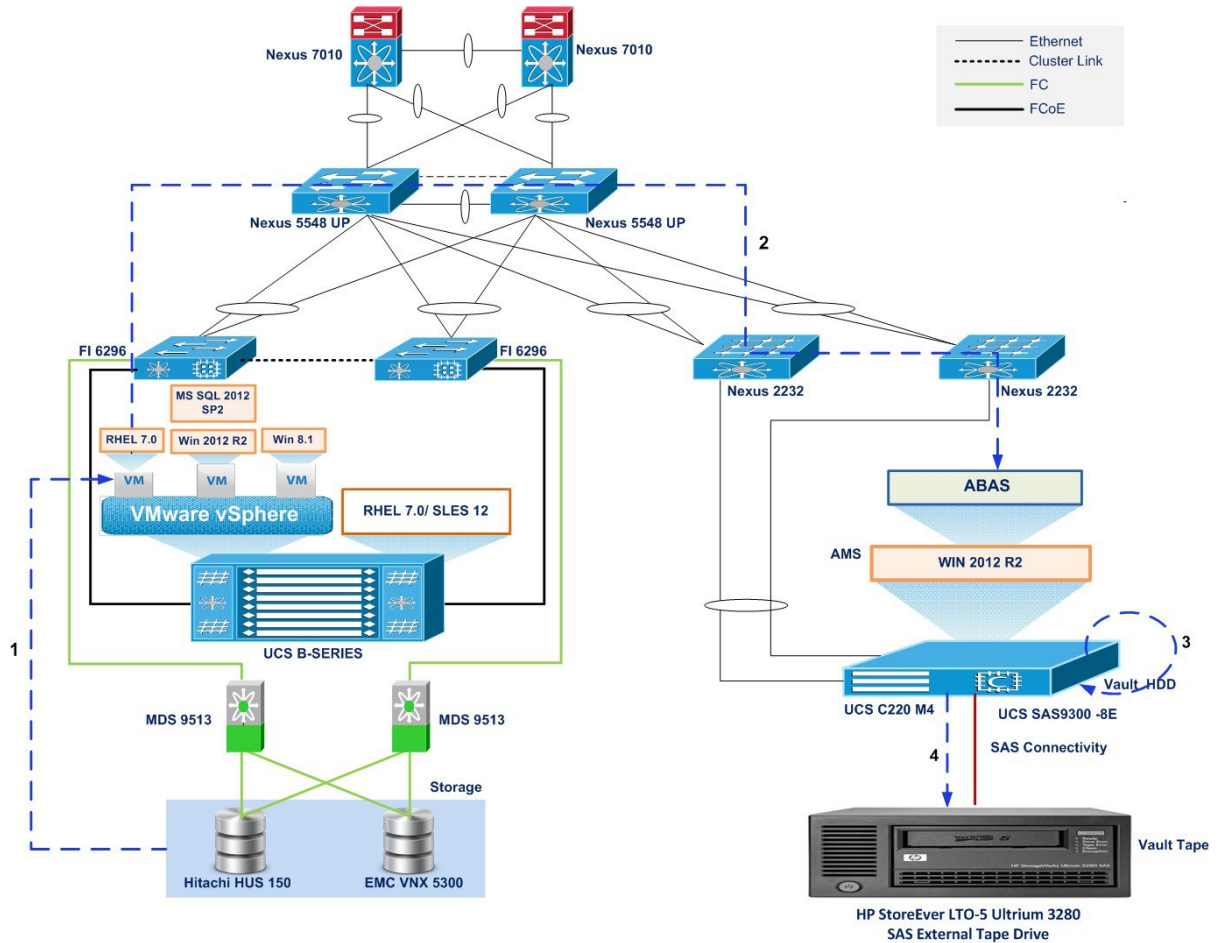
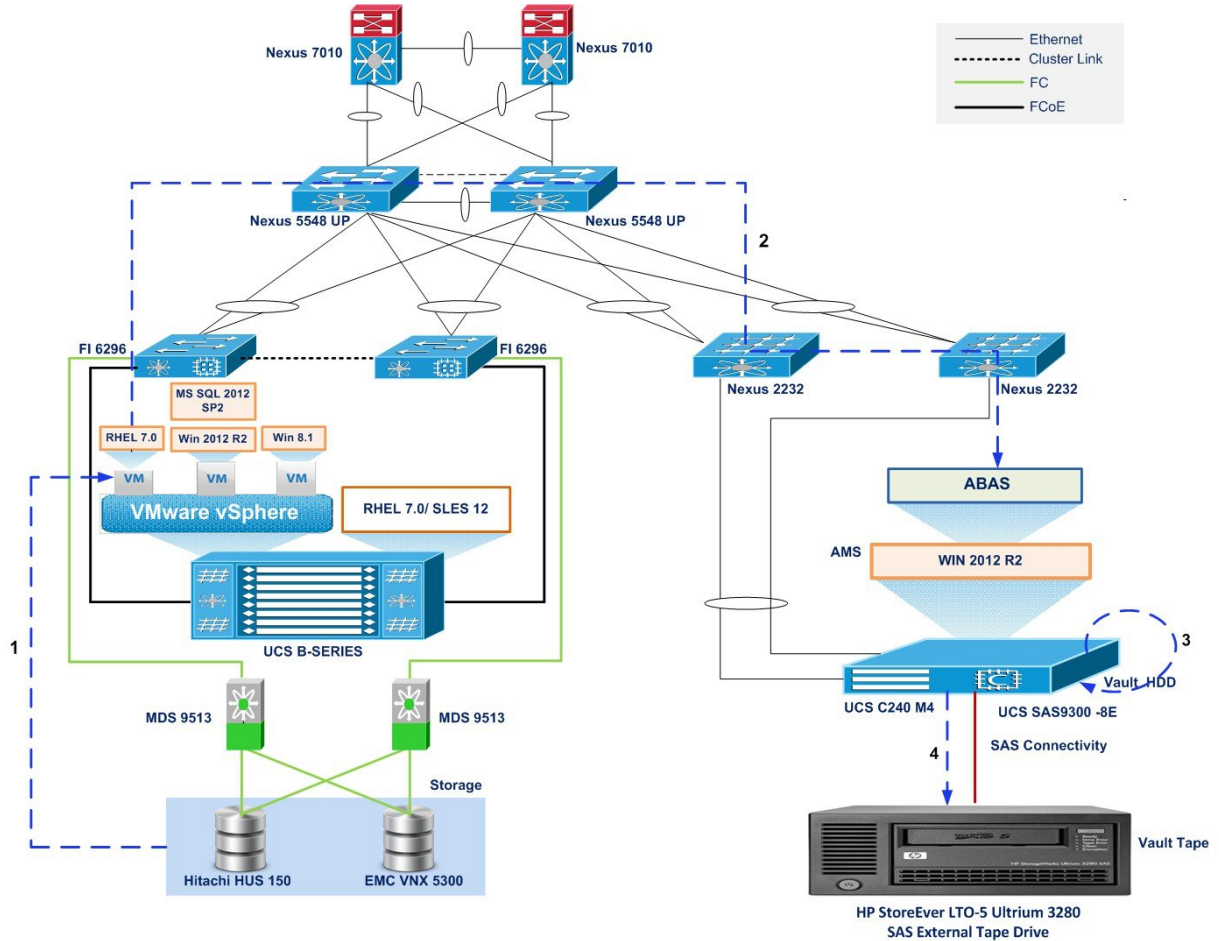


Fig 26: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-5 Ultrium 3280

Description

- Backup of data files (Word, PDF, and Excel) from RHEL 7.0 Japanese Operating System to C Series Server Local HDD and then Replicate the same to HP StoreEver LTO-5 Ultrium 3280 using Acronis Backup Advanced Suite 11.5 software.

- Recover the Files either from Local HDD or HP StoreEver LTO-5 Ultrium 3280 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software.

SQL Backup

Figure 27: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

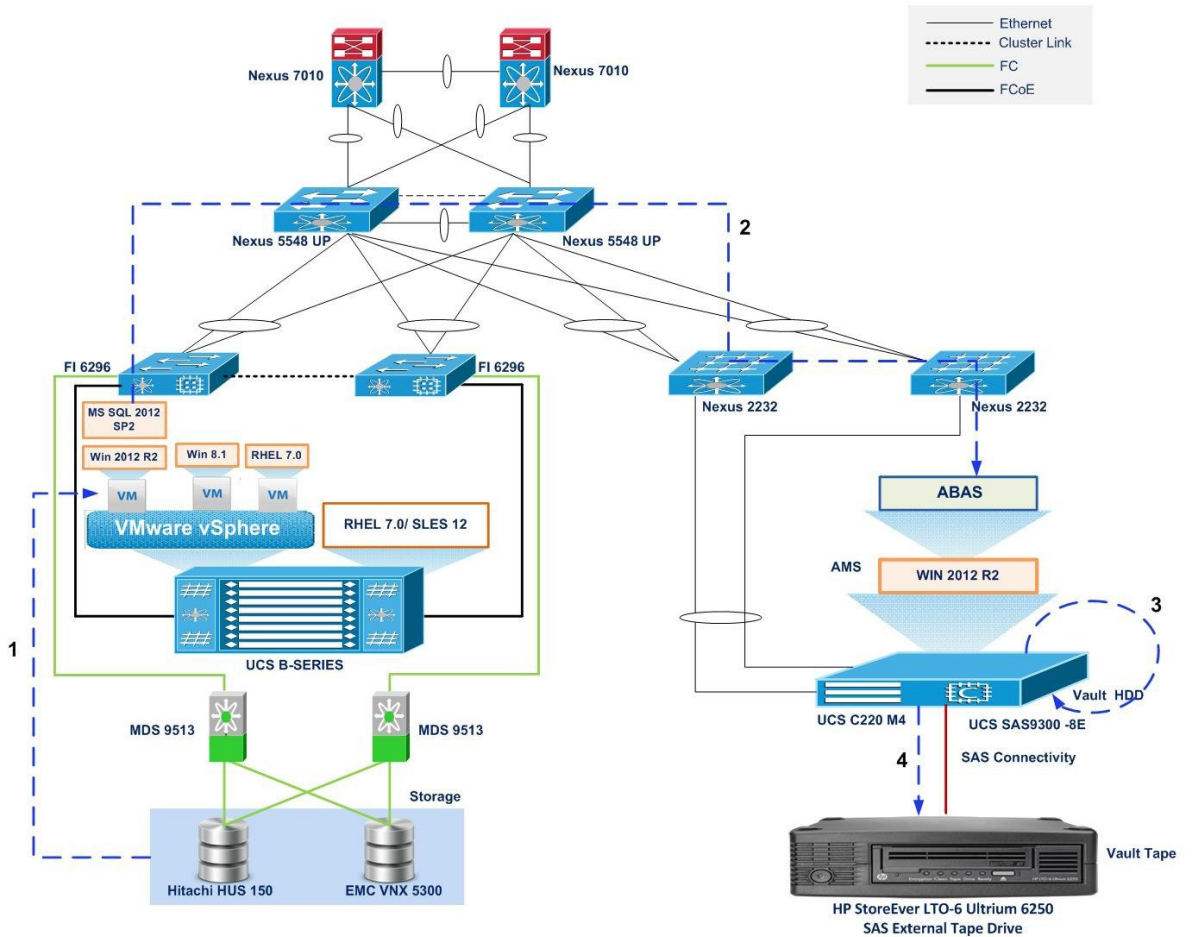
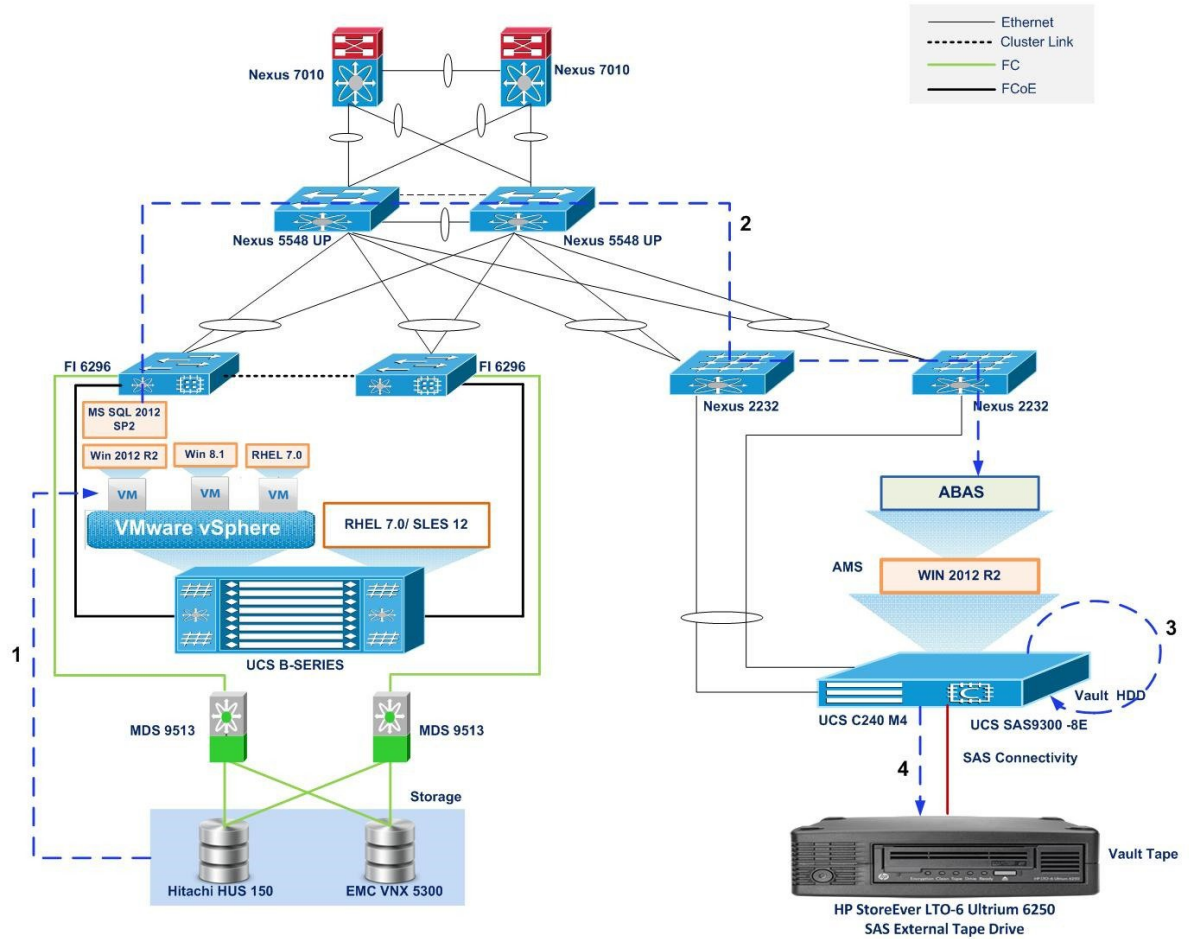


Figure 28: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6250

Description

- Backup SQL Database using Acronis Single-Pass Backup for taking the Database on Windows Server 2012 R2 to C Series Server Local HDD and then Replicate the Database to HP StoreEver LTO-6 Ultrium 6250

- Recover the Database either from Local HDD or HP StoreEver LTO-6 Ultrium 6250 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software

Figure 29: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

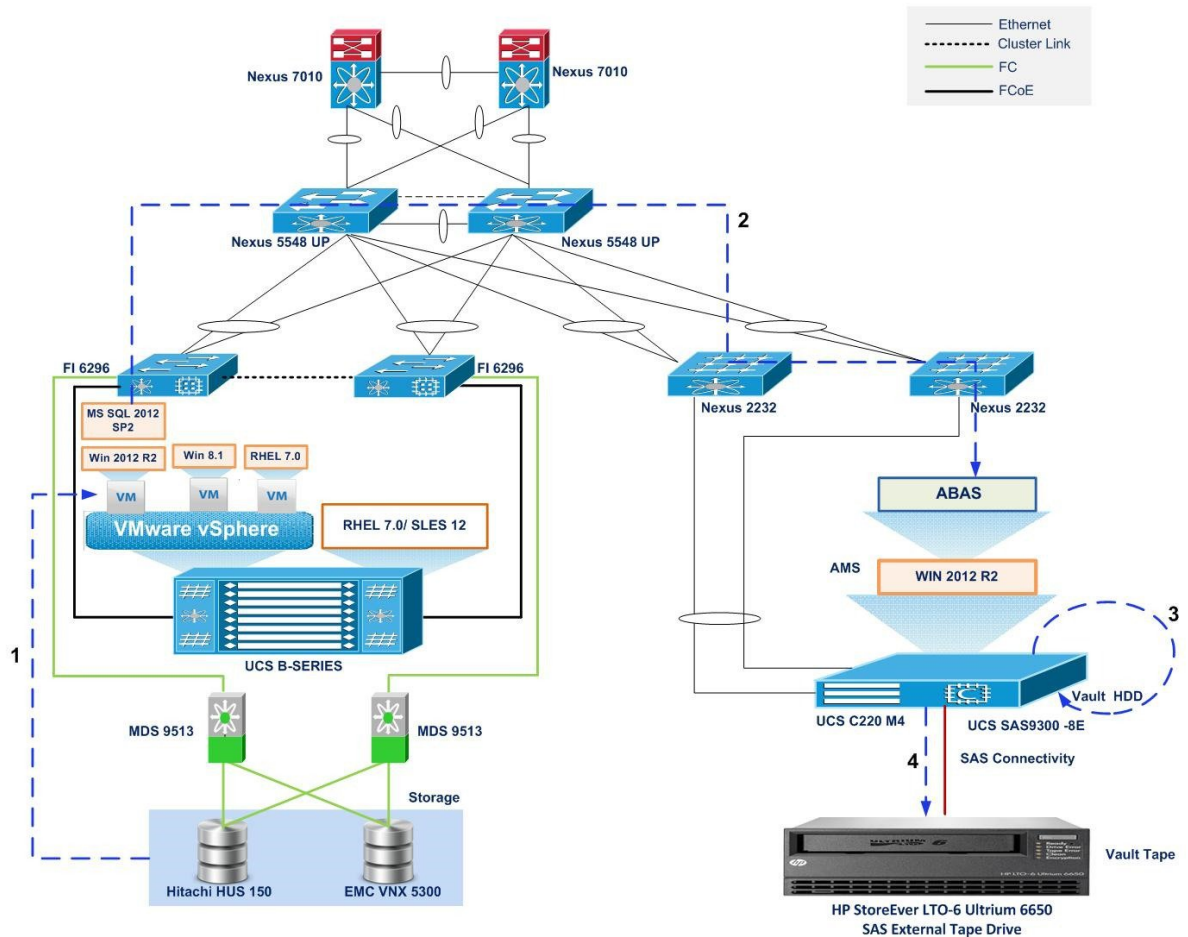
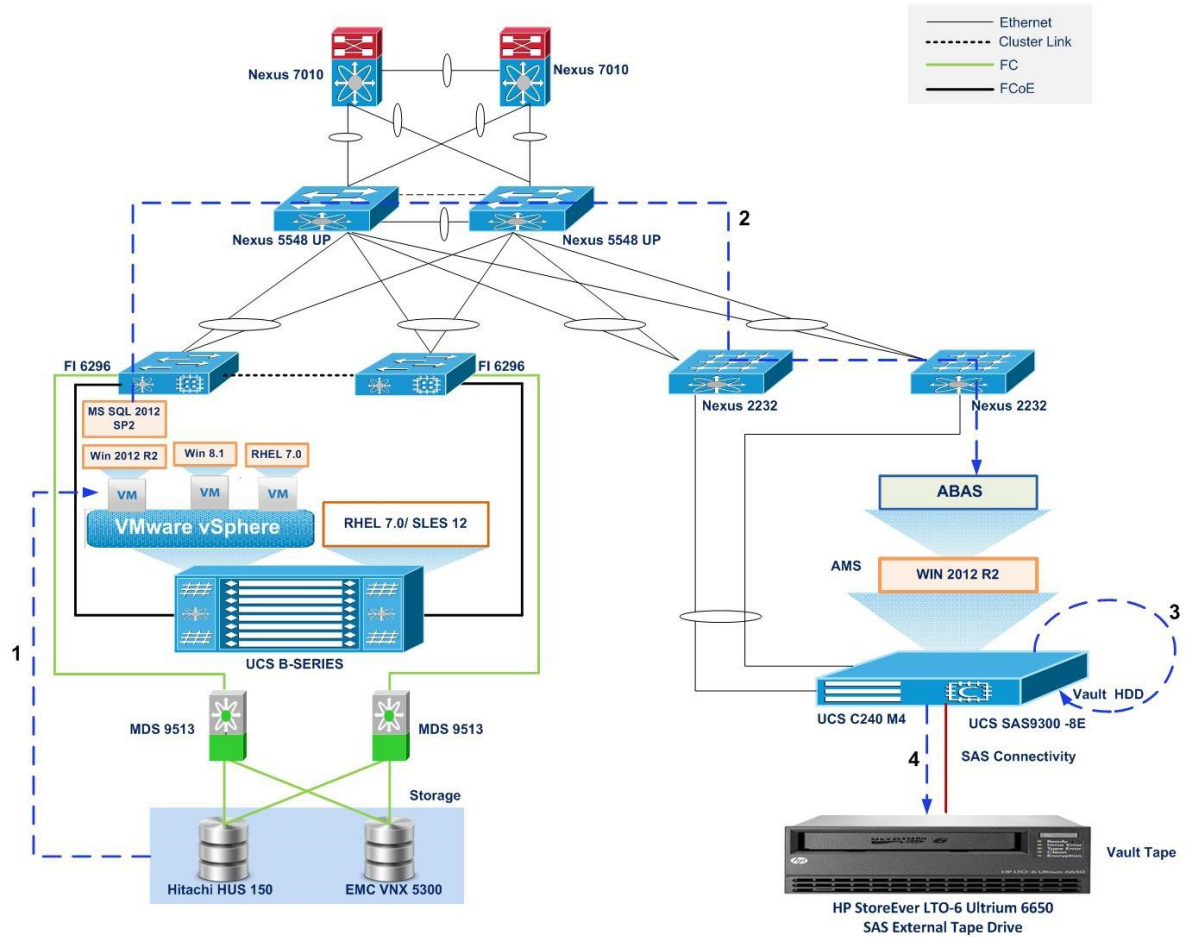


Figure 30: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-6 Ultrium 6650

Description

- Backup SQL Database using Acronis Single-Pass Backup for taking the Database on Windows Server 2012 R2 to C Series Server Local HDD and then Replicate the Database to HP StoreEver LTO-6 Ultrium 6650

- Recover the Database either from Local HDD or HP StoreEver LTO-6 Ultrium 6650 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software

Figure 31: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

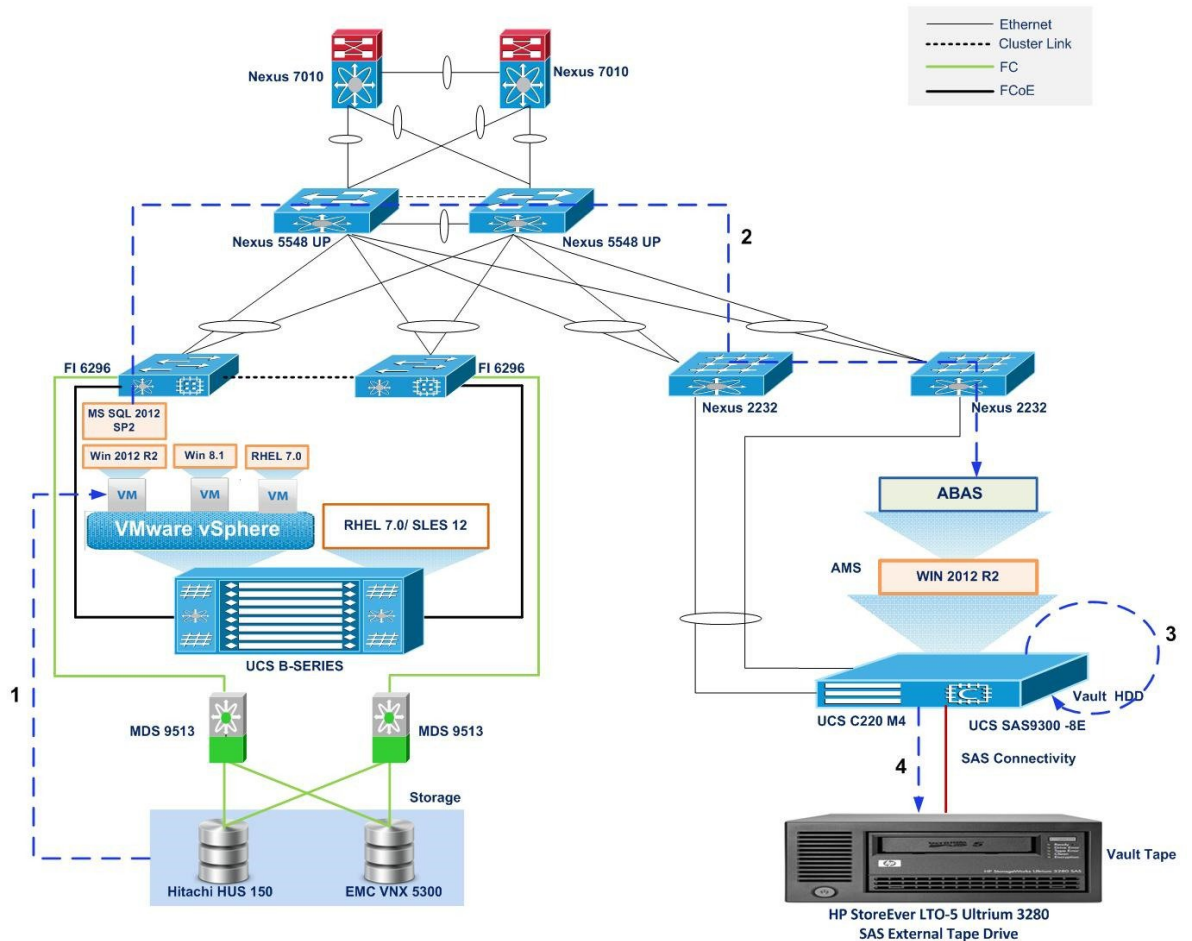
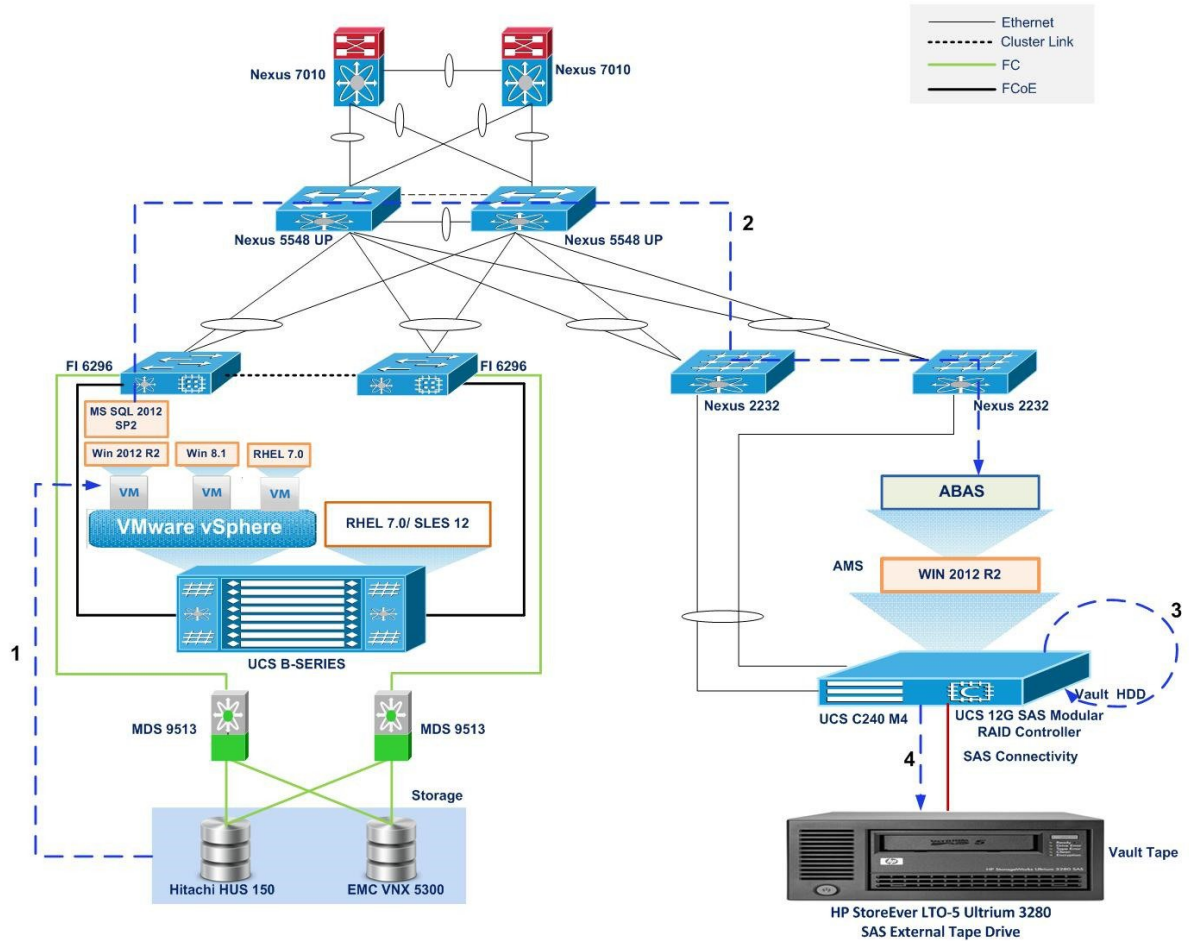


Figure 32: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Disk Array (Hitachi HUS & EMC VNX)	VM in B series SAN based server
2	VM in B series SAN based server (Backup client)	Acronis Management server
3	Acronis Management server	Backup Server Disk
4	Backup Server Disk	HP StoreEver LTO-5 Ultrium 3280

Description

- Backup SQL Database using Acronis Single-Pass Backup for taking the Database on Windows Server 2012 R2 to C Series Server Local HDD and then Replicate the Database to HP StoreEver LTO-5 Ultrium 3280

- Recover the Database either from Local HDD or HP StoreEver LTO-5 Ultrium 3280 by using various Recovery Options available on Acronis Backup Advanced Suite 11.5 Software

P2V

Figure 33: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive

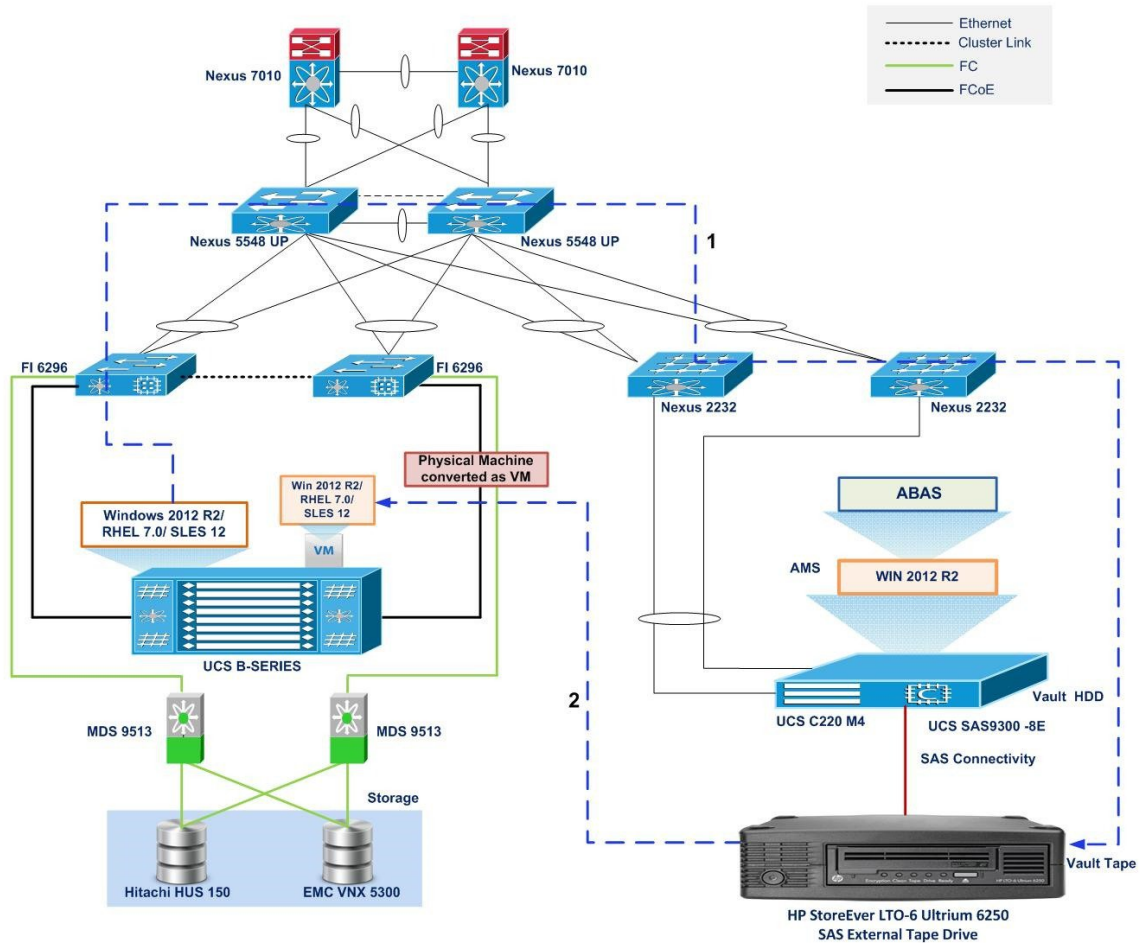
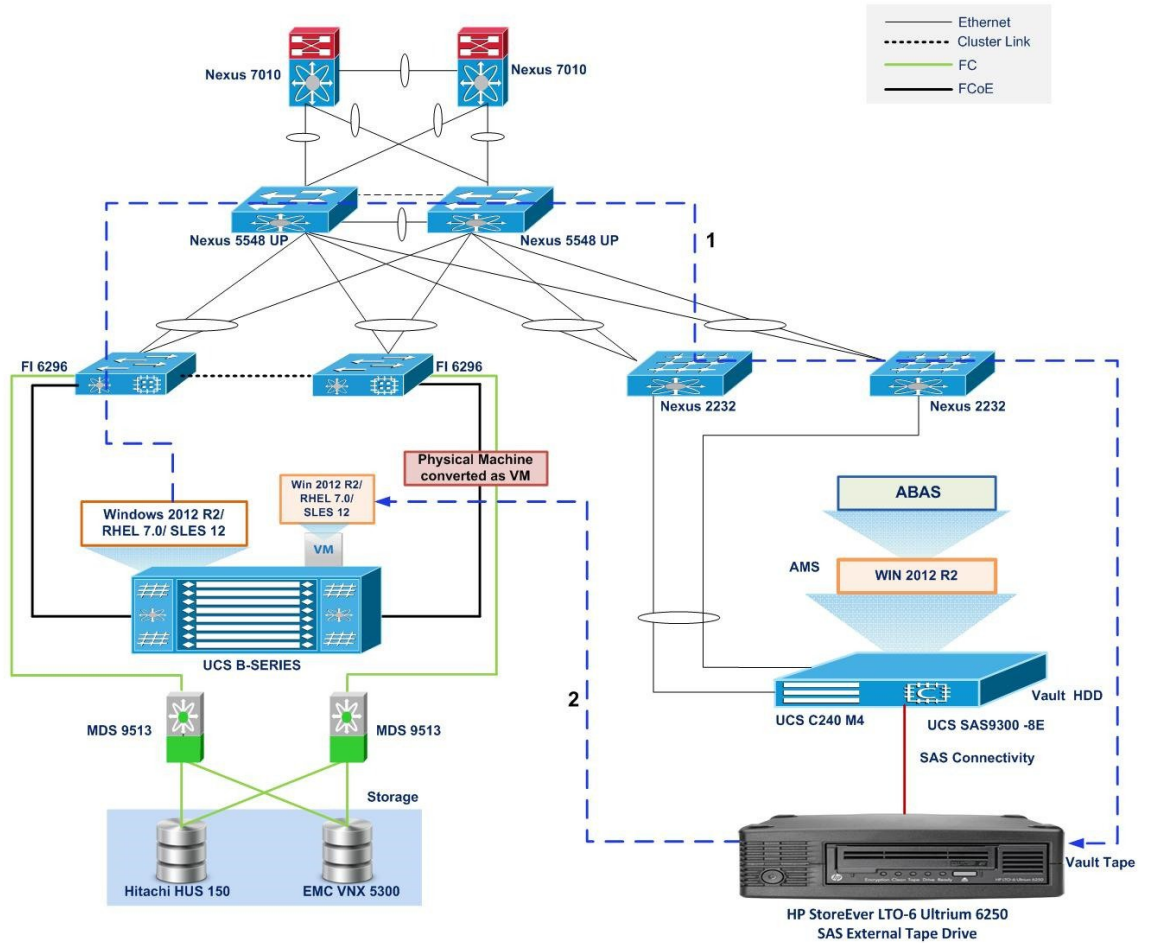


Figure 34: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6250 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Bare Metal Windows 2012 R2 server/ RHEL 7.0 server (Backup Client)	HP StoreEver LTO-6 Ultrium 6250
2	HP StoreEver LTO-6 Ultrium 6250	Converted as VM and Restored in an ESXi Host

Description

- Backup a physical server to HP StoreEver LTO-6 Ultrium 6250 and while restoring convert the same to Virtual machine using Acronis Backup Advanced Suite 11.5 Software.

Figure 35: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive

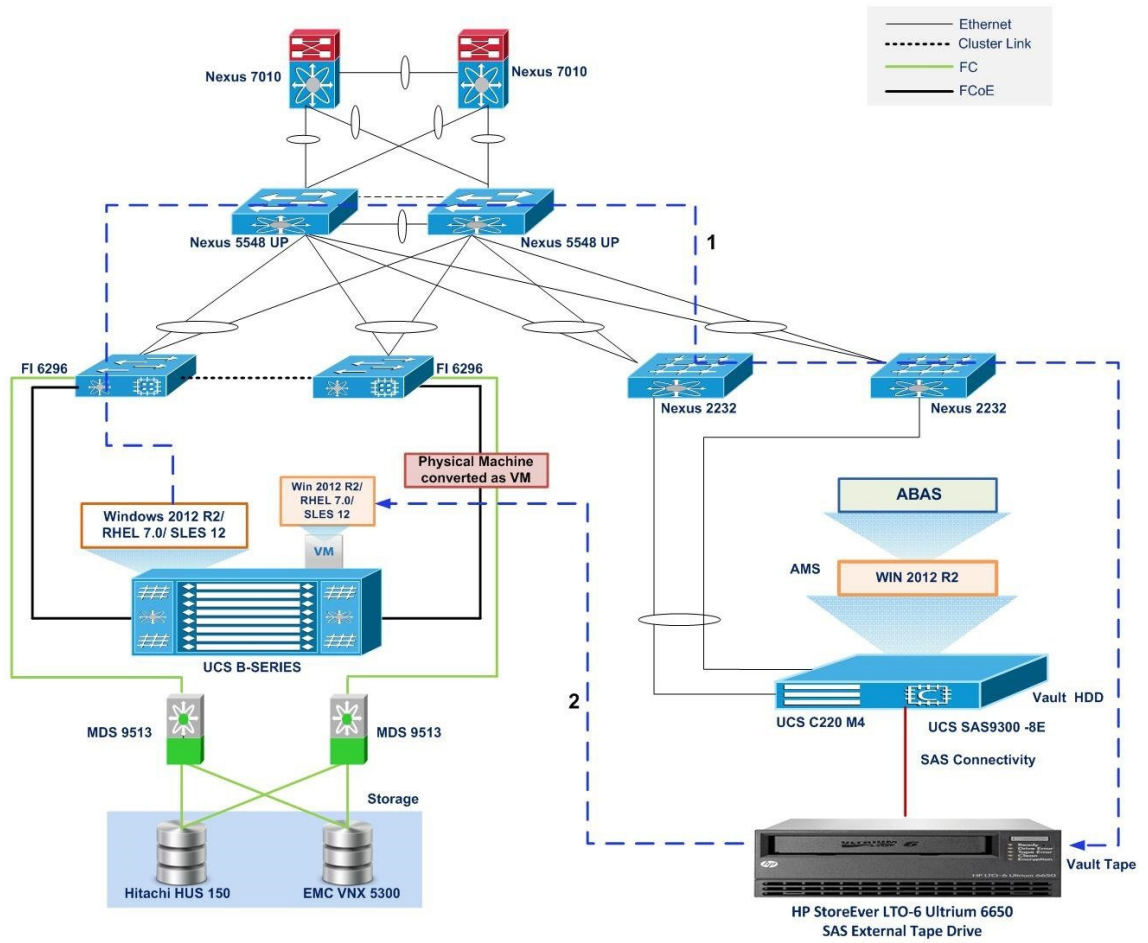
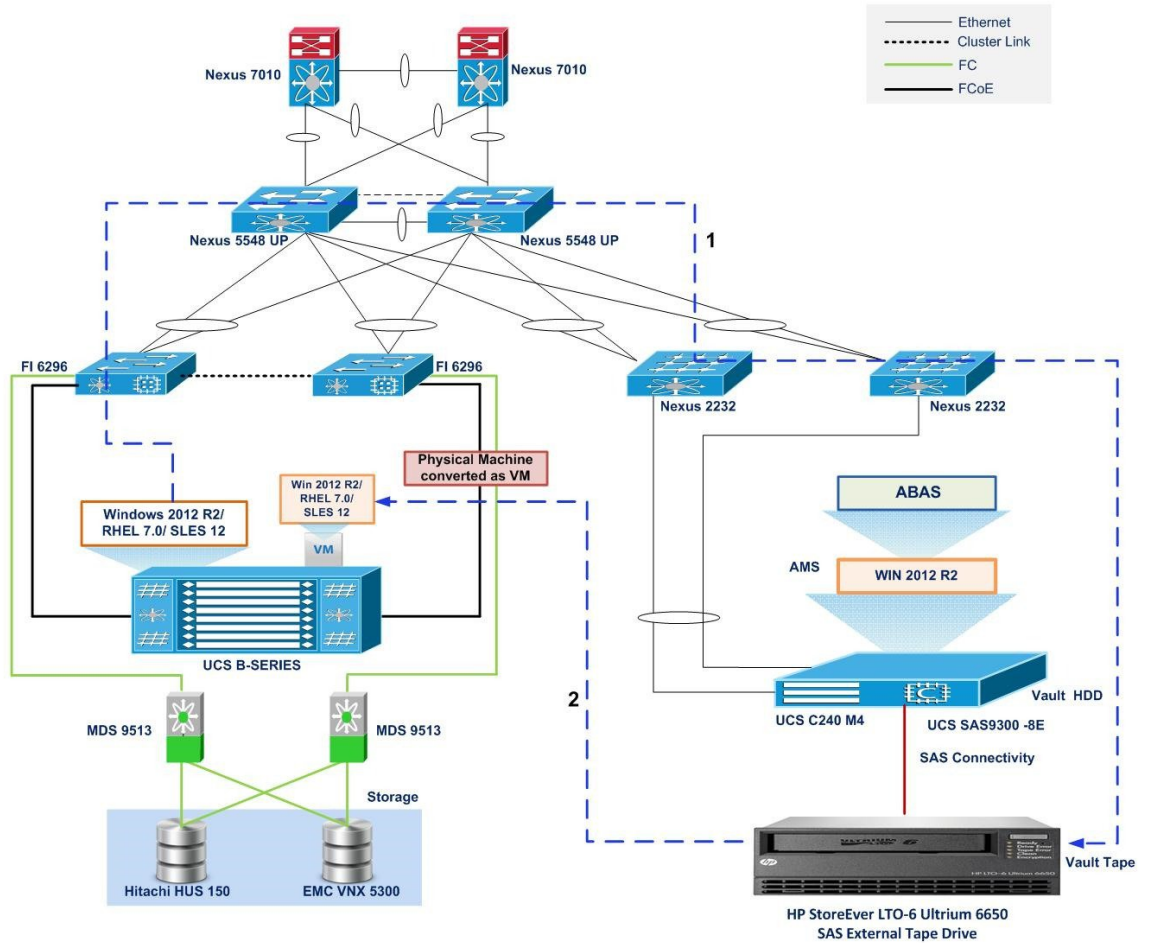


Figure 36: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-6 Ultrium 6650 as External Tape Drive



Backup Data Flows:

Step	From	To
1	Bare Metal Windows 2012 R2 server/ RHEL 7.0 server (Backup Client)	HP StoreEver LTO-6 Ultrium 6650
2	HP StoreEver LTO-6 Ultrium 6650	Converted as VM and Restored in an ESXi Host

Description

- Backup a physical server to HP StoreEver LTO-6 Ultrium 6650 and while restoring convert the same to Virtual machine using Acronis Backup Advanced Suite 11.5 Software.

Figure 37: Topology with UCS C220 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive

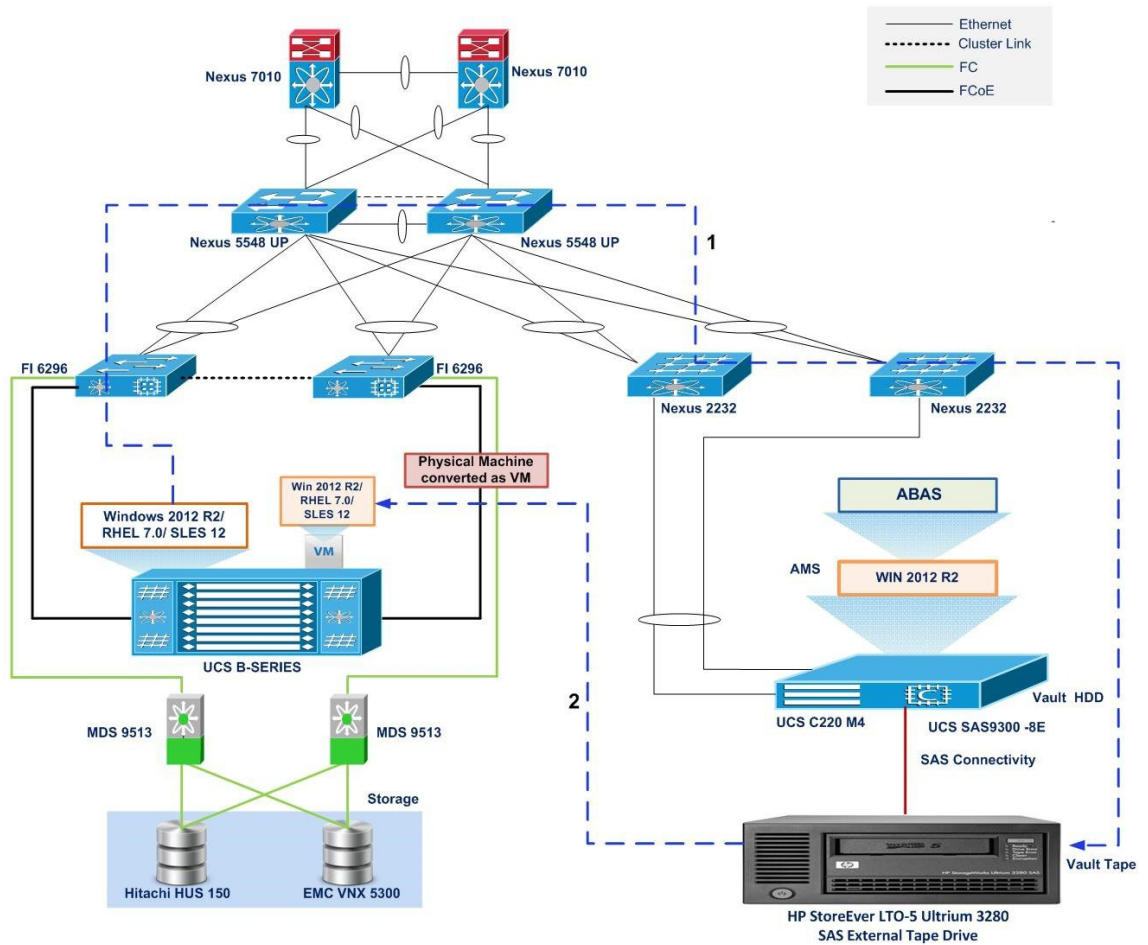
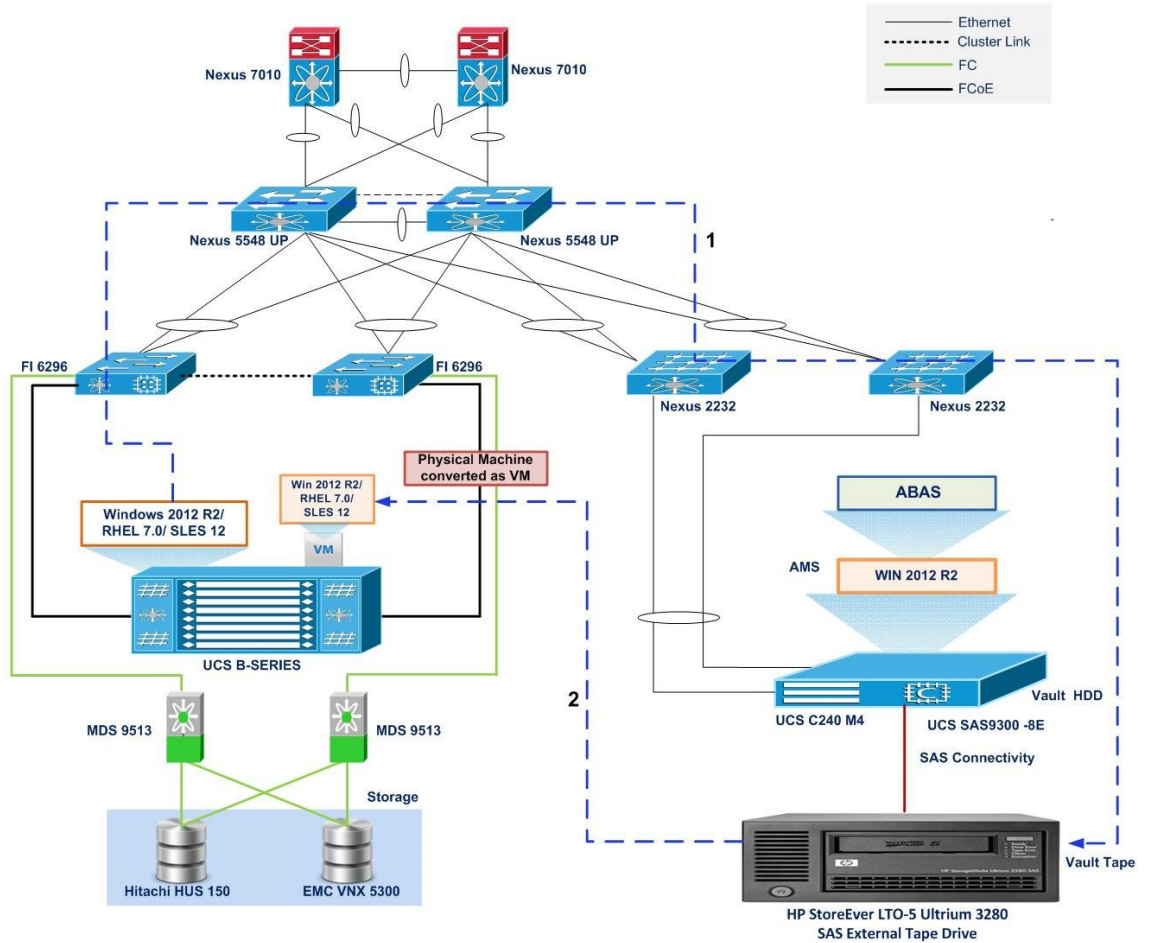


Figure 38: Topology with UCS C240 M4 as Backup Server and HP StoreEver LTO-5 Ultrium 3280 as External Tape Drive



Backup Data Flows:		
Step	From	To
1	Bare Metal Windows 2012 R2 server/ RHEL 7.0 server (Backup Client)	HP StoreEver LTO-5 Ultrium 3280
2	HP StoreEver LTO-5 Ultrium 3280	Converted as VM and Restored in an ESXi Host

Description

- Backup a physical server to HP StoreEver LTO-5 Ultrium 3280 and while restoring convert the same to Virtual machine using Acronis Backup Advanced Suite 11.5 Software.

V2P

Figure 39: Topology with Network Shared Location over UCS C220 M4 Server

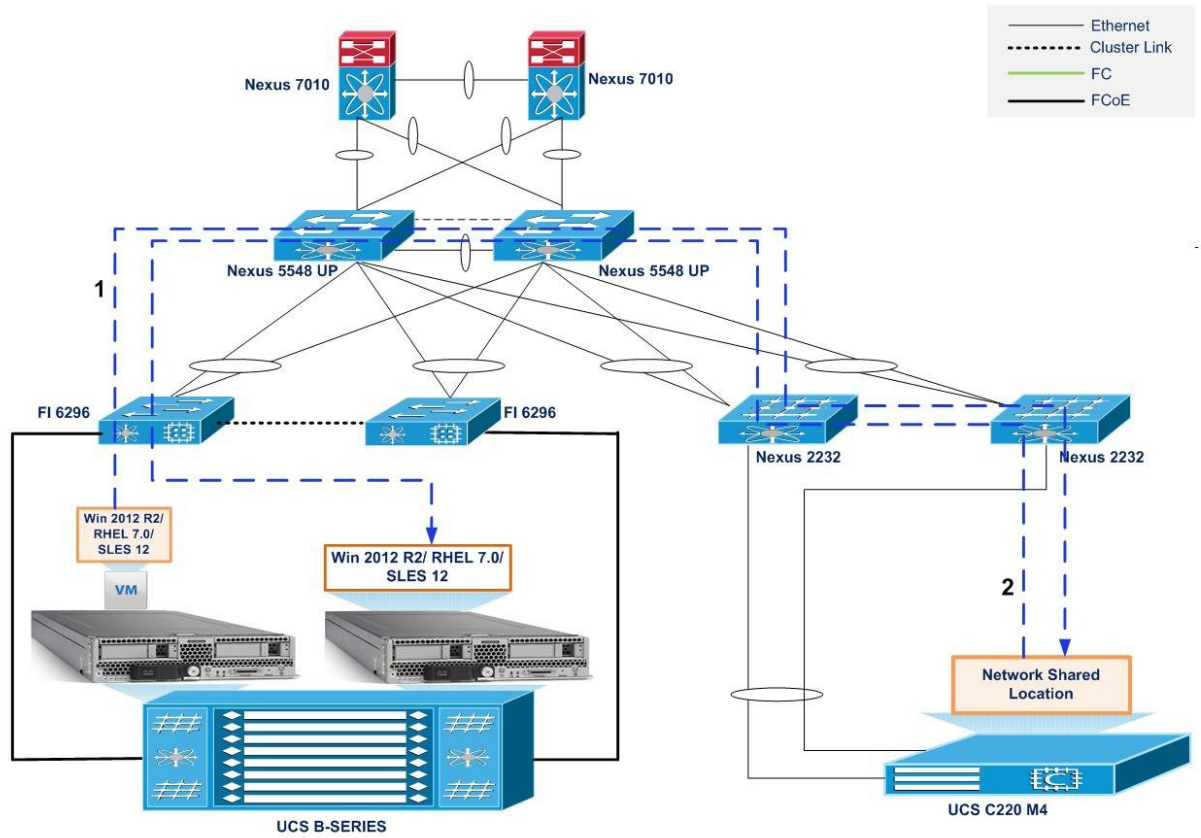
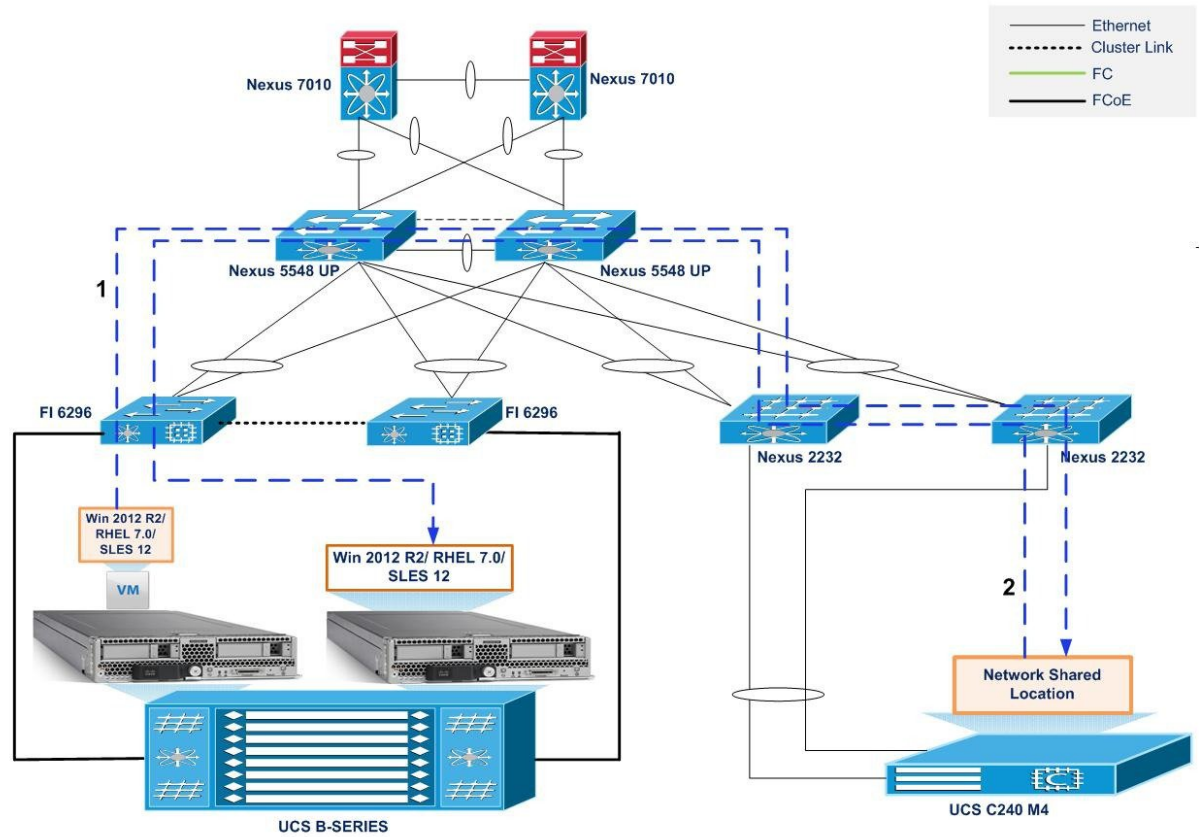


Figure 40: Topology with Network Shared Location over UCS C240 M4 Server



Backup Data Flows:		
Step	From	To
1	Disk Array	Network Share
2	Network Share	Converted as Physical Machine and Restored to B200 M4 baremetal.

Description

- Backup a Virtual Machine to Network share and while restoring convert the same to Physical machine on B200 M4 server baremetal using Acronis Backup Advanced Suite 11.5 Software.

Issues

ABR-62504

Physical to virtual conversion of SLES 12 failed.

Related Documentation

Cisco Servers -Unified Computing

<http://www.cisco.com/en/US/products/ps10265/index.html>

UCS SAS9300 -8E

<http://www.lsi.com/products/host-bus-adapters/pages/lsi-sas-9300-8e.aspx>

Acronis Backup & Recovery 11.5 Advanced Version for Windows

<http://www.acronis.com/en-us/business/backup/windows-server/>

Acronis Backup & Recovery 11.5 Advanced Version for Linux

<http://www.acronis.com/en-us/business/backup/linux-server/>

Acronis Backup & Recovery 11.5 Advanced Version for VMware

<http://www.acronis.com/en-us/business/backup/virtual-machine/>